
Graduate Courses of Instruction

Course of Instruction

Courses numbered: 400-499

—Open to graduate students and to qualified undergraduates. [I.E. These are Graduate Classes that are open to qualified undergraduates with departmental permission]

Courses numbered: 500 and above

—Open to graduate students only

Student experience may suggest exceptions are warranted. In those instances, students should consult with their advisors. Deans have authority to approve exceptions.

Some graduate courses are offered every year, but many are scheduled over a two-year or three-year cycle. It is, therefore, essential that graduate students should carefully plan entire programs with their graduate advisors so that they will be able to register for all required courses over the time span in which they expect to complete the degree. The University reserves the right to limit the number of students registered in any graduate course, and also the right to cancel any course for which there is insufficient enrollment.

Accounting

ACCOUNTING 400

Financial Accounting

This course is an introduction to American financial accounting principles based on FASB and IASB, including the measurement, processing, and communication of accounting information. Users of such accounting information include business owners, managers, creditors, prospective investors, and others interested in the financial condition of an entity and the results of its operations. Topics covered include the accounting cycle, merchandising, services, fixed assets and corporate accounting issues. Prerequisite: Admission to graduate study.

3 semester credits

ACCOUNTING 500

Accounting, Business Law & Ethics

The course focuses the fundamentals of Accounting, and also, how the legal and ethical environment of business impacts business decisions. There is an introduction to the basic principles of Accounting: how to account for business transactions. Emphasis on the understanding of how financial statements are prepared, and how they are used as a basis for decision making by business owners, and others interested in the financial condition of an economic entity and the results of its operations. The Law component introduces how the legal

Accounting

environment of business impacts business decisions with broad ethical, and critical thinking examples throughout. Knowledge of the legal aspects of running a business will enable the student to conduct business within the legal framework and understand the ethical dimension of business decisions. Topics include: Introduction to Business Ethics; Financial Regulation (Sarbanes-Oxley, Dodd-Frank) Business Crimes, Torts, and Contracts; the Constitution and Government Regulation of Business; Business Organizations; Employment and Labor Laws; Consumer Protection and Environmental Regulation; and Ethical Conflicts including Corporate Loyalty v. Whistleblowing, and Privacy and Technology. Broad ethical critical thinking will be examined using legal cases, decisions, essays and articles.

3 semester credits

ACCOUNTING 505

Managerial and Cost Accounting

This course provides an introduction to managerial and cost accounting used by management in conducting daily operations, planning future operations, and developing overall business strategies. The objective is to gain an understanding of the role of accounting in the management process of planning, directing, controlling, and improving the organization's objectives (goals) and to translate those objectives into a course of action. Prerequisites: ACCT 400 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

ACCOUNTING 510

Intermediate Accounting

This course applies generally accepted accounting principles to the preparation of financial statements, including balance sheets, income statements, statement of cash flows, and retained earnings statements. Accounting for leases, employee benefits, deferred taxes and other specialized accounting topics will also be explored. Prerequisites: ACCT 400 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

ACCOUNTING 520

Auditing

This course examines laws and methods for conducting commercial audits. Ethics, attestation standards, controls and fraud detection are among the topics that will be discussed. Application of generally accepted accounting practices to the review of financial statements, as well as the responsibility of the certified public accountant to the various users of the statements

will also be explored. Prerequisites: ACCT 400, ACCT 510 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

ACCOUNTING 530

Personal Taxation

This course is an overview of the major types of personal taxes used by governments to raise revenue. Emphasis is placed on the taxation of individuals and tax planning considerations for the individual. Prerequisites: ACCT 400 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

ACCOUNTING 535

Business Entity Taxation

This course is an overview of the major types of corporate and business entity taxes used by governments to raise revenue. An emphasis is placed on the tax issues of different business forms, tax management and tax planning considerations for the business entity. Prerequisites: ACCT 400, ACCT 530 and completion of all required Accounting concentration courses or concurrent registration in final required concentration courses.

3 semester credits

ACCOUNTING 540

Advanced Financial Accounting

This course is an overview of selected accounting topics of interest to international business students. Topics include current practice in accounting for business mergers or acquisitions, accounting for stock investments in affiliated companies, an introduction to consolidated financial statements, accounting for branch operations and an introduction to accounting for state and local governmental units. Prerequisites: ACCT 400, 510 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

ACCOUNTING 545

Financial Reporting and Analysis

This course is an overview of generally accepted accounting principles underlying the content of financial statements including alternative inventory valuation methods, lease accounting, segment reporting and reporting for employee benefit plans. Students study and analyze corporate annual reports and government and not-for-profit financial statements. Prerequisites: ACCT 400, ACCT 510, ACCT 540 and completion of all required accounting concentration courses or concurrent registration in final required concentration courses.

3 semester credits

Accounting • Acupuncture

ACCOUNTING 555

Advanced Auditing

This course provides understanding of laws and methods for conducting audits. It includes reviewing the engagement to provide reasonable assurance the audit objectives are achieved. It also includes evaluation of information obtained to reach and to document engagement conclusions including: performing analytical procedures, evaluating the sufficiency and competence of audit evidence and document engagement conclusions, and reviewing the work performed to provide reasonable assurance the objectives are achieved. It also develops proficiency in preparing communications to satisfy engagement objectives including: preparing reports, preparing letters and other required communications, and other related matters. The course prepares students to pass the CPA exam and to do professional audits. Prerequisite: Undergraduate degree and approval of the State of Connecticut to take the CPA exam. Offered Annually

3 semester hours

ACCOUNTING 556

Accounting Regulations

This course provides the required knowledge for accountants in federal taxation and business law. The curriculum provides a working knowledge of federal taxation of individuals, corporations, partnerships, estates and trusts. It covers the concepts of business law, debtor-creditor relationships, government securities acts, employment regulations and environmental regulations. It also provides knowledge of professional and legal responsibilities including professional conduct of accountants. The course curriculum includes all of the CPA exam materials. Prerequisite: Undergraduate degree and accounting courses to qualify to sit for the CPA exam. Offered Annually

3 semester hours

ACCOUNTING 557

Business Environment & Concepts for Accountants

This course will provide current knowledge in the business environment as it relates to the accounting profession. By the end of the course the student should have professional competency in corporate governances, economic concepts and analysis, financial management, information systems and communications, strategic planning and operations management.

3 semester hours

ACCOUNTING 558

Financial Accounting & Reporting

This course provides an in-depth overview of

selected advanced accounting topics required in the accounting profession. By the end of the course, the student should have professional competency in performing accounting work related to the four financial statements: balance sheet, income statement, equity statement, and statement of cash flows. In addition, the course will address the issues of partnerships, business combinations, governmental accounting, and non-profit accounting.

3 semester hours

ACCOUNTING 560

International Accounting

This course examines the diverse accounting practices employed by different countries and their effects on multi-national firms' operation, as well as efforts to standardize IASB/FASB rules. Performance evaluation in multi-national enterprises, impact of differences in national accounting principles and practices, and accounting under central planning is also examined. Discussion topics include the critical problem areas such as taxation, transfer pricing, financial planning, and information systems within an international framework. Prerequisites for Accounting: ACCT 400 and completion of all required accounting concentration courses or concurrent registration in final required concentration courses. Prerequisites for International Business: ACCT 400 and completion of all core courses or concurrent registration in final required core courses.

3 semester credits

Acupuncture

Acupuncture Practice and Techniques (APT)

APT 511

Point Location 1

This course will serve as the foundation of the acupuncture point selection series. Meridian theory using concepts of the Jing Luo system, including main and secondary vessels will be reinforced. This course provides the student with the knowledge and skills to physically locate acupuncture points of the lung, large intestine, stomach and spleen, heart and small intestine, urinary bladder, kidney, and pericardium channels. Students will focus on how to locate points effectively, accurately, and quickly as preparation for clinical application as well as college and national examinations. Students will also learn the major function(s) and indication(s) of the Lung, Large Intestine,

Stomach, Spleen, Heart, Small Intestine, Urinary Bladder, Kidney and Pericardium channel points. Co-requisite/Prerequisite: ATD 513 TCM Diagnosis 1, ABS 511 Anatomy 1.

1.5 lecture hours, 1 laboratory hour, 2 semester credits.

Offered: Fall and summer semesters

APT 523

Point Location II

This is a continuation of the previous course and will focus on the Triple Warmer, Gall Bladder, Liver, Governing Vessel ("Du"), Conception Vessel ("Ren") and extra points. Additional instruction is given in regional point selection and point combinations. Prerequisites: ATD 513 TCM Diagnosis 1, ABS 511 Anatomy 1.

1.5 lecture hours, 1 laboratory hour, 2 semester credits.

Offered: Spring and summer semesters

APT 512

Meridian Theory

Meridian (a.k.a. Channel) theory is the basis of diagnosis and acupuncture treatment. This course is designed to provide the necessary instruction and training for the student to be familiar with meridian theory including regular, extra and other meridian systems. Corequisite/Prerequisites: ATD 512 TCM Theory and ATD 513 TCM Diagnosis 1.

2 lecture hours, 2 semester credits.

Offered: Fall and summer semesters

AWB 501

UBAI Clinic Safety Procedures

This course prepares the student for being able to perform in the UBAI clinic. HIPAA, Occupational Safety and Health Administration (OSHA) standards, UBAI clinic specific safety practices and procedures are presented. The student will practice safe and proper needle removal, pole moxibustion, and electrical stimulation needle techniques. The student will be shown and will practice clinic room set and clean-up procedures and patient draping. A review of fire safety and personal safety procedures will be offered. Completion of this course and passing the clinic HIPAA and OSHA BBP quizzes is required before performing any duties in the UBAI clinic. Prerequisites: none.

0.5 lecture hours, 0.5 semester credits.

Offered Fall and Spring semesters.

AWB 521

TCM Safe Practices

This course prepares the student for emergency situations both in and out of the office. CCAOM Clean Needle Technique and a review of Occupational Safety and Health Administra-

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tion (OSHA) standards are presented. In addition the student will practice safe and proper needling, moxibustion, bleeding, electrical stimulation and cupping techniques. Allopathic treatments along with natural remedies for common complications of acupuncture and related therapies are discussed. CPR certification in emergency procedures is achieved. Prerequisites: none.

1.5 lecture hours, 1.5 semester credits.

Offered: Spring and summer semesters

APT 614

Acupuncture Techniques I

This course covers the basic principles of acupuncture treatment for diseases involved with different pathogenic factors, tissues and organs. Special point selection based on Root-Branch, Origin-End, Path of Qi, Five Element and Eight Parameter diagnoses are covered. Indications and contraindications of moxibustion, scalp acupuncture and electrical acupuncture stimulation are covered. Prerequisites: APT 511 and APT 523: Point Location I and II.

2 lecture hours, 2 laboratory hours, 3 semester credits.

Offered: Fall semester

APT 625

Acupuncture Techniques II

This course covers functions, indications and needling methods of the Well, Spring, Stream, River, Sea, Source, Luo, Xicleft, Back Shu, Front Mu and Lower He-Sea, Eight Influential, Eight Confluent and important crossing points. Continuing practice in needling, moxibustion and cupping techniques is included. In addition, the prevention and treatment of acupuncture complications is covered. Prerequisite: APT 614 Techniques I.

2 lecture hours, 2 laboratory hours, 3 semester credits.

Offered: Spring semester

APT 626

Auricular & Scalp Acupuncture

This course introduces the student to various forms of microsystem acupuncture, focusing on auricular and scalp systems. The student learns the respective maps of the scalp and ear, clinical applications and treatment strategies. Corequisite/Prerequisite: APT 614 Acupuncture Techniques I,

1 lecture hour, 1 semester credit.

Offered: Spring semester

APT 718

Pediatric Acupuncture

The special diagnostic and treatment skills required for the treatment of patients less than

12 years of age are discussed. The balance of safety for the patient and treatment efficacy is emphasized. Prerequisite: APT 625 Acupuncture Techniques II.

1 lecture hour, 1 semester credit.

Offered: Spring semester

APT 637

Japanese Acupuncture Techniques

This course covers the unique treatment strategies and protocols developed by Japanese acupuncture masters. Prerequisite: APT 614 Acupuncture Techniques I.

1 lecture hour, 1 semester credit.

Offered: Summer semester

Asian Medicine Theory, Diagnosis and Application (ATD)

ATD 511

TCM History and Philosophy

The student studies the different eras of Chinese history and the effects on TCM Medicine theories. This course includes the study of the development of Naturalism, Philosophical and Religious Taoism, Confucianism, and Buddhism and their contributions to Chinese Medicine. For each philosophy, the course examines how the philosophy views the human relationship to nature, and the human relationship to the universe. In addition, the impact of philosophy and religion on the TCM medical paradigm is explored. Prerequisite: none.

1 lecture hour, 0 laboratory hours, 1 semester credit.

Offered: Fall and summer semesters

ATD 512

TCM Medical Theory

This course includes the classic theories of yin and yang and the Five phases that are fundamental to understanding the TCM medical relationship between humans and the universe. Normal physiology is studied through the fundamental substances (Qi, Blood, Essence, Spirit and bodily fluids), and organs. The basic theory of illness and diagnosis using four examinations (sight, listening and smelling, palpation, and asking) and Eight parameters are covered. Prerequisites: Anatomy and Physiology.

2 lecture hours, 2 semester credits.

Offered: Fall semester

ATD 513

TCM Diagnosis I

The basic theory and characteristics of the pathogenesis and pathogenic factors are covered including the seven emotions, disharmony of Yin and Yang, abnormalities in Qi,

Blood, Spirit, Essence and Bodily fluids, and organ disharmonies are covered. Techniques in inquiry, palpation, tongue and pulse diagnosis are covered. Diagnoses incorporating the eight parameters as well as root and stem concepts are covered for each of the twelve zang-fu. Prerequisite/Co-requisite: ADT 512 TCM Medical Theory.

2 lecture hours, 2 semester credits.

Offered: Fall semester

ATD 524

TCM Diagnosis II

This course will provide the student with further understanding of TCM Medicine diagnosis, expanding on concepts from TCM Diagnosis I. Traditional Chinese Medicine organ diagnoses, eight principle and febrile disease diagnoses will be stressed. In addition, treatment principles and acupuncture treatments based on these diagnostic systems will be explored. Differential diagnoses of common disease entities will be explored. Students will also continue to practice pulse and tongue diagnosis. Prerequisite: ADT 513 TCM Diagnosis I.

2 lecture hours, 2 semester credits.

Offered: Spring semester

ATD 515

Seminar 1

This course will help the student to negotiate their first year in the Acupuncture program. The student will be guided through overviews of Chinese Medicine as preparation for integrating material from the entire curriculum. The student will review and update Chinese Medical terminology as well as the range of resources and the different perspectives on this terminology and the concepts contained therein. Diagnostic practical skills such as pulse and tongue diagnosis will be reviewed in a practical group setting. In addition the student will apply concepts of information literacy and its use for analysis of case studies. Prerequisites: none.

1 lecture hour, 1 semester credit.

Offered: Spring semester

ATD 529

Seminar 2

This course will be a continuation of seminar one. The student will be guided through the application and integration of concepts and skills acquired in the first and second semester curricula. The student will apply these through the use of case studies and clinical examples. The basics of applying diagnosis and generation of treatment principles will be reinforced in a collegial setting. Group activities such as case analysis, pulse and tongue analysis and

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grand rounds will also be reviewed with a deepening understanding of clinical applications of such. Prerequisites: ATD 515.

1 lecture hours, 1 semester credit.

Offered: Fall semester

ATD 618

Seminar 3

This course will help the student gain a deeper understanding of case study skills necessary to become a TCM clinical practitioner. The student will be guided through case study, case analysis and pattern differentiation as utilized in clinical practice as preparation for integrating material from the entire curriculum into the clinical setting. Case presentations and clinical skills utilizing a problem based learning format using TCM principles and evidence-informed clinical practice skills are emphasized. The focus of the case studies for this course is mental/emotional disorders, patterns associated with emotional disorders, and the impact of emotional issues in the acupuncture clinic. In addition, the student will gain a basic understanding of the ethical and counseling issues surrounding licensed practice in the field of Traditional Chinese Medicine. Prerequisites: ATD 529.

1 lecture hours, 1 semester credit.

Offered: Fall semester

ATD 711

Differential Diagnosis and Pathomechanisms

This course compares and contrasts diagnosis and treatment between Western and TCM diagnoses. Western medical diagnosis of these diseases is incorporated so that the student is able to collaborate with western physicians. Major and common categories of diseases including respiratory tract, infectious, gastrointestinal, genitourinary and musculoskeletal diseases are covered. Prerequisite: ADT 513 TCM Diagnosis I.

2 lecture hours, 2 semester credits.

Offered: Fall and summer semester

ATD 715

TCM Internal Medicine

This course focuses on the diagnosis and TCM treatment of major illness. Treatment planning includes acupuncture, qi gong, and massage. Diagnoses cover respiratory illnesses, gastrointestinal, genitourinary, gynecological, and psychological illnesses. Root-stem, Meridian, Substance and 5 Element treatments are included. Prerequisite: ATD 513 TCM Diagnosis I.

2 lecture hours, 2 semester credits.

Offered: Fall semester.

ATD 717

Advanced Tongue and Pulse Diagnosis

This course is designed to increase the diag-

nostic skills and clinical applications of these uniquely TCM diagnostic parameters. The student studies healthy and diseased tongues and pulses and discusses how findings in these areas change the treatment principles and strategies. Case studies from the clinical rotations are used to increase both depth and breadth of skill. Prerequisite: ADT 524: TCM Diagnosis II.

1 lecture hour, 1 semester credit

Offered: Spring semester

ATD 727

Case Studies 1

The student will be guided through case study, case analysis and pattern differentiation as utilized in clinical practice as preparation for integrating material from the entire curriculum into the clinical setting. Case presentations and clinical skills are emphasized through a problem based learning format using TCM principles as the foundation. Emphasis for this class is on cases associated with problems of fluid dynamics, meridian diagnoses and chronic pain, which are frequent chief complaints in the TCM clinical setting. Prerequisite: ATD 529 Seminar 2.

1 lecture hour, 1 semester credit

Offered: Spring semester

ATD 728

Case Study 2

Students learn to transition from the development of pattern diagnosis to TCM treatment principles which then lead to point and modality applications. Emphasis is placed on an accurate assignment of symptoms to pattern diagnosis; logical treatment principles reflecting the priorities and totality of the patterns diagnosis; and the most efficacious acupuncture point and adjunctive modality prescriptions to help the patient achieve health. Prerequisite: ATD 524 TCM Diagnosis II.

1 lecture hour, 1 semester credit.

Offered: Fall and summer semesters

ATD 729

Acupuncture Gynecology

This course is designed to familiarize the student with TCM diagnosis and acupuncture treatments of common gynecologic conditions. Special emphasis is placed on understanding those points forbidden to needle or moxa in cases where the patient's pregnancy status is unknown. Prerequisite: ADT 524: TCM Diagnosis II.

1 lecture hour, 1 semester credit.

Offered: Fall and summer semesters

Western Biomedicine (AWB)

ACS 511

Evidence-Informed Clinical Practice in Acupuncture

The basic principles of clinical and laboratory research are examined with a special emphasis on the applications of acupuncture and TCM techniques in the research setting. Application of research to case evaluation will be emphasized. Prerequisite: none.

1 lecture hour, 1 semester credit.

Offered: Fall semester

AWB 621

Medical Ethics

This course is designed to provide the student with a basic understanding of the ethical issues surrounding practice in any medical field. Upon completion of this course, the student will be able to identify concepts of medical and professional ethics as they apply to the practice of health care. Prerequisite: none.

1 lecture hour, 1 semester credit.

Offered: Spring semester

ABS 511

Anatomy 1

This course provides an in-depth study of the macroscopic human anatomy and covers the structure of the trunk and neck regions. Clinical aspects of the vascular and neurological relationships of these regions are emphasized. Instruction includes lectures and interactive media software. Prerequisite: none.

4 lecture hours, 4 semester credits.

Offered: Fall semester

ABS 522

Anatomy 2

This course is a continuation of Anatomy 1 and covers the structure of the head and extremities. Clinical aspects of the neurological and vascular relationships of these regions is emphasized. Prerequisite: ABS 511 Anatomy 1.

4 lecture hours, 4 semester credits.

Offered: Spring semester

ABS 515

Physiology 1

This course emphasizes the function of cellular structures which regulate homeostasis as well as their role in cell division and genetic control of protein synthesis. Emphasis is placed on the role of the cell membrane in the control of cellular events. The effects of physiology on hormones, their role in homeostasis, and the functional changes associated with homeostasis are considered. Prerequisite: none.

2 lecture hours, 2 semester credits.

Offered: Fall semester

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ABS 525

Physiology 2

This course is a study of physiology at the organ and systems level. Included is the study of the circulatory, respiratory, renal, cardiovascular, gastrointestinal and urogenital systems. Also included is the study of the endocrine system and its interrelationships with various organs and systems. There is an integration of normal physiology with pathophysiology and clinical concepts. Prerequisite: ABS 515.

2 lecture hours, 2 semester credits.

Offered: Spring semester

AWB 523

Pharmacology

This course examines the most commonly used pharmacologic agents to be encountered in the clinical setting. The general principles of pharmacology (pharmacodynamics and pharmacokinetics) are covered. Uses and side effects of antibiotics, anti-inflammatory agents, hormones and cardiac drugs are surveyed. Drug-nutrient and drug-herb interactions are discussed. Prerequisite: none.

1 lecture hour, 1 semester credit.

Offered: Spring semester

AWB 522

Research Methodology

The basic principles of clinical and laboratory research are examined with a special emphasis on the applications of acupuncture and TCM techniques in the research setting. Prerequisite: none.

1 lecture hour, 1 semester credit.

Offered: Fall semester

ACS 611

Pathology 1

This course is a study of the pathophysiological process and how this process alters the gross, microscopic and clinical manifestations of disease. Basic pathological processes of inflammation, repair, degeneration, necrosis, immunology and neoplasia are presented. Prerequisite: ABS 525 Physiology 2.

2 lecture hours, 2 semester credits.

Offered: Fall semester

ACS 624

Pathology 2

This course is the continuation of the pathological processes of various diseases. This course emphasizes the basis of systemic diseases of the cardiovascular, respiratory, gastrointestinal, urogenital, endocrine, hepatobiliary, renal and pancreatic systems. Prerequisite: ACS 611 Pathology 1.

4 lecture hours, 4 semester credits.

Offered: Spring semester

ACS 612

Clinical Diagnosis 1

This course covers the techniques used for physical examination for various systems of the body. Skills taught develop an appreciation for normal variations and abnormalities associated with disease states. The student is taught to recognize the signs and symptoms of common diseases. Prerequisites: ABS 511, ABS 522, ABS 515, ABS 252.

3 lecture hours, 2 lab hours, 4 semester credits.

Offered: Fall semester

ACS 623

Clinical Diagnosis 2

This course is a continuation of Clinical Diagnosis 1. Prerequisite: ACS 612.

3 lecture hours, 2 lab hours, 4 semester credits.

Offered: Spring semester

ACS 724

Public Health

This course covers current environmental and public health concerns with an emphasis on the role of the acupuncturist in these issues. The course integrates health with diet, water and air pollutants, noise and substance abuse. Recognition of major communicable diseases is included. Prerequisite: ABS 525 Pathology 2.

2 lecture hours, 2 semester credits. (online course)

Offered: Spring semester

ACS 613

Lab Diagnosis

This course introduces the student to the appropriate use and interpretation of laboratory tests. Prerequisites: ABS 511 and ABS 525.

2 lecture hours, 2 semester credits.

Offered: Fall semester

ANT 521

Western Nutrition

This course provides the foundation for therapeutic nutrition. It explores the biochemistry of macronutrients as well as vitamins and minerals. Deficiencies, toxicities, therapeutic uses and appropriate doses are examined. An assessment of dietary needs and the application of therapeutic nutrition in treating individual diseases and syndromes are also taught. Prerequisites: none.

2 lecture hours, 2 semester credits.

Offered: Spring semester

ACS 711

Diagnostic Imaging

This course covers radiographic anatomy and diagnostic imaging techniques. A basic intro-

duction to imaging, including roentgenology, computerized tomography (CT), magnetic resonance imaging (MRI), ultrasound, and bone scanning are discussed. The basic concepts of these techniques and their use in diagnosis are discussed. Prerequisites: Anatomy 2, Physiology 2.

ACS 625

Physical Exam Skills

This course helps students develop the skills necessary to conduct screening physical exams and specialty exams useful in the ambulatory practice. The student will learn the appropriate exam and physical diagnostic procedures that correspond with the patient's chief complaint and medical history. Clinical decision making and identification of clinical red flags are emphasized. Physical examination skills: Cardio, Chest/Pulmonary, Abdomen/GI, Neuro, General screening exam, physical exam of the spine, physical exam of the major joints (shoulder, elbow, hip, knee, foot). Prerequisites: Clinical Dx 1.

ACS 626

Laboratory Diagnosis 2: Nutritional and functional analyses

This course will educate the student on nutritional assessment to include health, diet and lifestyle history, physical measurements, and laboratory testing to include analysis of blood, stool, saliva and urine. The course will integrate use of these measurements in the design of an appropriate nutritional protocol for the client. The student will also learn effective client management and follow-up. Prerequisites: Clinical Dx 1, Lab Dx 1.

AWB 725

Pharmacology 2

This course builds on the basic information in Pharmacology 1 to expand the student's understanding of pharmacology, including mechanisms of action; absorption, distribution, metabolism, and excretion (pharmacokinetics/pharmacodynamics); interactions with other drugs and with herbs/food; problems with special populations (prenatal, neonatal, elderly); rational drug usage for clinical disorders (therapeutics); clinical effects of drugs (by category); and toxicology.

Herbal Medicine Survey (AHM)

AHM 521

Botanical Medicine 1

This course comprises a survey of plant and plant preparations most commonly used in Western traditions. The actions of the plant and plant products, as well as drug-herb in-

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teractions are considered. Prerequisites: ABS 515, ACS 611.

3 lecture hours, 3 semester credits.

Offered: Fall semester

AHM 613

Traditional Chinese Dietetics

This class introduces the student to the eastern understanding of how food influences human health. Foods and food products are surveyed according to Asian categorization. Food groups are categorized by nature, temperature, taste, element, indications and contraindications. Treatment of the major categories of organ (zang-fu) disorders using foods and food combinations are covered. Prerequisite: ADT 513 TCM Diagnosis I.

2 lecture hours, 2 semester credits.

Offered: Fall semester

AHM 612

Introduction to Chinese Herbal Remedies

This survey course introduces the student to the diagnostic and treatment strategies specific to TCM herbal therapies. The student is introduced to major herbs and formulas of China, their uses, contraindications and drug-herb interaction. Patient safety issues are also addressed. Prerequisite: ATD 513 TCM Diagnosis 1.

1 lecture hours, 1 semester credit.

Offered: Fall semester

AHM 713

Patent Remedies

This course will survey over 150 prominent, TCM, topical and internal herbal, patent formulas. Students will be introduced to pattern-specific uses of these formulas and subsequently, their contraindications, toxicities and potential drug interactions. Safety, legal, and manufacturing issues will also be highlighted. Prerequisite: AHM 612: Introduction to Chinese Herbal Remedies.

2 lecture hours, 2 semester credits

Offered: Spring semester

AHM 634

Dispensary Management

This course will develop knowledge and skills related to TCM dispensary management. Students will learn best practices for successfully and legally running a Chinese herbal dispensary. Combining lecture and experiential learning, students will become acquainted with dispensing practices, proper record-keeping, inventory management, and safety protocols for a well-organized TCM dispensary. Prerequisites: none

1 lecture credit, 18 hours.

Offered: Summer semester

AHM 635

Pharmacognosy and Pharmacology of Chinese Herbs

Chinese material medical are often prescribed in complex formulae. Understanding the chemistry, interactions, extraction methodology, and drug interactions allows TCM practitioners better insights to possible adverse effects, from drug-herb interactions, herb toxicities to lack of expected (or any) outcomes from prescribed formulae. Several recorded incidents of adverse reactions have occurred to Chinese herbs over the past 12 years. In most cases, the incidents have involved multiple patients consuming the same or similar substance, rather than isolated case reports. It is important to review the unique aspects of Chinese medicine) which are of relevance to understanding these issues. Prerequisites: ACH 523 Chinese Herbal Theories & Triple burner theories.

1 lecture credit, 18 hours.

Offered: Summer semester

AHM 616

Ethical and ecological considerations of Chinese materia medica

The traditional practice of using endangered species (plant and animal) is controversial within TCM. Comprehensive Chinese herbal textbooks often discuss substances derived from endangered species, emphasizing alternatives. Poaching and black market issues with animal products, particularly tiger bone, rhinoceros horn, seahorse and bear bile have all raised ethical and ecological concerns in the use of Traditional Chinese formulae. In this course, we will discuss the ethical and ecological impacts of TCM materia medica on the health of the individual and the world. Prerequisites: none

1 lecture credit, 18 hours

Offered: Fall semester

Movement, Respiration and Bodywork Studies (AMR)

AMR 511

Taijiquan 1

The student experiences how musculoskeletal alignment, breathing, and mental awareness improve Qi circulation in the student's own body through practice of this traditional Chinese therapeutic exercise. The emphasis is on analysis of how individual Taijiquan movements circulate Qi through specific meridians in accordance with TCM theory and clinical practice. The student also learns Taijiquan history and safety considerations. Prerequisite: none.

1.5 laboratory hours, 1 semester credit.

Offered: Fall semester

AMR 522

Taijiquan 2

This course is a continuation of Taijiquan 1. In addition to more advanced Taijiquan exercises for Qi circulation, the student learns basic application of Chinese therapeutic movement to the clinic setting. Prerequisite: AMR 511 Taijiquan 1.

1.5 laboratory hours, 1 semester credit.

Offered: Spring semester

AMR 613

Qigong 1

The student learns basic Qigong theory and techniques designed to regulate specific meridians, muscles, joints, and zangfu, as well as how to choose, integrate, and teach the appropriate exercises in a clinic setting. Prerequisite: AMR 522 Taijiquan 2.

1.5 laboratory hours, 1 semester credit.

Offered: Fall semester

AMR 624

Qigong 2

This course is a continuation of Qi Gong 1. The student learns advanced exercises, meditations, and breathing exercises that can be applied both to the clinic setting as well as to the student's personal experience and development of Qi toward the goal of being a more effective TCM practitioner. Prerequisite: AMR 613 Qigong

1. 1.5 laboratory hours, 1 semester credit.

Offered: Spring semester

AMR 627

Tuina 1

The student learns basic Tuina manipulation theory and techniques to treat acupoints, channels, and soft tissue as well as Qigong conditioning exercises that allow the student to implement Tuina manipulation safely and effectively. The course culminates in learning a Tuina full-body therapeutic protocol. Prerequisite: ABS 522 Anatomy 2.

1 lecture hour, 2 laboratory hours, 2 semester credits.

Offered: Summer semester

AMR 715

Tuina 2

This course is a continuation of Tuina 1. The student learns intermediate Tuina manipulation theory and techniques to treat acupoints, channels, and soft tissue. Tuina treatments for back pain and conditions of the upper limb are the primary focus.

Prerequisite: AMR 627 Tuina 1.

1 lecture hour, 2 laboratory hours, 2 semester credits.

Offered: Fall semester

Acupuncture

AMR 726

Tuina 3

This course is a continuation of Tuina 2. The student learns advanced Tuina manipulation theory and techniques to treat acupoints, channels and soft tissue. Tuina treatments for the leg and internal conditions are the primary focus. Prerequisite: AMR 715 Tuina 2.

1 lecture hour, 2 laboratory hours, 2 semester credits

Offered: Spring semester

Counseling, Communications and Practice management

APS 621

Psychological Assessment

The primary focus of this course is the diagnosis of the various psychiatric diseases according to the Diagnostic and Statistical Manual of Mental Disorders. Included are psychological assessment considerations and treatment modalities. Prerequisites: none.

2 lecture hours, 2 semester credits

Offered: Spring semester

APP 721

Practice Management

Students are taught the current procedural practices for the operation of a private practice. In addition, the practical aspects of operating a practice as a small business are discussed. Students are encouraged to begin thinking about their personal career path as a complementary medicine practitioner in private practice, group practice, hospital-based practice or as an TCM educator. Prerequisites: none.

2 lecture hours, 2 semester credits.

Offered: Spring semester

APP 722

Professional Development

This course will explore the issues associated with ongoing professional development. Professional development assists the AOM practitioner to develop the knowledge and skills necessary to further clinical competence and contribute to the body of knowledge in the field during practice after graduation. Prerequisites: ACS 731 Clinic Entry 1, ACS 631 Clinic 1.

1.5 lecture credits, 0 lab credits, 1.5 credits total

ACH: Asian/Chinese Herbology

ACH 511

Chinese Formula and Constituents 1

The student will explore the traditional Chinese Medicine Materia Medica in depth and learn

to discriminate between herb categories, their general applications and associated Treatment Principles and individual, unique applications, signs and symptoms. The student will explore at least 100 herbs. This course will focus on herbs from the Release Exterior, Clear Heat, and Drain Downwards categories. In addition at least 10 representative formulae that reflect these categories will be investigated. This course will serve as partial basis for the formulae courses. Prerequisites: satisfactory progress in first year curriculum from MSTCM program.

2 lecture credits, 36 hours

Offered: Fall semester

ACH 512

Chinese Formulae and Constituents 2

The student will explore the traditional Chinese Medicine Materia Medica in depth and learn to discriminate between herb categories, their general applications and associated Treatment Principles and individual, unique applications, signs and symptoms. The student will explore at least 100 herbs. This course will focus on Herbs from the Regulate Qi, Regulate and Invigorate Blood, Warm Interior and Expel Cold, Tonify (Qi and Blood) categories. In addition at least 10 representative formulae that reflect these categories will be investigated. This course will serve as partial basis for the formulae courses. Prerequisites: ATD 524 TCM Diagnosis II.

2 lecture credits, 36 hours

Offered: Fall semester

ACH 523

Chinese Formulae & Constituents 3

The student will explore the traditional Chinese Medicine Materia Medica in depth and learn to discriminate between herb categories, their general applications and associated Treatment Principles and individual, unique applications, signs and symptoms. The student will explore at least 100 herbs. This course will focus on Herbs from the Drain Damp, Transform Phlegm and Stop Cough, Aromatic Herbs that Transform Damp, Food Stagnation categories. In addition at least 10 representative formulae that reflect these categories will be investigated. This course will serve as partial basis for the formulae courses. Prerequisites: satisfactory progress in first year curriculum from MSTCM program. Prerequisites: ACH 512

2 lecture credits, 36 hours

Offered: Spring semester

ACH 524

Chinese Formulae and Constituents 4

The student will explore the traditional Chinese Medicine Materia Medica in depth and learn to discriminate between herb categories,

their general applications and associated Treatment Principles and individual, unique applications, signs and symptoms. The student will explore at least 100 herbs. This course will focus on Herbs from the Tonify (Yang and Yin), Stabilize and Bind, Calm Shen, Aromatic Substances to Open Orifices, Extinguish Wind and Stop Tremors, Expel Parasites, External Applications categories. In addition at least 10 representative formulae that reflect these categories will be investigated. This course will serve as partial basis for the formulae courses. Prerequisites: ACH 512

2 lecture credits, 36 hours

Offered: Spring semester

ACH 635

CH Formulae 1

This course will be a continuation and amplification of the previous herbal curriculum (ACH 511, ACH 512, ACH 523, ACH 524) with an emphasis on herbal formulae. The student will explore at least 30 formulae including reiterating and expanding content from previous courses. This course will focus on formulae that Release the Exterior, Clear Heat, and Drain Downward. The student will learn the name, actions, indications, cautions and contraindications of the classical base formulae according to the traditional categorization based on treatment principles. In addition the student will explore the traditional structure of herbal formulae as a prelude to formula modification (general, assistant, etc.). In addition the student will review and reiterate content from the Formulas and their constituents courses. Prerequisites: ACH 511, ACH 512, ACH 523

2 lecture credits, 36 hours

Offered: Summer semester

ACH 636

Chinese Formulae 2

This course will be a continuation and amplification of the previous herbal curriculum (ACH 511, ACH 512, ACH 523, ACH 524) with an emphasis on herbal formulae. The student will explore at least 30 formulae including reiterating and expanding content from previous courses. This course will focus on formulae that Harmonize, Dispel Summerheat, Warm Interior Cold, Release Exterior-Interior Excess, and Tonify. The student will learn the name, actions, indications, cautions and contraindications of the classical base formulae according to the traditional categorization based on treatment principles. In addition the student will explore the traditional structure of herbal formulae as a prelude to formula modification (general, assistant, etc.). Prerequisites: ACH

Acupuncture

511, ACH 512, ACH 523, ACH 524

2 lecture credits, 36 hours

Offered: Summer semester

ACH 617

Chinese Formulae 3

Course Description: This course will be a continuation and amplification of the previous herbal curriculum with an emphasis on herbal formulae. The student will explore at least 80 formulae including reiterating and expanding content from previous courses. This course will focus on formulae that Stabilize and Bind, Calm the Spirit, Open the Sensory Orifices, Regulate Qi, Regulate Blood, Expel Wind, Treat Dryness, Expel Dampness, Dispel Phlegm, Reduce Food Stagnation, Expel Parasites, Treat Abscesses and Sores, and for External Application. The student will learn the name, actions, indications, cautions and contraindications of the classical base formulae according to the traditional categorization based on treatment principles. In addition the student will explore the traditional structure of herbal formulae as a prelude to formula modification (general, assistant, etc.) In addition the student will review and reiterate content from the Formulas and their constituents courses. Prerequisites: ACH 635

2 lecture credits, 36 hours

Offered: Fall semester

ACH 628

CH Internal Medicine & Modifications 2

This course will serve as a companion course to ACH 619. This course will be a continuation and amplification of the previous herbal curriculum with an emphasis on internal medicine applications of herbal formulae. The student will reexamine previously studied herbs and formulae from previous courses with special attention to clinical application and formula modification according to clinical presentation. Prerequisites: ACH 619, 2 lecture credits, 36 hours. Prerequisites: ACH 617

2 lecture credits, 36 hours

Offered: Spring semester

ACH 619

CH Internal Medicine & Modifications 1

This course will be a continuation and amplification of the previous herbal curriculum with an emphasis on internal medicine applications of herbal formulae. The student will reexamine previously studied herbs and formulae from previous courses with special attention to clinical application and formula modification according to clinical presentation. Prerequisites: ACH 636

2 lecture credits, 36 hours

Offered: Fall semester

ACH 641

CH Special Topics

This course will explore special topics in TCM herbal medicine. These will include but not be limited to dui yao (herb combinations and modules), external applications, pediatrics, classical formulae from seminal texts. Content will also reflect the availability of special guest lecturers. Prerequisites: ACH 619

2 lecture credits, 36 hours

Offered: Spring semester

Clinical Services (ACS)

ACS 711

Preceptorship I

The students observe and administer care in established acupuncture facilities under the supervision of licensed physicians and acupuncturists. This exposure to a variety of clinical settings helps prepare the student for both private practice and integrative patient care. Prerequisite: Completion of all first year courses.

0 lecture hours, 4 laboratory hours, 2 semester credits, 75 clock hours total.

Offered: Fall, spring and summer semesters

ACS 722

Preceptorship II

This is a continuation of ACS 711. Students increase their clinical skills working under a variety of health care professionals, all of whom must have the appropriate credentials to practice in the field of acupuncture. Prerequisite: ACS 671.

0 lecture hours, 4 laboratory hours, 2 semester credits, 75 clock hours total.

Offered: Fall, spring and summer semesters

ACS 631

Clinical Education 1

Under the supervision of licensed faculty members, the interns start by observing patients for 30 clinic hours, then move into the area of direct patient care. All patient diagnoses and management plans are reviewed and approved by a clinic faculty member prior to the initiation of patient care. The student will begin to practice clean needle technique, removal and disposal of needles. The student will acquire proficiency in tongue and pulse diagnosis. Prerequisite: Pass Clinical Entrance Exam.

0 lecture hours, 12 laboratory hours, 8 semester credits, 245 clock hours total.

Offered: Fall, spring and summer semesters

ACS 712

Clinical Education 2

Students continue to administer care to patients under the supervision of licensed facul-

ty. Students are monitored as to their progress toward completing the qualitative and quantitative requirements necessary for the successful completion of the program. Eligibility for the course is successful completion of the previous clinical course. Prerequisite: ACS 631 Clinical Education 1.

0 lecture hours, 12 laboratory hours, 8 semester credits, 215 clock hours total.

Offered: Fall, spring and summer semesters

ACS 723

Clinical Education 3

Students continue to administer care to patients under the supervision of licensed faculty. Students are monitored as to their progress toward completing the qualitative and quantitative requirements necessary for the successful completion of the program. Eligibility for the course is successful completion of the previous clinical course. Prerequisite: ACS 712 Clinical Education 2.

0 lecture hours, 12 laboratory hours, 8 semester credits, 220 clock hours total.

Offered: Fall, spring and summer semesters

ACC: Clinical Education

ACC 611

Chinese Herbal Clinic 1

Under the supervision of licensed faculty members, the interns start by observing patients for 20 clinic hours, then move into the area of direct patient care. All patient diagnoses and management plans are reviewed and approved by a clinic faculty member prior to the initiation of patient care. The student will begin to prescribe individual herbs and formulae for patient care. The student will acquire proficiency in TCM diagnostic techniques, as well as in understanding when specific herbs or formulae may not be prescribed based upon possible herb-drug interactions. Prerequisite:

0 lecture hours, 4 lab credits, 130 clock hours total.

Offered: Fall, spring and summer semesters

ACC 632

Chinese Herbal Clinic 2A

Students continue to administer Chinese herbal care to patients under the supervision of licensed faculty. Students are monitored as to their progress toward completing the qualitative and quantitative requirements necessary for the successful completion of the program. Eligibility for the course is successful completion of the previous clinical rotation. Prerequisite: ACC 611 Chinese Herbal Clinic 1.

0 lecture hours, 2 lab credits, 65 clock hours total.

Offered: Fall, spring and summer semesters

Acupuncture • Biology

ACC 723

Chinese Herbal Clinic 2B

Students continue to administer Chinese herbal care to patients under the supervision of licensed faculty. Students are monitored as to their progress toward completing the qualitative and quantitative requirements necessary for the successful completion of the program. In addition to utilizing prepared formulae, student interns now begin to mix herbal powders in individualized formulae. Eligibility for the course is successful completion of the previous clinical rotation. Prerequisite: ACC 611 Chinese Herbal Clinic 1. Pre/Co-Requisite ACC 632 Chinese Herbal Clinic 2A.

0 lecture hours, 2 lab credits, 65 clock hours total.

Offered: Fall, spring and summer semesters

ACC 724

Chinese Herbal Clinic 3

Students continue to administer care to patients under the supervision of licensed faculty. Students will integrate herbal therapies with dietary advice and qi enhancement techniques. Students are monitored as to their progress toward completing the qualitative and quantitative requirements necessary for the successful completion of the program. Eligibility for the course is successful completion of the previous clinical rotation. Prerequisite: ACC 723 Chinese Herbal Clinic 2B.

0 lecture hours, 3 lab credits, 100 clock hours total

Offered: Fall, spring and summer semesters

Integrated Clinical Practice (AIC)

AIC 731

Clinical Procedures 1

This course explores the clinical applications of the skills and knowledge learned to date for patient care in the UB Clinics. In addition, UB Clinics skills including using the electronic health system for charting, and communication with patients and other health providers in the UB Clinics is reviewed.

Prerequisites: ACS 623 Clinical Dx 1, ATD 72 Case Studies 1, AWB 621 Medical Ethics.
2 lecture credits, 0 lab credits, 2 credits total

AIC 714

Clinical Procedures 2

This course explores the clinical applications of the skills and knowledge learned to date for patient care in multi-disciplinary care clinics and hospital settings.

Prerequisites: ACS 731 Clinical Procedures 1, AIC 631 Clinic 1.
2 lecture credits, 0 lab credits, 2 credits total

AIC 715

Physical and Functional Assessments of the UB Health Sciences

This course is designed to teach the student general principles and practices of health care from the breadth of providers trained at the University of Bridgeport. The naturopathic, chiropractic, nutrition, dental hygiene and physician assistant history and scope of practice will be discussed. Practical applications of these disciplines in the area of physical and functional assessment of patients will be emphasized. Prerequisites: Clinical Dx 2, Lab Dx 1.

AIC 811

Grand Rounds 1

This course is designed to train the AOM student to communicate effectively, orally and in writing, with patients and their families, colleagues, and others with whom health-professionals must exchange information in carrying out their responsibilities in patient care. Prerequisites: ACS 714 Clinic Entry 2; ATD 715 TCM Internal Medicine; ACC 611 Chinese Herb Clinic 1. Co-requisite: AIC 812 Integrated Clinical Education 1.

2 lecture credits, 0 lab credits, 2 credits total

AIC 823

Grand Rounds 2

This course is designed to train the advanced AOM student to communicate with other health care providers to determine an appropriate plan of care. This includes the ability to assess written diagnostic reports, including the range of values that distinguish normal from abnormal findings, as relevant to patient care and communication with other health care providers. Upon completion, the student will be able to discuss the clinical scope of AOM in an informed, authoritative, and appropriate manner. Prerequisites: AIC 811 Grand Rounds 1; Co-requisite: AIC 814 Integrated Clinical Education 2.
2 lecture credits, 0 lab credits, 2 credits total.

AIC 812

Integrated Clinical Education 1

Rotations in the Integrative clinic shifts combine AOM supervisors for AOM diagnosis and treatment with biomedical practitioners and other clinicians offering medical care in a variety of health settings. Students administer care to patients under the supervision of licensed faculty. Students are monitored as to their progress toward completing the qualitative and quantitative requirements necessary for the successful completion of the program. Prerequisites: ACS 712 Clinical Education 2; ACC 632 Chinese Herbal Clinic 2A

215 hours; 150 patient visits; at least 90 hours in off-site clinics

AIC 814

Integrated Clinical Education 2

This is a continuation of the integrative clinical training started in ACS 812. Rotations in the Integrative clinic shifts combine AOM supervisors for AOM diagnosis and treatment with biomedical practitioners and other clinicians offering medical care in a variety of health settings. Students continue to administer care to patients under the supervision of licensed faculty. Students are monitored as to their progress toward completing the qualitative and quantitative requirements necessary for the successful completion of the program.

Prerequisites: ACS 712 Clinical Education 2; ACC 632 Chinese Herbal Clinic 2A. AIC 812 Integrated Clinical Education 1.

215 hours; 150 patient visits; at least 90 hours in off-site clinics

Biology

BIOLOGY 400

Advanced Biochemistry

This course will cover the principles of biological chemistry, describe the structure, synthesis, degradation and properties of amino acids and proteins. The principles of enzymology and proteomics, lipid synthesis, degradation, function and lipidomics, mechanisms of carbohydrate metabolism including: glycolysis, gluconeogenesis, tricarboxylic acid cycle, the electron transport chain, photosynthesis, pentose phosphate pathway, and glycogen metabolism, will be covered. The techniques used to identify, characterize, and isolate biological molecules will be discussed.

Prerequisite: Bio 102 or Bio 443 or equivalent
Credit: 3 semester hours

Biology 402

Evolution

Genotype to phenotype mapping, population genetics, molecular evolution, detection of selection, association mapping, human evolution. Prerequisite: Biol 307 or equivalent
Credit: 3 semester hours

BIOLOGY 404

Tissue culture

This course is designed to train students to the techniques used in culturing mammalian tissues and cells. Students will master the necessary skills required for maintaining and analyzing cells in culture, develop laboratory skills related to cell assays and cell staining and research applications using cell cultures. Students will be introduced to concepts of designing in vitro tissue engineering products.

Biology

Prerequisite: Bio 102 or Bio 321 or equivalent
Credit: 3 semester hours

BIOLOGY 407

Microbial/Molecular Genetics

The focus of this course is on modes of genetic transfer, plasmids and mobile genetic elements. Molecular techniques used in prokaryotic research will be emphasized.

Prerequisite: Biol 307 and 320 or equivalent
Credit: 3 semester hours.

BIOLOGY 421

Advanced Cell Biology

Structure and function of subcellular organelles. Transport; the endoplasmic reticulum, protein secretion and membrane biogenesis; the cytoskeleton; mitochondria, chloroplasts and the generation of useful energy and other topics. Prerequisite: Bio 102, or Bio 321 or equivalent
Credit: 3 semester hours

BIOLOGY 423

Advanced Ecology

Students will read classic and recent ecological literature in ecology. At the completion of the course students will prepare a literature review or research proposal.

Prerequisite: Bio 223 or equivalent
Credit: 3 semester hours

BIOLOGY 424

Physiological Ecology

Students will read recent literature across a range of topics in physiological ecology. At the completion of the course students will prepare a literature review or research proposal. Prerequisite: Bio 223 and Bio 211 or equivalent
Credit: 3 semester hours

BIOLOGY 441

Cell Molecular Immunology

A three credit-hour lecture course that will cover the molecules, cells and organs of the immune system. Students will study the structural features of the components of the immune system and their functions. Emphasis of the course will be given on the mechanisms involved in immune system development and responsiveness.

Prerequisites: Bio 211 and 341 or equivalent
Credit: 3 semester hours

BIOLOGY 444

General Toxicology

An advanced course designed for the toxicology student interested in broadening her/his knowledge into the sciences of toxic agents (poisons) and their effect on biological systems and the environment. The relevance of chemical and biological properties of toxic

agents to human health, and the biotransformation reaction of certain chemical agents will be discussed. The course will cover in detailed the toxic effects, at the molecular, cellular, organ and system level, resulting from exposure to xenobiotics. The course content will cover all aspects of toxicology: The General Toxicological Principles, Disposition of Toxic Agents, Nonorgan Directed Toxicity, Target Organ Toxicity, Toxic Agents, Environmental Toxicology and Applications of Toxicology.

Prerequisite: Bio 211, Bio 344 or equivalent
Credit: 3 semester hours

BIOLOGY 445

Advanced Methods in Molecular Biology

A graduate course exploring the fundamental skills required by molecular biology and biotechnology. This course will emphasize key methodologies utilized in both biotechnology industries and molecular biology research.

Prerequisite: Bio 345 or equivalent
Credit: 3 semester hours

BIOLOGY 446

Environmental Toxicology

Students will broaden their knowledge of environmental toxic agents (physical, chemical, biological) and their effect on biological systems and the environment. The relevance of chemical and biological properties of toxic agents to human health, and the biotransformation reaction of certain chemical agents will be discussed. The course will cover in detailed the physical-chemical properties and their toxic effects, at the molecular, cellular, organ and system level, resulting from exposure to environmental pollutants.

Prerequisite: Bio 444 or equivalent
Credit: 3 semester hours

BIOLOGY 479

Biologyinformatics

Students will analyze nucleic acid acid, protein, and genomic datasets using biocomputational methodologies.

Prerequisite: Bio 345 or equivalent
Credit: 3 semester hours

BIOLOGY 491

Gut Microbiota in Health and Disease

This course covers complex host-microbial interactions that are essential for health.

Disturbing the relationships triggers a wide variety of diseases such as obesity and diabetes. Factors perturbing the gut microbes include dietary changes, drugs, stress, surgical intervention and the environment.

Prerequisite: Bio 320 or the equivalent
Credit: 3 semester hours

BIOLOGY 493

Bioelectric Phenomena

The course will review and investigate a variety of bioelectric phenomena, including origins and operations of trans-membrane potentials in excitable cells, their propagation between and among cells, their dissemination among various conductive tissues and different body fluid compartments and their measurement within the body or at the body surface. Also considered will be the generation, conduction and propagation of electrical or electromagnetic fields within and beyond the body and the interaction of such fields with ionizing and non-ionizing radiation generated naturally as well as by present and developing technology, with emphasis on health effects of such interactions.

Prerequisite: Bio 113, 114, or Bio 211 or equivalent
Credit: 3 semester hours

BIOLOGY 470

Research Rotation

This course is given in the Spring semester and consists of sequential laboratory experiences in each of two separate research laboratories.

Credit: 1 semester hour. Laboratory fee: \$60 per semester.

BIOLOGY 490

Departmental Seminar

Enrollment and attendance at this seminar is required of all students. Presentations by invited speakers from University of Bridgeport, other universities, and research institutions.

Credit: 1 semester hour per semester

BIOLOGY 497

Selected Topics in Integrated Health and Healing

A seminar discussing current research in integrated biomedical sciences and complementary alternative medicine. Seminar will feature guest lecturers from CAM and IBS disciplines both at UB and other institutions.

Credit: 1 semester hour

BIOLOGY 498

Internship

The student will complete internship in a research or clinical facility, with departmental approval.

Credit: 3 semester hours.

Biology 499

Master's Research

Supervised research leading to the preparation and completion of a thesis in partial fulfillment of the master's degree requirements. Students enrolled in the thesis program must complete six credits of master's research.

Credit: 3 semester hours per semester. Laboratory fee: \$60 per semester.

Biology • Biomedical Engineering

BIOLOGY 500

Maintaining Matriculation

Students not registered for other courses must register for Bio 500 until the completion of the degree requirements.

No credit.

MATHEMATICS 420B

Biostatistical Analysis

Statistical analysis with application to biological science. Includes applications of probability, classifications of data, averages, dispersion, frequency distributions, confidence intervals, tests of significance, linear regression, and correlation.

Prerequisite: Math 320 or equivalent. May be taken concurrently.

Credit: 1 semester hours

Biomedical Engineering

BIOMEDICAL ENGINEERING 410 (BMEG 410/ELEG 410)

Biosensors

This course will provide an overview of biosensors, including their use in pharmaceutical research, diagnostic testing, and policing the environment. Topics include the fabrication, characterization, testing, and simulation. The transducer phenomenology, biosensor structure, and sensor performance will also be covered.

3 semester credits

BIOMEDICAL ENGINEERING 412 (BMEG 412/ELEG 412)

Bioelectronics

Discipline of biomedical Engineering has emerged due to integration of engineering principles and technology into medicine. This course is intended for engineers and engineering students interested in perusing career in biomedical engineering and health related field. This course will first introduction Applications of electrical engineering principles to biology, medicine, behavior, or health will be identified during first half of the semester. Second half of the course will focus on research, design, development and application of biosensors and Bioelectronics.

3 semester credits

BIOMEDICAL ENGINEERING 413

Bioinformatics

Biology has become target of more algorithms than any other fundamental science. This course is about designing and developing algorithms for biological problems. Students will work with popular bioinformatics algorithms not only to understand algorithms design mythologies but also to identify strengths and potential weaknesses in traditional bioinformat-

ics algorithms.

3 semester credits

BIOMEDICAL ENGINEERING 440 (BMEG 440/MEEG 440)

Ergonomic Factors in Design

This course introduces the student to the concepts of ergonomics. Ergonomics is the study of fitting the workplace and devices to the capabilities of the human worker. Students will have an understanding of the beginning and evolution of the field of ergonomics. They will learn to recognize risk factors associated with repetitive stress disorders (e.g., carpal tunnel syndrome) and potential sprain/strain injuries as well as be familiar with the body areas affected. This course covers principles of physiology and biomechanics and how they apply to workstation and tool design.

3 semester credits

BIOMEDICAL ENGINEERING 443 (BMEG 443/ELEG 443)

Digital Signal Processing

This is an introductory course in Digital Signal Processing (DSP) for graduate Electrical and Computer Engineering students. Sometime will be spent initially reviewing major concepts in signals and systems. Major topics to be covered in ELEG 443 include: time-domain analysis of discrete-time (DT) systems (convolution, difference equations), the transform, frequency analysis for DT signals and systems (DTFT, DFT, FFT), digital filter design, and selected advanced topics as time permits.

3 semester credits

BIOMEDICAL ENGINEERING 446 (BMEG 446)

Introduction to MEMS

MEMS (Micro Electro Mechanical Systems) refers to devices and system with very small size in the range of microns. It is one of the most important high technologies developed in 20th century. This course covers the fundamentals of MEMS. It includes the introduction to MEMS, basic microfabrication techniques, MEMS materials and their properties, MEMS device design and simulation, working principle analysis, MEMS device fabrication sequence, MEMS packaging and assembly, signal testing, MEMS applications (inertial MEMS, MOEMS, BioMEMS, RFMEMS, etc.).

3 semester credits

BIOMEDICAL ENGINEERING 451

Introduction to BioMEMS

This course will introduce to students the fundamentals of BioMEMS, the application of MEMS (Microelectromechanical Systems) for biological applications. The topics include microfabrication, microfluidics, bio-sensors, actuators, micro/nan drug delivery systems, micro total analysis systems and lab-on-a-chip

devices, and detection and measurement systems. The main focus is to understand the fundamental challenges and limitations involved in designing and fabricating various BioMEMS and BioNEMS devices.

3 semester credits

BIOMEDICAL ENGINEERING 500

Graduate Co-op/Internship in Biomedical Engineering

Students will work for a company in a role that is appropriate for an MS-BMEG graduate, or near graduation. Through this experience students will apply biomedical engineering principles and theory in a practical setting. The student will write a paper summarizing the tasks and accomplishments encountered within the organization, as well as make engineering recommendations for improvement of the biomedical engineering process in the company, or division in which s/he was employed. By Arrangement.

1-3 semester hours

BIOMEDICAL ENGINEERING 506 (BMEG 506/MEEG 506)

Transport Phenomena in Biological Systems

This course provides understanding of the physical, chemical and biological processes governing the movement of mass and transmission of forces throughout an organism, which are important to biomedical engineers in the design and operation of biomedical devices. Engineering fundamentals of transport phenomena (fluid flow, heat transfer, and mass transfer) will be discussed in biological applications. Mathematical modeling will be used to analyze the biological transport and biochemical interactions in physiological systems, such as cardiovascular and respiratory systems. Numerical modeling will also be introduced to simulate some biological processes to enhance mathematical understanding.

3 semester credits

BIOMEDICAL ENGINEERING 507

Algorithms in Bioinformatics

This course is tailored for students both in biomedical engineering department and computer science and engineering department desiring to understand the issues concerning representing and analyzing genomes, sequence of proteins etc. The course is about applying the techniques (computational methods and systems) developed in computer science to solve problems in molecular biology such as DNA or protein sequences alignment problem, genome rearrangement problem, protein folding problems and so on. Hidden Markov Models (HMM), Bayesian Model, clustering, decision trees are some of the exam-

Biomedical Engineering

ples of machine learning methods that will be covered in the course.

3 semester credits

BIOMEDICAL ENGINEERING 508 (BMEG 508/MEEG 508)

Biomechanics

Biomechanics is the application of mechanical principles to living organisms that included bioengineering, research and analysis of mechanism in living organisms, and application of engineering principles to and from biological systems. This course can be carried forth on from the molecular level including collagen and elastin, all the way up to the tissue and organ level. Some simple applications of Newtonian mechanics can supply approximations on each level, but precise details demand the use of continuum mechanics.

3 semester credits

BIOMEDICAL ENGINEERING 510 (BMEG 510/ELEG 510)

Medical Machines

This course, provides very good introduction and understanding of Electrical Safety, Medical electronics and Medical Machines as applicable. Students often have different background and level of understanding of technical concepts; therefore we will develop necessary background in this course in first few weeks and gradually move from basic to advance topics as listed below in "Class Topics" section. This course will further help by developing approach to design devices and safety features. Behind every invention, law or device, there is always a need, a necessity. Students go from necessity to invention in the class. Since large number of electronic equipments are being used in hospitals and medical centers for patient care and diagnosis or carry out advanced surgeries. This course will enable students to learn the basics principles of different instruments used in medical science.

3 semester credits

BIOMEDICAL ENGINEERING 511 (BMEG 511/MEEG 511)

Designs and Development of Biomedical Instrument

This course offers the information to understand and design biomedical instruments. Biomedical instruments contains imaging and monitoring the environment, simulation and modeling, instrument testing, bio-sensors and diagnostics, instrument design and development, therapeutic devices, next generation instrument technology, clinical and regulatory, and etc. The in-depth descriptions of design methods for biomedical instrument will be included in the course

3 semester credits

BIOMEDICAL ENGINEERING 512 (BMEG 512/MEEG 512)

Computational Fluid Dynamics (CFD)

Computational fluid dynamics (CFD) is employed in a wide range of industries and disciplines, such as aerospace engineering, automotive engineering, biomedical science and engineering, chemical engineering, civil engineering, power engineering and sports engineering. Practicing engineers are constantly facing extreme challenges to solve complex fluid flow and heat transfer problems using commercial CFD software. To avoid flawed CFD simulation and results interpretation using commercial CFD packages by users with inadequate training, understanding the fundamental principles that underlie commercial CFD solvers can help the users to effectively harness the power of modern CFD for their research or design. This course is intended as an introduction to the scientific principles and practical engineering applications of CFD. It combines lectures on the CFD principles with projects of research or industrial applications. The emphasis of this course is not to teach the theory behind the CFD techniques, but to help the students apply the knowledge gained into practical use of commercial CFD software (COMSOL, ANSYS and/or STAR-CCM+). Students will apply these skills to relevant engineering applications and gain an appreciation of the limitations and advantages of CFD modeling.

3 semester credits

BIOMEDICAL ENGINEERING 513 (BMEG 513/ELEG 513)

Biomedical Image Processing

This course is an elective course. The content of this course include the fundamentals of Digital Image Processing and its applications in biomedical field. Sampling and Quantization of signals are mentioned in order to introduce the digital images, some basic relationship between pixels are mentioned. Introduction to Fourier Transformation, Discrete Fourier Transform and Fast Fourier Transformed are explained. MATLAB programming with Image Processing Toolbox will be introduced to empathize and rigid the understanding of students. Others important fundamental theorems, e.g., Image Enhancement, Image Segmentation, Representation and Description are also mentioned. Students are required to implement some programs using the theorems learnt in classes.

3 semester credits

BIOMEDICAL ENGINEERING 520 (BMEG 520/BIOL 520)

Physiology

The physiological and biochemical principles that control the function of the human body

will be covered. Laboratory work will introduce the student to basic physiologic experimentation, interpretation and presentation of results.

3 semester credits

BIOMEDICAL ENGINEERING 530

Instrumentation and Laboratory Experience

This course can be taken in any semester. Working with the program director, engineering or life science, the students will get permission to enter the relevant lab and formulate an experimental plan with the faculty supervisor of that lab. At the end of the lab experience the student will present their lab notebook for inspection to the lab supervisors and the program director.

3 semester credits

BIOMEDICAL ENGINEERING 535 (BMEG 535/TCMG 535)

Foundations of Biotech Sciences and Management

This course defines biotechnology as the application of molecular biology for useful purposes. It simulates the real world science and business environments: Information and knowledge are complex, highly specific, fragmented, diverse and vast. No one individual or group or business entity or government agency is able to cover in-depth the entire science and business continuum to succeed and create value to society at large. Value creation has three different aspects: data, information and knowledge assimilation, degree of collaboration and methodology to establish successful knowledge management and business processes. The continuum of the biotechnology industry is shaped by scientific, legal, regulatory, social, economic, technological, political, financial and commercial factors. Understanding the dynamics and linked contributions of the interdisciplinary array of factors which affect commercialization of bioscience discoveries is essential to operate in the biotechnology industry. In this course we are dissecting the biotechnology industry to isolate the key drivers and study their interactions.

3 semester credits

BIOMEDICAL ENGINEERING 540 (BMEG 540/BIOL 540)

Advanced Cell and Molecular Biology

The general biological principles that govern all living organisms will be discussed. The structure and function of cells with emphasis on gene activity at the molecular level, DNA replication and repair, transcription, translation, recombination, translocation and mutations. Techniques and experiments leading to important discoveries on DNA will be covered.

3 semester credits

Biomedical Engineering

BIOMEDICAL ENGINEERING 541 (BMEG 541/TCMG 541)

Foundations of Biotechnology and Bioentrepreneurship

In this course we are dissecting the biotechnology industry to isolate the key drivers and study their interactions. Discoveries in science and fast developments in technology combined with financial availabilities offer many entrepreneurial opportunities.

3 semester credits

BIOMEDICAL ENGINEERING 546 (BMEG 546/ELEG 546)

Biosignal Processing

This is an introductory course in Bio-Signal Processing (DSP) for graduate Electrical and Computer Engineering students. Sometime will be spent initially reviewing major concepts in signals and systems. Major topics to be covered in ELEG 546 include: Concepts of signal and image processing, wavelets, classification and clustering, and applications of these concepts to EEG, ECG, EMG, MRI and CT Scans.

3 semester credits

BIOMEDICAL ENGINEERING 560 (BMEG 560/MEEG 560)

Advanced Tissue Engineering

This course deals with specific elements of tissue engineering design and analysis. approaches to the regeneration of three tissue systems will be analyzed utilizing engineering design. Concepts ranging from tissue development and dynamic growth conditions to ultimate tissue properties will be addressed. Students will be required to acquire understanding and expertise from analysis of primary literature and will complete group presentations on directed approaches to tissue design and engineering in three tissue systems. To ensure in-depth understanding of different aspects of tissue engineering the groups will be required to focus on one or two key aspects in each mini design module.

3 semester credits

BIOMEDICAL ENGINEERING 561 (BMEG 561/ELEG 561)

Fundamental Analysis of Nanomaterials

The course will give an overview on several important analytical tools for nano materials characterization. Mechanical, electrical and electronic and biological property testing of the nano materials such as carbon nanotubes, metal nanoparticles, quantum dots, nanowires conformable nanoelectronics materials, polymer nanoparticles and biomedical nanomaterials will be discussed. Process and product evaluation by physical, chemical and microscopic methods for materials in nano-regime will be highlighted. Modern materials science depends on the use of a battery of analytical methods carried normally in specialized laboratories. This course explains the fundamental

principles associated with the various methods and familiarize the students with them, their range of applicability and reliability especially when materials are of nanoscopic dimension.

3 semester credits

BIOMEDICAL ENGINEERING 562 (BMEG 562/ELEG 562)

Nanofabrication with Soft Materials

This is an advanced level graduate course focusing on fabrication of soft materials. Nanofabrication processes and nanosystem products will be discussed. Fundamentals associated with chips fabrications and linking them toward soft materials assembly will be detailed. Emerging nanotechnology based methods for soft and green electronics, mechanical parts, MEMS, PCBS will be covered. Gene chip, label free sensory assay using micro and nanofluidics will be discussed. Transfer printing, DNA-protein interactions using the chip and several nano-scale assemblies for soft materials fabrication will be discussed.

3 semester credits

BIOMEDICAL ENGINEERING 565 (BMEG 565/ELEG 565)

Biomedical Materials and Engineering

This course introduces the students with the progress of biomaterials used in biomedical engineering. Starting from early civilizations biomaterials this course discusses modern advanced level biomaterials and their engineering principles associated with their biomedical use. Hip, knee Prostheses, implants, grafts, sutures, stents, catheters materials and their application in Biomedical Engineering are covered. Designed biomaterials such as silicones, polyurethane, Teflon, hydrogels, bionanocomposites are detailed. Modern Biology and biomedical engineering such as protein absorption, biospecific medical materials, nonfouling materials, healing and foreign body reaction, controlled release etc are discussed. Surface-immobilized biomolecules in patterned surfaces are explained with specific examples of the use of immobilized biomolecules, immobilized cell ligands, and immobilization methods. Recent advances in biomedical engineering from the perspectives of inkjet printing of cells and tissues for 3D-medical textiles, nanofibers and films in biomedical engineering by electrostatic spinning, bio-inspired materials through layer by layer (LBL) assembly and biogels and advanced instrumentations in biomedical engineering are updated. Artificial red blood and skin substitutes, orthopedic biomaterials applications adhesives and sealants, diagnostics, biomedical sensors, extracorporeal artificial organs and ethical issues of biomedical engineering are discussed.

3 semester credits

BIOMEDICAL ENGINEERING 569 (BMEG 569/MEEG 569)

Advanced Biomedical Materials and Engineering

This course will cover the advanced level understanding on the different types of biomaterials using in medical purposes and their design. Modern biology in biomedical engineering such as but not limited to protein absorption, immuno isolation, regenerative medicine etc will be covered. Ethical issues in biomedical engineering will be discussed. Cutting edge research on nanobiotechnology that extends to biosensors, 3D biomatrix, advanced diagnostic, dental composites, sealants, adhesives will be covered. Device fabrication aspect of biomedical engineering especially that are at the interface of nanotechnology and biomaterials will be thoroughly discussed.

3 semester credits

BIOMEDICAL ENGINEERING 571 (BMEG 571/MEEG 571)

Ethical Issues in Biomedical Research

This course will be offered as a one hour discussion with a group of students in the instructor's office keeping in mind the ethical issues dealing with Biomedical Engineering. Health concerns on handling nanobiomaterials, laws and bylaws associated with human subjects and the Food and Drug Administration's requirements will be discussed. Hence creating an ethical awareness associated with Biomedical Engineering.

3 semester credits

BIOMEDICAL ENGINEERING 580

Tissue Engineering

The objective of this course is to provide students a foundation for the understanding of cell based systems needed for tissue engineering. The structure-property-function relationships in normal and pathological mammalian tissues will be covered. A review of the current development of biological substitutes to restore, maintain, or improve functions that includes strategies to regenerate metabolic organs and repair structural tissues, as well as cell-based therapies to deliver proteins and other therapeutic drugs will be discussed. There are a variety of very important materials issues in tissue engineering, which will be discussed in detail. Cells adherence to the extracellular matrix materials in the body and their enormous effect on cell behavior will be detailed. The physical and chemical properties of these materials will be examined and important materials used in tissue engineering will be discussed.

3 semester credits

BIOMEDICAL ENGINEERING 620

Team Based Research Project

This course must be taken in your last se-

Biomedical Engineering • Business Capstone • Business Communications • Business Law • Chiropractic

mester of course work or later. This is a team based project. Teams with members from both the life sciences and the quantitative sciences are strongly encouraged. You may have more than one advisor, but one faculty member needs to be identified as the primary advisor. Your capstone project may be based on a single project or multiple projects. Each project, however, must be experimental or simulation in nature and be interdisciplinary. The project results should be publishable in peer reviewed journals. All projects must be approved by the University's BME program committee prior to student enrollment in the BME 620 course.

Business Capstone

BUSINESS CAPSTONE 597

Integration and Application: Strategy

This is a capstone course dealing with the development and implementation of business strategy and planning within a framework of ethical decision-making, globalization and managing accelerating change. The student is tested on his/her capability to apply all prior learning to solve actual strategic management problems. The final project of this course is project-based, and shall constitute an outcome assessment of what the student has learned in the MBA program. This project, normally an extensive and comprehensive case study, will be graded by several faculty members representing different and relevant disciplines. Prerequisites: Completion of all core and required courses and completion of all Major courses or concurrent registration with final Major courses. Normally, students enroll toward the end of their MBA program.
3 semester credits

BUSINESS CAPSTONE 595

Independent Study

This course is reserved for a special project that cannot be done in any other course format and is intended to allow a student complete his/her MBA requirements. Students will study a topic approved by their professor and present a substantial written report regarding the topic. Prerequisite: Completion of core courses and required Major courses. Written approval to register by the supervising professor and the Assistant Dean are required. This course is normally taken towards the end of the student's MBA program.
3 semester credits

BUSINESS CAPSTONE 598

Integration and Application: Thesis

Students will complete a report based on field, library and institutional research to demonstrate ability to conduct investigations in a managerial discipline. The topic of the report may concern any business issue, industry or organization and may be related to the student's current or future employment. Prerequisites: Completion of all Major courses or concurrent registration with final Major courses. This course should be taken in the final semester of a student's MBA program and approval of the student's faculty advisor is required.
3 semester credits

BUSINESS CAPSTONE 599

Integration and Application: Internship

This course should be taken towards the end of the student's program of study and requires the approval of the student's faculty advisor.
3 semester credits, 1 semester credit, 1 semester credit

Business Communications

BUSINESS COMMUNICATIONS 400

Business Written Communications

The purpose of this course is to improve the ability of students to effectively communicate with a variety of writing techniques. Students will not only learn and practice grammatical principles, but also learn to present tables and graphs, and to organize and coherently structure their written reports. Prerequisites: Admission to graduate study.
3 semester credits

Business Law

BUSINESS LAW 400

Legal Environment of Business and Ethics

Students course focuses on how the legal environment of business impacts business decisions with broad ethical, international, and critical thinking examples throughout. Knowledge of the legal aspects of running a business will enable the student to conduct business within the legal framework and understand the ethical dimension of business decisions. Topics include: Introduction to Business Ethics and the Judicial and Legislative Process; Litigation, Alternative Dispute Resolution, and the Administrative Process; Business Crimes, Torts, and Contracts; the Constitution and Government Regulation of Business; Business Organizations; Employment and Labor Laws; Consumer Protection and Environmental Regulation;

and International Law and Ethical Conflicts. Prerequisites: Admission to graduate study.
3 semester credits

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Anatomy

AN511

Cell and Tissue Microscopic Anatomy and Physiology

This course will focus on the study of the microscopic anatomy and physiology of cells and basic tissue type. A major emphasis will be placed on connective, neural and muscular tissue. A working knowledge of the microscopic structure and function of the basic tissue types will provide a framework for understanding how the organization of the tissue contributes to organ and organ system physiology.
3 lecture hours, 3 semester hours

AN512

Functional Anatomy and Biomechanics I: Spine

This course addresses the functional anatomy and biomechanics of the spinal column, ribs and pelvis. Emphasis is placed on the interrelationships between the structure and function of the spinal column and its surrounding anatomical structures. Biomechanical principles are incorporated into functional anatomy of a dynamic human musculoskeletal system. Instruction includes lecture, dissection, tutorials, prosection and models
3 lecture hours, 3 laboratory hours, 4.5 semester hours

AN513

General Anatomy I: Viscera

This course focuses on the anatomy of the organs plus the structure of the muscles, bones and additional tissues of the walls of the human thoracic and abdominopelvic cavities. The neurological, vascular and positional relationships of these organs are discussed with emphasis on the clinical applications. Instruction includes lectures and laboratory with dissection and prosection, osseous structures and models.
3 lecture hours, 3 laboratory hours, 4.5 semester hours

AN514

Clinical Embryology

Embryology covers the gametogenesis, fertilization and structural development from the zygote to birth. This course correlates the embryological development with other courses

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offered in Semester I. Normal development, clinical correlations and common congenital abnormalities are presented. Emphasis is placed on the skeletal, muscular and nervous systems.
1 lecture hour, 1 semester hour

AN525

General Anatomy II: Head and Neck

This course focuses on the anatomy of the head, including the gross anatomy of the brain and special sense organs, and neck. The neurological and vascular relationships of these regions are discussed with emphasis on clinical applications. Instruction includes lectures, laboratory dissection and prosection and models. Prerequisites: AN511, AN512, AN513, AN514.

3 lecture hours, 3 laboratory hours, 4.5 semester hours

AN526

Functional Anatomy and Biomechanics II: Extremities

This course is a regional exploration of the appendicular system. Bones, muscle attachment and function, vasculature and innervation are discussed. Emphasis is on understanding function based on attachment and innervation. Relevant clinical problems are presented. Instruction includes lecture, full dissection of pectoral girdle, pelvic girdle, and extremities, presentation of prosections, study of bones and models. Prerequisite: AN513.

3 lecture hours, 3 laboratory hours, 4.5 semester hours

Biochemistry

BC511

Biochemistry, Metabolism and Nutrition: I

This course is designed to provide the student with an understanding of the biochemical principles involved in maintaining functional integrity of the body through energies and the principles involved in nutritional balance.

2 lecture hours, 2 semester hours

BC612

Biochemistry, Metabolism and Nutrition: II

This course is a continuation of BC511. Prerequisite: BC511

2 lecture hours, 2 semester hours

Business Procedures

BP721

Documentation and Insurance Protocols (Billing and Coding)

The successful student will be able to identify and discuss all of the important aspects of pa-

tient communication, medical documentation and insurance protocols/coding. In addition, the successful student will be able to identify and apply appropriate billing protocols regarding filing insurance claim forms

1 lecture hour, 1 credit hour

BP722

Business Procedures and Marketing

This is a business procedures course that stresses the importance of ethical and legal business management procedures. The class room discussions cover strategic management, chiropractic and health care economics, marketing and image building. Successful completion will prepare the student to enter chiropractic practice.

1 lecture hour, 1 credit hour

BP813

Starting a Chiropractic Practice and Office Management

At the completion of this course, the successful student will have a clear understanding and knowledge of the three basic choices when starting a chiropractic practice. They will also recognize their options related to selecting a business structure as well as being able to identify the type of practice they want to establish, the key factors for establishing a workable partnership, the importance of obtaining financing, finding a location, designing an office floor plan, preparing a business and budget plan, hiring and managing employees/office staff, managing patients regarding payment and collection issues and recognizing key items related to both internal and external marketing/advertising. In addition, the successful student should be able to recognize the different types of health insurance and manage care plans typically encountered in a chiropractic office as well as the importance of obtaining access into these insurance networks. Finally, the successful student should recognize the importance of the report of findings, HIPPA (Federal) guidelines and basic hospital protocols.

1 lecture hour, 1 credit hour

Chiropractic Skills and Technique

TE511

Chiropractic Examination Skills I: Palpation and Biomechanics of the Spine and Pelvis

This course addresses the biomechanics and chiropractic assessment procedures of the spinal and pelvic joints. The student is introduced to the concepts of biomechanics as they relate to the kinematics and kinetics of the spine and pelvis and the structure and functioning of the

tissues of the musculoskeletal system.

2 lecture hours, 2 semester hours

TE511L

Chiropractic Examination Skills I: Palpation and Biomechanics of the Spine and Pelvis - Laboratory

Clinical biomechanics and associated chiropractic assessment procedures of the spine and pelvis are presented and practiced. Emphasis is placed on the diagnostic tools of inspection as well as static and motion palpation as they pertain to the assessment of spinal/pelvic joint functioning.

3 laboratory hours, 1.5 semester hours

TE522

Chiropractic Examination Skills II: Palpation and Biomechanics of the Extremities

Clinical biomechanics and associated chiropractic assessment procedures of the upper and lower extremities and TMJ are presented and practiced.

2 lecture hours, 2 semester hours

TE522L

Chiropractic Examination Skills II: Palpation and Biomechanics of the Extremities Laboratory

Clinical biomechanics and associated chiropractic assessment procedures of the upper and lower extremities and TMJ are presented and practiced. Previously learned spinal assessment procedures are reviewed and practiced. Prerequisites: TE511L, Co-Requisite AN526

3 laboratory hours, 1.5 semester hours

TE613

Technique Procedures I: Introduction to Full Spine Technique Lecture

This course introduces students to full spine adjustive procedures from the cervical spine (C2) to the pelvis. The course will begin with a review of biomechanics and assessment procedures presented in palpation skills TE522 and TE511. Selected spinal conditions will be presented and discussed as they pertain to diagnosis, differential diagnosis and case management. Prerequisites: AN512, TE511 and TE522

1 lecture hour, 1 semester hour

TE613 LAB

Technique Procedures I: Introduction to Full Spine Technique Laboratory

This course introduces students to full spine adjustive procedures from the cervical spine (C2) to the pelvis. This course will begin with a review of biomechanics and assessment procedures presented in palpation skills AN512 and TE511. In addition, this course will concentrate on the psychomotor skills required to perform the specified spinal adjustments from cervical spine

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(C2) to the pelvis. Prerequisites: AN512, TE511L
3 laboratory hours, 1.5 semester hours

TE624

Technique Procedures II: Intermediate Full Spine and Upper Extremity Adjusting

Principles of patient management and common clinical conditions of the head, neck, thoracic and upper extremity regions are presented. Evidence-based diagnostic and treatment protocols are stressed along with conservative and proper referral and co-management. Prerequisites: TE613, DX611, DX612, TE522L, DX611L, DX612L

2 lecture hours, 2 semester hours

TE624L

Technique Procedures II: Intermediate full Spine and Upper Extremity Adjusting Laboratory

The laboratory portion is a review and practice of new and previous techniques taught with an emphasis on skill refinement. Intermediate level spinal techniques and upper extremity techniques are presented and practiced. Prerequisite: TE613L, TE522L

4 laboratory hours, 2 semester hours

TE625

Technique Procedures III: Soft Tissue

Students are introduced to the concepts of soft tissue diagnostic procedures and treatment procedures. These include the etiology, pathophysiology, diagnosis and treatment of soft tissue dysfunction and trauma, differential diagnosis and case management of soft tissue dysfunction and trauma, differential diagnosis and case management of soft tissue lesions are presented. Prerequisites: TE511, 511L, TE522, 522L, TE613, AN512, AN526, NS612

2 lecture hours, 2 semester hours

TE625L

Technique Procedures III: Soft Tissue Laboratory

The laboratory portion covers the diagnosis and treatment of muscle hypertonic states. Prerequisites: TE613L, TE522L

2 laboratory hours, 1 semester hour

TE716

Technique Procedures IV: Intermediate Full Spine and Lower Extremity Technique

Clinical biomechanics of the lumbopelvic region and lower extremities are reviewed. Evidence-based differential diagnosis and case management of lumbopelvic and lower extremity clinical conditions common to chiropractic practice are presented and discussed. Prerequisites: TE624, TE624L

2 lecture hours, 2 semester hours

TE716L

Technique Procedures IV: Intermediate Full Spine and Lower Extremity Technique Laboratory

Intermediate level full spine and lower extremity assessment and manipulative procedures are presented and practiced. Students continue to review and practice previous technique procedures. Prerequisite: TE624L

4 laboratory hours, 2 semester hours

TE717L

Technique Procedures V: Soft Tissue II

This course will begin by reviewing soft tissue techniques taught in TE625/TE625L. Students then refine their palpatory and therapeutic soft tissue manual treatment skills. Prerequisite: TE625L

2 laboratory hours, 1 semester hour

TE728

Technique Procedures VI: Advanced Chiropractic Technique I

Advanced patient assessment procedures and application of technique procedures to different patient populations are presented and discussed. Upper cervical toggle recoil, instrument adjusting and temporomandibular joint, symphysis pubis, coccyx and rib techniques are introduced. Chiropractic management of extremity conditions is presented and discussed. Prerequisite TE716

2 lecture hours, 2 semester hours

TE728L

Technique Procedures VI: Advanced Chiropractic Technique I Laboratory

Previous patient assessment and technique procedures for the spine and extremities are demonstrated and practiced. Advanced spinal and extremity techniques are introduced and practiced. Upper cervical toggle recoil, pelvic blocking, instrument adjusting, cervical and lumbar mobilization techniques, TMJ, symphysis pubis, coccyx and rib techniques are introduced and practiced. Selected soft tissue techniques are reviewed and practiced. Prerequisite: TE716L

4 laboratory hours, 2 semester hours

TE819

Technique Procedures VII: Advanced Chiropractic Technique II

This course is the combined lecture and laboratory review of all techniques taught at UBCC. This course also serves as a critique course for other techniques utilized in practice. Case management utilizing various chiropractic technique approaches are discussed and critically evaluated. Prerequisite: all courses Semester I-VI

1.5 lecture hours, 3 laboratory hours, 3 semester hours

Clinical Nutrition

CN621

Clinical Nutrition I: Pathology and Assessment

This course introduces the student to diet, basic nutrition and vitamins and their clinical applications. There is an emphasis on the clinical aspects of the diet and the diseases associated with the typical American diet. Additionally, the biochemistry of carbohydrates, fats and proteins is reviewed, focusing on the use of fats, amino acids and vitamins to treat various diseases and pathological states. Prerequisites: PH612, BC612, PA611.

1 lecture hour, 1 semester hour

CN712

Clinical Nutrition II: Treatment and Management

This course is a continuation of CN621. There is a comprehensive review of minerals and their clinical application, as well as the clinical uses of fiber. The pathophysiology of obesity, Alzheimer's disease, atherosclerosis, diabetes mellitus, osteoarthritis and detoxification are discussed in length, as well as treatment protocols for each condition using nutritional supplements, herbs, diet and homeopathic medicines. Prerequisite: CN621

2 lecture hours, 2 semester hours

Clinical Services

CS721

Clinical Services I

Students under the supervision of licensed faculty begin to administer care to patients at the UBCC Health Center. Students are introduced to the procedures and practices utilized by the health center through lectures and practical demonstrations. Students refine their skills in history taking, physical examination, radiology, technique, case management and clinical decision-making. Prerequisites: all courses in semesters I-V.

2 lecture hours, 4 clinic hours, 4 semester hours

CS812

Clinical Services II

Under supervision of licensed faculty, interns administer care to patients. All patient diagnoses and management plans are reviewed and approved by a clinic faculty member prior to the initiation of patient care. Students are assessed via evaluation by faculty. Prerequisite: All course semesters I-VI

25 clinic hours, 12.5 semester hours

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CS823

Clinical Services III

Interns continue to administer care to patients under the supervision and approval of licensed faculty. Interns are monitored as to their progress towards completing the qualitative and quantitative requirements as set forth by the UBCC Health Center. Assessment of an intern's clinical competency is performed by faculty. Prerequisite: All course semesters I-VII.

25 clinic hours, 12.5 semester hours

CS824

Clinical Services IV

Interns continue to administer care to patients under supervision of faculty. Progress is monitored by faculty. This clinical experience is presented during the summer for six weeks. Prerequisites: All courses Semesters I-VI

25 clinic hours, 4 semester hours

Diagnosis

DX611

Diagnostic Skills I: Physical Examination

This course is designed as an introduction to the skills required to examine, diagnose and differentially diagnose the skin, eyes, ears, nose, sinuses, mouth, throat and thyroid as well as the cardiovascular, respiratory, gastrointestinal and genitourinary systems. In addition, selected topics regarding the diagnosis of the musculoskeletal system will also be covered. The student will review basic anatomy and physiology as well as anatomical structures as it relates to physical examination procedures being taught and specific organ systems being examined. The student will also learn the selection of appropriate examination and diagnostic procedures which correspond to the patient's history and complaint. They will be introduced to the skills as they relate to history taking as well as guidelines for appropriate record keeping and progress notes. The successful student will learn how to select and use their diagnostic equipment and procedures for carrying out these examinations. Integration of these skills into the comprehensive management of the patient will be emphasized which will allow the student to properly develop the clinical decision-making skills necessary to demonstrate minimum clinical competency. Prerequisites: AN511, AN512 and AN525, AN513

2 lecture hours, 2 semester hours

DX611L

Diagnostic Skills I: Physical Examination: Laboratory

This practical laboratory course is designed

as an introduction to the psychomotor skills required to examine, diagnose and differentially diagnose the skin, eyes, ears, nose, sinuses, mouth, throat, thyroid, cardiovascular, respiratory, gastrointestinal and genitourinary systems. The student will review basic anatomy and physiology as well as anatomical structures as it relates to physical examination procedures being taught and specific organ systems being examined. The students will expand upon their knowledge and skills as it relates to history taking. The students will also learn the selection of appropriate examination and diagnostic procedures, which correspond to the patient's history and complaint as well as recognize the importance of the review of systems and the development of a problem list. The successful student will learn how to select and use their diagnostic equipment and specific procedures for carrying out these examinations. Integration of these skills into the comprehensive management of the patient will be emphasized which will allow the student to properly develop the clinical decision-making skills necessary to demonstrate minimum clinical competency. Prerequisites: AN511, AN513, AN525

3 laboratory hours, 1.5 semester hours

DX612/612L

Diagnostic Skills II: Orthopedics and Neurology

This lecture and laboratory course emphasizes the use of evidenced-based orthopedic and neurological evaluation procedures. Students are introduced to an organized clinical thought process that prepares them to perform appropriate evaluation procedures of patients presenting with neuromusculoskeletal conditions. The entire SOAP process is taught in order to enable the student to expedite the examination process, reveal subjective and objective findings, create an accurate diagnosis and generate comprehensive record keeping. Prerequisites: AN526, TE522, PP524

2 lecture hours, 2 semester hours, 4 laboratory hours, 2 semester hours

DX623

Diagnostic Skills III: Orthopedic and Neurology

The lecture portion of this course covers common diseases and conditions of the neurological system.

2 lecture hours, 2 semester hours

DX623L

Diagnostic Skills III: Orthopedic and Neurology Laboratory

The laboratory portion presents cases that challenge the student to consider the evaluation and management process of specific neu-

rological conditions. Practical application of neurological and orthopedic testing prepares the student to organize their critical skills. Students, through a problem-based format, develop the clinical reasoning skills to differentiate conditions affecting the neuromusculoskeletal system.

4 laboratory hours, 2 semester hours

DX624

Laboratory Diagnosis

This course introduces the student to the appropriate ordering and interpretation of laboratory tests. Prerequisites: DX613, PH612, PA611

3 lecture hours, 3 semester hours

DX725

Special Populations

This course introduces the student to the health care needs of the developing child and mother from conception to birth to childhood and adolescence. Complications of pregnancy, delivery, post partum care and the chiropractic management of the obstetrical patient will be discussed. The examination and conditions of the pediatric patient as well as the management of the pediatric patient is presented.

Also covered is the examination of the geriatric patient, common findings of the geriatric exam and management of selected neuromusculoskeletal and non-neuromusculoskeletal conditions. Prerequisites: all courses in semesters 1-V.

3 lecture hours, 3 semester hours

Differential Diagnosis

DD711

Differential Diagnosis I: Internal Disorders

This course presents the diagnosis and differential diagnosis of diseases and conditions affecting the internal organs, to include the cardiovascular system, pulmonary system, gastrointestinal, genitourinary system, gynecological and integumentary systems. This course reviews the concept of how these systems can refer pain to, and affects the functioning of, the neuromusculoskeletal system, and how the neuromusculoskeletal system can affect these systems. The management of disease and conditions affecting these systems is covered.

5 lecture hours, 5 semester hours

Prerequisites: All courses semesters I - IV

DD711L

Differential Diagnosis I: Internal Disorders Laboratory

The laboratory reviews examination procedures related to these areas and presents case studies to assist students in developing clinical reasoning skills. Prerequisites: All courses - Se-

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mesters I-IV

DD722

Differential Diagnosis II: Neuromusculoskeletal

This course is a presentation of the diseases and conditions affecting the neuromusculoskeletal system. Disorders affecting the spine, extremities and central and peripheral nervous system are reviewed. Neurological and orthopedic testing are covered as they relate to the differential diagnosis of these systems. Functioning of the human locomotor system and how other systems can affect this is stressed. Prerequisites: All courses, Semesters I-V

4 lecture hours, 4 semester hours

Emergency Procedures

ER 711

Emergency Procedures

Training in first aid principles is given in lectures and demonstrations dealing with the care of emergencies and accidental injuries. Treatment of wounds, fractures, poisoning, lacerations, shock, hemorrhages, heat exhaustion, drowning and burns are taught. Students are trained and receive certification in the administration of CPR. *1 lecture hours, 2 laboratory hours, 2 semester hours*

Microbiology and Public Health

MB521

Clinical Microbiology I: Introduction to Infectious Diseases

This course introduces the student to the basic concepts of microbiology with emphasis on the structure, growth, metabolism and genetics of bacteria. Host-parasite relationships of representative bacterial, fungal, viral and protozoan pathogens are examined. A survey of microbial diseases includes modes of transmission, symptoms, diagnosis, physical and chemical methods of disinfection, sterilization and treatment. Presentations include lecture, laboratory and case studies. Prerequisites: BC511, AN511 *2 lecture hours, 2 semester hours*

MB612

Clinical Microbiology II: Infectious Diseases

This course is a continuation of MB521. Common infectious diseases are presented from a microbiological perspective. Prerequisite: MB521, PH521 *2 lecture hours, 2 semester hours*

MB623

Public Health I: Introduction to Public Health and Epidemiology

This course covers the current environmental

and public health concerns and issues. The course integrates health with diet, air and water pollutants, nose and substance abuse, compares community hygiene and industrial hygiene, defines epidemiology and recognition of major communicable and non-communicable disease. Prerequisite: MB612.

2 lecture hours, 2 semester hours

MB724

Public Health II: Community Health and Wellness

This course teaches students about wellness and health promotion consistent with Healthy People 2020 from the US government. Students will learn health problem methods to use in practice that stress patient self care behaviors that can impact on mortality due to preventable causes, especially: cardiovascular disease, stroke, cancer and diabetes. These behaviors include diet, exercise, and smoking cessation, moderation of alcohol intake and reduction of drug usage. Prerequisite: MB623 *2 lecture hours, 2 semester hours*

Neuroscience

NS521

Neuroscience I

This course is an overview of the general anatomy of the central nervous system. The gross anatomical structures of the brain and central nervous system are presented. Basic neurophysiology and neural cellular anatomy are discussed. The structures of the sensory, motor and special sense systems and pathways are presented. Reading and case examples are used to emphasize the neuroanatomical correlation to selected clinical scenarios. Prerequisites: AN511, AN512, AN513, AN514, AN525 *3 lecture hours, 3 semester hours*

NS612

Neuroscience II

This course is a continuation of NS521 and will begin to emphasize the neuroscience of clinical case-based problems. The sensory and motor systems are examined in detail. An emphasis is placed on the correlation of anatomical structure to physiological function and to contrast this to clinical problems. Prerequisites: NS521, PP524, PH521, AN525 *3 lecture hours, 3 semester hours*

Pathology

PA611

Fundamentals of Pathology

This course is a study of the pathophysiological process and how this process alters the

gross, microscopic and clinical manifestations of disease. The basic pathological process of inflammation, repair, degeneration, necrosis, immunology and neoplasia is presented. This course is also an introduction to disease of the lymphatic, bone marrow and neuromusculoskeletal system. Laboratory includes the study of gross and microscopic changes as well as clinical presentation of various diseases and functional disturbances. Prerequisites: All anatomy courses, PH521

2 lecture hours, 1 laboratory hour, 2.5 semester hours

PA622

Systems of Pathology

This course is a continuance of the study of the pathological processes of various diseases. This course emphasizes the pathological basis of systemic diseases of the cardiovascular, respiratory, gastrointestinal, urogenital, endocrine, hepatobiliary, renal and pancreatic systems. The gross microscopic and clinical manifestations of various disease processes are presented. Prerequisites: PA611, Corequisite PH612.

4 lecture hours, 1 laboratory hour, 4.5 semester hours

Physiological Therapeutics

PT711/PT711L

Physiological Therapeutics I: Modalities

This course is an introduction to the physics and clinical use of heat, cold, high volt galvanism, interferential current, low volt galvanism, ultrasound, electrical muscle stimulation, diathermy and paraffin. This student is instructed on the development of a clinical management plan utilizing adjunctive therapies. In lab, students are introduced to the use and application of modalities.

1 lecture hour, 1 semester hour/2 laboratory hours, 1 semester hour

PT722

Physiological Therapeutics II: Rehabilitation

This course covers the concepts of rehabilitation as used in the UBCC Health Center and in private practice. The course covers the rehabilitative management of injuries and clinical conditions of the spine and extremities common to the practice of chiropractic.

2 lecture hours, 2 semester hours

PT722L

Physiological Therapeutics II: Rehabilitation Laboratory

The laboratory course introduces rehabilitative treatment methods including stretching, balance training, therapeutic and spinal stabilization

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tion exercise. Prerequisite: PT711
2 laboratory hours, 1 semester hour

Physiology

PH521

Organ System Microscopic Anatomy and Physiology I

This class will focus on understanding the microscopic anatomy and physiology of the organs of the immune and endocrine systems. Major emphasis will be placed on the role of non-specific and specific defense mechanisms in health maintenance and provide an introduction into immune system disruption as it relates to hypersensitivity and autoimmunity. The endocrine system will be studied in its primary role in cellular communication and maintenance of homeostasis. Special emphasis will be placed on the interaction and communication between the nervous and endocrine systems. Prerequisites: AN511, BC511
2 lecture hours, 2 semester hours

PH612

Organ System Microscopic Anatomy and Physiology II

The microscopic anatomy and physiology of the cardiovascular, respiratory, urinary, digestive and reproductive systems will be studied in this class. An emphasis will be placed on the relationship of tissue organization and function of the organ systems. Laboratories in this class will utilize case studies to emphasize how an understanding of normal physiologic mechanisms is crucial to understanding pathophysiology. Prerequisites: AN511, AN513, BC511, PH521
4 lecture hours, 2 laboratory hours, 5 semester hours

PH713

Toxicology and Pharmacology

This course is the study of drugs and chemicals and how they interact with the living organism. Pharmacology is a study of the sites, absorption and metabolism of common drugs. Toxicology studies the adverse reactions of drugs and poisons. The therapeutic use and toxic side effects of various drugs, chemicals, nutritional supplements and other substances are studied. Prerequisites: PH612, PA622, NS612, BC612
2 lecture hours, 2 semester hours

Principles and Practice

PP511

Principles and Practice I: History and Philosophy

This is a course in which the history of heal-

ing is traced from its known origins through discovery of chiropractic to the present day. The basic concepts of chiropractic philosophy are discussed, as well as their current interpretation and clinical significance. Particular emphasis is placed upon chiropractic as a distinct profession in the health care community.
2 lecture hours, 2 semester hours

PP512

Principles and Practice II: Introduction to Evidence-Based Practice

Students will learn the steps involved in Evidence-Based Chiropractic practice: Creating focused clinical questions, efficiently finding, and then assessing evidence for relevance and validity, applying it ethically (alongside clinical wisdom and patient preferences) to a clinical question, then reflecting upon your mastery of the process. This course will build the foundation for an ongoing commitment to inquiry which will support your future clinical decisions and patient care.
2 lecture hours, 2 semester hours

PP523

Principles and Practice III: Contemporary Chiropractic Studies

Historical and contemporary principles of the chiropractic profession are introduced and discussed. Components of the subluxation complex are presented, critically analyzed and incorporated into the science, art and philosophy of contemporary chiropractic practice. Current events regarding chiropractic and health care are presented and discussed. Prerequisite: PP511
2 lecture hours, 2 semester hours

PP624

Principles and Practice IV: Evidence-Based Practice

In this course, students will expand their knowledge of evidence-based practice. The course emphasizes asking clinical questions, searching for the scientific literature to answer those questions and critically appraising that research. Having found valid research to answer the clinical questions, students will learn how to use that information in clinical practice. Prerequisite: PP512
2 lecture hours, 2 semester hours

PP715

Principles and Practice V: Ethics

This is a risk management course that stresses the importance of ethical and legal business management procedures. Students learn risk management, jurisprudence, ethics and the informed consent process. Successful completion will prepare the student to practice as an

ethical health care provider.
1 lecture hour, 1 credit hour

Psychology

PS711

Clinical Psychology

This course is designed to familiarize the student with current psychological theory and practice. The student is instructed in behavioral assessment and the recognition of psychological disorders. Interviewing and counseling techniques are presented as well as the criteria for appropriate referral of patients to providers of psychological services.
2 lecture hours, 2 semester hours

Radiology

DI521

Diagnostic Imaging I: Normal Anatomy

This course introduces students to normal spinal anatomy including the skull and pelvis. In addition, the students will learn about some abnormal conditions such as scoliosis and spondylolisthesis. Concepts, as they relate to imaging formation, film interpretation and report writing are introduced.
2 lecture hours, 2 laboratory hours, 3 semester hours

DI612

Diagnostic Imaging II: Normal Anatomy

This course is a continuation of DI521. Students continue to develop their skills of radiographic interpretation as they relate to normal anatomical structures of the various parts of the body. Emphasis is placed on the radiography of normal anatomical structures of the extremities and chest. Prerequisite: DI521
1 lecture hour, 2 laboratory hours, 2 semester hours

DI623

Diagnostic Imaging III: Bone Pathology

This course introduces students to the clinical and radiographic manifestations affecting osseous structures due to neoplasia, such as tumor-like conditions, infection and normal variants. Students are introduced to special imaging as it relates to further evaluation of these conditions. Prerequisite: DI612
2 lecture hours, 2 laboratory hours, 3 semester hours

DI714

Diagnostic Imaging IV: Arthritis and Trauma

This course further develops the students' skills in the clinical and radiographic manifes-

Chiropractic • Computer Engineering

tation of osseous structures. Emphasis in this course is placed on the interpretation and recognition of disorders due to inflammatory and non-inflammatory arthritis and trauma. Special imaging as they relate to further evaluation of these conditions is presented. Prerequisite: DI623.

2 lecture hours, 2 laboratory hours, 3 semester hours

DI725

Diagnostic Imaging V: Chest and Abdomen

This course covers the interpretation of normal and abnormal clinical and radiographic manifestations of the internal organs. The chest, heart and abdomen are studied on plain film as well as special examination procedures. Prerequisite: All previous DI courses.

1 lecture hour, 2 laboratory hours, 2 semester hours

DI726

Diagnostic Imaging VI: Positioning and Physics

This course covers the mechanics of x-ray production, film processing, x-ray factors and radiation safety and protection for doctor and patient. Also covered is the placement and positioning of patients for the taking of x-ray studies. Students are introduced to the policies and procedures utilized by the UBCC Health Center.

2 lecture hours, 2 laboratory hours, 3 semester hours

DI827

Diagnostic Imaging VII: X-Ray Review

This course discussed the radiographic presentation of osseous pathologies that clinicians may see in field practice. Review of previous and introduction of new conditions is the goal. A more in-depth study of advanced imaging (with focus on MRI) of the areas often clinically discussed is presented. Prerequisites: All courses: Semesters I-VI.

2 laboratory hours, 1 semester hour

Research

RS711

Evidence Based Practice I

This online learning course will utilize previously taught material and evidence-based practice methods in the creation of a comprehensive case report on a fictitious patient. An emphasis is placed on chiropractic principles and techniques as patient management strategies are created. Prerequisite: PP512, PP624

1 lecture hours, 1 semester hour

RS722

Evidence Based Practice II

This online learning course will utilize pre-

viously taught material and evidence-based practice methods in the creation of a comprehensive case report on a fictitious patient. An emphasis is placed on chiropractic principles and techniques as patient management strategies are created. Prerequisite: RS711

1 lecture hours, 1 semester hour

RS813

Evidence Based Practice III

Interns compare different interventions based on patients seen by the intern, as approved by their clinician. Interns perform a literature search and report the clinical questions, search terms used; data based searched, papers found and their quality. The intern determines whether a given intervention has quality evidence supporting its use. Interns submit a report summarizing findings and discuss the case with other interns. Clinicians query interns not only regarding the findings, but also how the investigation provides practical application to the patient's care and management plan. Prerequisites: All Courses, Semesters I-VI, Corequisite: CS812

1 semester hour

RS824

Evidence Based Practice IV

Interns compare different interventions based on patients seen by the intern, as approved by their clinician. Interns perform a literature search and report the clinical questions, search terms used; data based searched, papers found and their quality. The intern determines whether a given intervention has quality evidence supporting its use. Interns submit a report summarizing findings and discuss the case with other interns. Clinicians query interns not only regarding the findings, but also how the investigation provides practical application to the patient's care and management plan. Prerequisite: All courses Semesters I-VII, Corequisite: CS823

1.5 semester hour

Computer Engineering

COMPUTER ENGINEERING 410

Introduction to Computer Architecture

Instruction set; data path and controller design for computers. Design and analysis of a RISC processor including integer and floating point pipeline design. Cache and virtual memory design, interrupts and DMA. Pre-requisite: Computer Engineering 312 or equivalent background.

3 lecture hours, 3 semester hours

COMPUTER ENGINEERING 415

Advanced Digital Systems

The objective of this graduate level course is to introduce the modern design methodologies for digital logic and automatic synthesis of digital systems. Students are provided with access to the CAD tools to use hardware description language to model, analyze and design various digital circuits/systems. It is expected that students will acquire a clear understanding of the main techniques, design strategies and the optimizations that are involved in modern digital circuit modeling, design and synthesis. The course projects will include the design and optimization of advanced critical digital systems used in bio-related applications.

3 Lecture hours, 3 semester hours

COMPUTER ENGINEERING 446 (CPEG 446/ELEG 446)

MEMS (Micro-Electro-Mechanical Systems)

Basic micro fabrication techniques, MEMS materials and their properties, MEMS device design and simulation, MEMS packaging and assembly, signal testing and MEMS reliability analysis. MEMS industrial applications in various areas will also be discussed. Students used ANSYS FEM software to design and simulate their behavior.

COMPUTER ENGINEERING 458 (CPEG 458/ELEG 458)

Analog VLSI

Modeling, design and analysis of analog VLSI circuits. CMOS processing and layout, current mirrors, Opamp, comparators, S/H voltage references, switched-capacitor circuits, data converters, filters and PLLs. Students design analog VLSI layouts, extract the netlists and simulate the circuit behavior. Transistors sizing will also be discussed. EDA tools PSPICE, Mentors Graphics are used.

COMPUTER ENGINEERING 460

Introduction to Robotics

Basic Robotics, including: position and velocity sensing, actuators, control theory, robot coordinate systems, robot kinematics, differential motions, path control, dynamics, and force control. Robot sensing, simulation of manipulators, automation, and robot programming languages are also investigated. Prerequisites: Computer Science 102, Electrical Engineering 360, Math 214 or 314 or permission of instructor.

3 lecture hours, 3 semester hours

COMPUTER ENGINEERING 472

Computer Networks

Introduction to fundamental concepts in the design and implementation of computer communication networks, their protocols, and applications. Topics to be covered include: over-

Computer Engineering

view of network architectures, applications (HTTP, FTP), network programming interfaces (e.g., sockets), transport (TCP, UDP), flow control, congestion control, IP, routing, IPv6, multicast, data link protocols, error detection/correction, multiple access, LAN, Ethernet, wireless networks, and network security. Prerequisite: Computer Engineering 471 or permission from instructor.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 473

Local Area Networks

Examination of wired and wireless Local and Metropolitan Area Network technologies, protocols, and the methods used for implementing LAN and MAN based enterprise intranets. The IEEE 802 media access control (MAC) protocols are examined. The 802.2 logical link control, 802.3/Ethernet, 802.3 token bus, and the 802.5 token ring protocols are analyzed, and the construction of LAN-based enterprise intranets is examined through a detailed analysis of bridging, routing, and switching techniques. High-speed LAN technologies are discussed through an examination of FDDI, Fast Ethernet, 100VG AnyLAN, ATM LAN and fibre Channel protocols along with the standards for Gigabit and 10 Gigabit Ethernet. The new and emerging wireless LAN and MAN standards are also examined. The 802.11 (WiFi) wireless LAN and 802.15 (Bluetooth) wireless PAN standards are discussed. Prerequisite: Computer Engineering 471.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 481

Mobile Communications

This course covers the basic technologies in the field of wireless and mobile communications. The following topics are covered in the course: wireless transmission, media access control, satellite systems, broadcast systems, wireless LANS, wireless ATM, network layer protocols, transport protocols and support for mobility. Pre-requisites: Computer Engineering 471 or Computer Engineering 472 or permission of instructor.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 482

Network Administration

Internetworking basis. Bridging and Switching Fundamentals. Routing basic. Network management fundamentals. Network architecture. Security. Troubleshooting. Pre-requisites: Computer Engineering 471 or Computer Engineering 473 and permission of instructor.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 489

Software Engineering

Structural development methodology for large software systems. Planning requirements, design, test, and validation. Advanced topics in software development. Prerequisite: Computer Science 102 and senior status.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 500

Graduate Co-op/Internship in Computer Engineering

By arrangement.

1-3 semester hours

COMPUTER ENGINEERING 510

Introduction to Computer Architecture

Instruction set; data path and controller design for computers. Design and analysis of a RISC processor including integer and floating point pipeline design. Cache and virtual memory design, interrupts and DMA. Prerequisite: Computer Engineering 312 or equivalent background.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 540

Image Processing

This is a project-oriented course. Students will learn and implement FFT with applications, image enhancement, image restoration, image compression, and image tomography. Projects will be conducted on workstations. Prerequisite: Electrical Engineering 443.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 548 (CEP 548/ELEG 548)

Low Power VLSI Circuit Design

With the rapid development of mobile computing, low power VLSI design has become a very important issue in the VLSI industry. A variety of low-power design methods are employed to reduce power dissipation of VLSI chips. This course is designed to cover low-power design methodologies at various design levels (from system level to transistor level). The basic low-power design strategies will be introduced in the class. Students will use the learned knowledge to design low-power VLSI circuits. Upon completion of this course, students will be able to analyze the power consumption of VLSI circuits, and design low-power VLSI circuits using various strategies at different design levels. The major target is to design VLSI chips used for battery-powered systems and high-performance circuits not exceeding power limits.

3 semester hours

COMPUTER ENGINEERING 550

Advanced VLSI Design

Implementation of custom VLSI designs, digital and analog simulation, fault tolerant design, de-

sign for testability. A major project will include the implementation of a digital integrated circuit. Prerequisites: Computer Engineering 448D.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 457

Electronic Design Using Programmable Analog Arrays

Use of design methodologies to implement analog circuits using programmable analog arrays. Introduction to design tools for circuit implementation. Laboratory experience includes design of analog filters, photoplethysmography, a non-invasive method of measuring blood pulsations, temperature measurements with PWM fan control, motor control using PID controllers, among others. Design tools include Matlab and design tools from Anadigm, Inc. (schematic capture and simulation)

COMPUTER ENGINEERING 561

Network Security

Conventional encryption and message confidentiality, public-key cryptography and message authentication. Authentication applications, electronic mail security, IP security, web security, firewalls, security in mobile network and other security systems. Prerequisites: Computer Engineering 471 or 473.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 570

Advanced Robotics

Advanced robotics and automation topics and techniques, including: active robotic sensing, intelligent and integrated manufacturing systems, robotic inspection, observation under uncertainty, multisensor feedback control of manipulators and mobile robots, advanced simulation and monitoring of robotic systems, high level modeling and control, and other topics. Prerequisites: Computer Science 460, Computer Engineering 460 or permission of instructor.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 584

Machine Perception

An introduction to sensing and machine vision. Vision algorithms that are usable in practical applications, sensing mechanisms and various types of sensed data representation, sense data processing and interpretation for different applications. Prerequisites: Computer Science 400, Computer Engineering 312 and Electrical Engineering 443.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 585

Computer Vision

A project-oriented course designed to familiarize the student with the computer image dis-

play, processing, and various limitations. The processing includes edge detection, Hough transform, thinning algorithms, moment invariant methods, relaxation algorithms, among others. Prerequisite: Computer Science 400, Computer Engineering 312, Electrical Engineering 443.

3 lecture hours; 3 semester hours

COMPUTER ENGINEERING 597 A

Master's Project

Lecture hours and topics to be arranged with Department Chair.

1 semester hour

COMPUTER ENGINEERING 597 B

Master's Project

Lecture hours and topics to be arranged with Department Chair.

2 semester hours

COMPUTER ENGINEERING 597 C

Master's Project (completion)

Lecture hours and topics to be arranged with Department Chair.

1 semester hour

COMPUTER ENGINEERING 598

Thesis in Computer Engineering

Lecture hours, semester hours and topics to be arranged with Department Chair.

3-6 semester hours

COMPUTER ENGINEERING 599

Independent Study in Computer Engineering

Independent study of advanced topics in Computer Engineering and submission of project report as required. Problem assignment to be arranged with and approved by the Department Chair.

3 semester hours

Computer Science

COMPUTER SCIENCE 400

OOP and Design Patterns

This course introduces the modern object oriented programming philosophy using C++ to the beginning graduate students. The emphasis is on developing the programming thought process in terms of objects and their interactions to each other. Concepts covered include data hiding, code reuse through inheritance, polymorphism, templates, exception handling, developing appropriate class hierarchy and code maintenance for large software projects. Prerequisites: Computer Science 102 or equivalent background.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 410

Java Programming

Object oriented programming, using Java, packages, interfaces, multi-threading, classes, inheritance, exceptions, interfaces, native methods, applets. Prerequisite: Computer Science 400.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 411

Advanced Object-Oriented Programming with JAVA

Covered topics include advanced features of Java, such as Database inter-connectivity (JDBC) with Servlets and JSP, remote method interface (RMI), distributed applications objects using CORBA and JNDI, Java Beans, introspection and reflection, Enterprise Java applications with EJB, interfacing Java to C++ with JNI, and additional advanced topics. A focus on developing components and packages. A major project is developed. Prerequisite: Computer Science 410.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 435

Unix System Programming

Introduction to shell programming and system in Unix/Linux environments. Various commands, tools, filters and specification languages are studied. System calls to deal with files, processes, pipes, three interprocess communication facilities (semaphores, shared memory, and message queue), and signals are introduced. Prerequisite: Computer Science 400.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 440

Windows Programming

This course covers Graphical User Interface (GUI), design and Windows programming using Visual C++ and Microsoft Foundation Class (MFC) library. Topics covered include windows architecture, message/event driven programming, designing Dialog based, SDI and MDI applications, Document/View architecture, Device Contexts, Database access using the MFC ODBC classes and ADO. A comprehensive project is assigned towards the end of the course, which covered important windows programming concepts. Prerequisite: Computer Science 400.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 460

Introduction to Robotics

Basic robotics including: position and velocity sensing, actuators, control theory, robot coordinate systems, robot kinematics, differential motions, path control, dynamics and force control. Robot sensing, simulation of manipulators, automation and robot programming, languages are also investigated. Prerequisite:

Computer Science 102, Math 214 or 314, or permission of instructor.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 485

Software Design Patterns

Introduce design patterns and software architectures. Combines pattern theory with examples to show why and when to use patterns and how to implement them. How to apply design patterns at the enterprise level. The use of design patterns to design and implement systems of high stability and quality. Compare and contrast patterns, including differences between Mediator and Façade. Discuss relationships between patterns. Study how patterns are collaborated within domains to solve complicated problems.

3 semester hour

COMPUTER SCIENCE 500

Graduate Co-op/Internship in Computer Science

By arrangement.

1-3 semester hours

COMPUTER SCIENCE 501

OOP and Design Patterns

This course introduces the modern object-oriented programming philosophy using C++ to the beginning graduate students. The emphasis is on developing the programming thought process in terms of objects and their interactions to each other. Concepts covered include data hiding, code reuse through inheritance, polymorphism, templates, exception handling, developing appropriate class hierarchy and code maintenance for large software projects. Prerequisite: Computer Science 102 or equivalent background.

3 Lecture hours, 3 semester hours

COMPUTER SCIENCE 502

Analysis of Algorithms

A course in advanced data structures and high-level algorithms. Varied uses of recursion. Graph representations and algorithms including traversals, path finding, closure, and spanning trees. Sorting files. Weighted and balanced trees; Hashing and collision handling. Complexity and analysis of algorithms. Prerequisite: Computer Science 102 or equivalent.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 503

Operating Systems

An advanced implementation oriented course in structure and design of operating systems. Scheduling and time management; processes and operating systems primitives; Deadlock handling techniques in operating systems; Space management and external device management.

Computer Science

Prerequisite: Computer Science 102, Computer Engineering 312, Knowledge of C/C++.
3 lecture hours; 3 semester hours

COMPUTER SCIENCE 504

Artificial Intelligence

Foundations of the theory of Artificial Intelligence. Game playing, pattern recognition, description of cognitive processes, heuristic decision procedures, general problem solvers. Learning and robotics. Discussion of the relationship with human thought process. Extensive Lisp programming. Pre-requisite: Computer Science 102 or permission of instructor.
3 lecture hours; 3 semester hours

COMPUTER SCIENCE 509

Automata Theory

Theory of automata and learning machines. Finite-state sequential machines and functions. Transition preserving functions, Generators and minimal generating sets. Input semigroup, Isomorphisms and Auto-morphisms. Prerequisite: Computer Science 227.
3 lecture hours; 3 semester hours

COMPUTER SCIENCE 520

Theory of Computation

Finite automata and Pushdown automata; Register machines; Recursive functions and sets; Languages, regular expressions; Context-free languages; Regular and context-free grammars; Pumping lemmas. Turing machines, Church-Turing thesis. Post-correspondence problem; Computability and complexity. Prerequisite: Computer Science 227 and knowledge of computer programming.
3 lecture hours; 3 semester hours

COMPUTER SCIENCE 545

Component Based Software Design

Modern component based software design approaches using both the Component Object Model (COM) as well as the CORBA technologies. In-depth look at the infrastructure of COM components presenting of concepts of class factories, interfaces (standard and custom), in-proc and local server components, IDL, type libraries, proxy/stubs and marshalling, automation and I Dispatch interface, structured storage and ActiveX controls. The distributed form of COM referred to as DCOM and its newest form is known as COM+, which integrates the transaction, and queuing capabilities are examined. A comparison of the CORBA technology is made by explaining its architecture and remoting capabilities. Prerequisite: Computer Science 440, Prerequisite by topic: 1. Good background in C++ programming, 2. Some knowledge of Windows Programming.
3 lecture hours; 3 semester hours

COMPUTER SCIENCE 550

Multimedia Database Systems

The issues in multimedia (audio, images and video), multimedia compression, multimedia operating systems, multimedia communications, multimedia indexing, querying and retrieving, and web database systems, which have been enormously developed recently, and are playing important roles in the areas of business, entertainment, medicine and education. The goal of this course is to give in-depth understandings to media themselves with emphases on other issues related to DBMS, operating systems and communications.
3 lecture hours; 3 semester hours

COMPUTER SCIENCE 551

Advanced Database

Advanced study of Relational databases including indexing structure, query optimization, rule and cost-based optimization, transactions and concurrency, recovery techniques, security, distributed database, data mining and other emerging database technologies. Prerequisite: Computer Science 450
3 lecture hours; 3 semester hours

COMPUTER SCIENCE 555

Web-Based Application Development

Introduction to fundamental issues in designing a web-based application. Review of the web technologies such as HTML, VBScript, JavaScript, DHTML, Java, XML and server-side technologies using Active Server Pages (ASP), CGI and Java Server Pages (JSP). Design issues include the creation of tiered and scalable applications by the use of COM+ components involving Microsoft Transaction Server and the Java approach of Enterprise Java Beans. Different projects are assigned to create dynamic, database-driven E-Commerce solutions involving, order tracking systems, inventory management, advertising management, creating score reports, personalizing the shopping experience and secure credit card transactions. Wireless E-Commerce applications and developing business-to-business application using XML, SOAP and Biztalk Servers. Prerequisite: Computer Science 400.
3 lecture hours; 3 semester hours

COMPUTER SCIENCE 560

Performance Evaluation and Analysis

This course covers the basic theory and practice of computer systems performance evaluation. The course focuses on three major aspects of performance analysis, measurement, simulation and analytical modeling using queuing theory. The topics will include measurement techniques, monitor tools, simulation models,

stochastic processes, queuing theory and analytical modeling techniques. Prerequisite: Background in computer architecture and probability and consent of the instructor.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 561

Network Security

Conventional Encryption and Message Confidentiality, Public-key Cryptography and Message Authentication. Authentication Applications, Electronic Mail Security, IP Security, Web Security, Firewalls, Security in Mobile Network and other Security Systems. Prerequisite: Computer Engineering 471 or 473.
3 lecture hours; 3 semester hours

COMPUTER SCIENCE 570

Advanced Robotics

Advanced robotics and automation topics and techniques, including: active robotic sensing, intelligent and integrated manufacturing systems, robotic inspection, observation under uncertainty, multisensor feedback control of manipulators and mobile robots, advanced simulation and monitoring of robotic systems, high level modeling and control, and other topics. Prerequisites: Introduction to Robotics (Computer Science 460 or Computer Engineering 460).

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 580

Introduction to Neural Networks

Introduction to neural computing, and fuzzy logic. Neural network models including feed forward, multilayered networks, back-propagation, fuzzy associative memories, self-organizing maps and adaptive resonance. Applications. Projects to implement networks designed for specific applications. Prerequisite: Proficiency in C or C++, calculus and matrix methods.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 584

Machine Perception

An introduction to sensing and machine vision. Vision algorithms that are usable in practical applications, sensing mechanisms and various types of sensed data representation, sense data processing and interpretation for different applications. Prerequisite: Computer Science 400, Computer Engineering 312.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 590

Parallel and Distributed Processing

Models of parallel computation including distributed, multiprocessor, multicomputer. Parallel programming constructs. The mutual

exclusion problem, synchronization and communication methods. Multi-computer topologies and topologies and topological embedding. Classes of parallel algorithms and design approaches. Performance analysis of parallel computation, including de-tailed and high level. A major project is required. Prerequisite: Computer Science 400.

3 lecture hours; 3 semester hours

COMPUTER SCIENCE 597 A

Master's Project

Lecture hours and topics to be arranged with Department Chair.

1 credit hour

COMPUTER SCIENCE 597 B

Master's Project

Lecture hours and topics to be arranged with Department Chair.

2 credit hours

COMPUTER SCIENCE 597 C

Master's Project (completion)

Lecture hours and topics to be arranged with Department Chair.

1 credit hour

COMPUTER SCIENCE 598

Thesis in Computer Science

Lecture hours, semester hours and topics to be arranged with Department Chair.

3-6 credit hours

COMPUTER SCIENCE 599

Independent Study in Computer Science

Independent study of advanced topics in Computer Science and submission of project report as required. Problem assignment to be arranged with and approved by the Department Chair.

3 credit hours

Computer Science & Engineering (Ph.D.)

These courses are open for students enrolled in the Ph.D. degree in Computer Science and Engineering.

COMPUTER SCIENCE & ENGINEERING 690

Independent Study

Course taken up by a student with a faculty member on a special topic that may not be broad enough to be offered as a regular course.

3 lecture hours, 3 semester hours

COMPUTER SCIENCE & ENGINEERING 692

Special Topics in Computer Science

Course offered to allow special topics courses

in the general area of Computer Science that do not fit into any of the available areas of specialization.

3 lecture hours, 3 semester hours

COMPUTER SCIENCE & ENGINEERING 693

Special Topics in Computer Engineering

Course offered to allow special topics courses in the general area of Computer Engineering that do not fit into any of the available areas of specialization.

3 lecture hours, 3 semester hours

COMPUTER SCIENCE & ENGINEERING 694

Written Comprehensive Examinations

Students taking comprehensive examinations are required to register for CSE 694.

0 lecture hours, 0 semester hours

COMPUTER SCIENCE & ENGINEERING 698

Teaching Requirement

Ph.D. students assigned teaching courses to fulfill the teaching practicum of the Ph.D. in Computer Science and Engineering are required to register CSE 698.

0 lecture hours, 3 semester hours

COMPUTER SCIENCE & ENGINEERING 699

Seminar (Oral Exam)

Seminar is a zero credit course. It involves attending the regular departmental seminars and presenting one's work in one of the seminars.

0 lecture hours, 0 semester hours

COMPUTER SCIENCE & ENGINEERING 710

Ph.D. Dissertation

The student is expected to work on the accepted topic and come up with original results. S/he has to report the results in the form of a Ph.D. dissertation. The student is encouraged to document the intermediate results in the form of technical reports. S/he is also encouraged to publish these results as they are discovered, in the international professional literature, i.e., refereed conference proceedings and journals. Proof of good work is the acceptance of the results by reputed journals. Intermediate results can also be discussed in departmental seminars. The completed dissertation must be distributed to the dissertation committee members at least two weeks before the dissertation defense. The committee will read it and certify that the dissertation is a work of substantial merit and that it can be defended. It is the responsibility of the student that the final draft of the dissertation addresses all legitimate concerns of the committee members.

Varies from 1-12 semester hours

Counseling

COUNSELING 502

Orientation to Mental Health Counseling

This course will provide an orientation to the program and the counseling profession with a primary focus on the culmination to professional licensure. This includes an overview of the profession, touching on its history, counselor roles, and relationships with other human service providers. The course will discuss the relevant content for comprehensive examinations and the requirements for professional credentialing such as NBCC certification and licensure as a Professional Counselor. Additionally, the course will provide an introduction to the University library along with resources for on-going professional development and self-care. Offered in the fall and spring semesters

1 Semester hour

COUNSELING 503

Orientation in Student Affairs

The course provides an overview of Master of Science in Counseling, specifically the College Student Personnel Concentration. The course reviews competencies and expectations of the profession, professional research and writing, as well as the principles of sound practice in Student Affairs. Offered annually

1 semester hour

COUNSELING 505

Helping Relationships

This course provides a definitive view of counseling including the characteristics of the counselor and the elements of the counseling process. Through experiential exercises and videotaped simulated counseling the student will attain skills such as attending, empathic listening, assessing and focusing on important client concerns, structuring the process, and facilitating change. Offered in the fall and spring semesters

3-4 semester hours

COUNSELING 512

Counseling Theories

This course surveys the major theories and perspectives of counseling including the Psychoanalytic, Behavioral, Humanistic-Existential, Cognitive, Constructivist-Post Modern, and Systems approaches along with an integrated, eclectic or confluent perspective. Students gain an understanding of the role of theory, the philosophical basis of the theories, the divergent methods utilized, and the utility of each perspective. Offered in the fall and spring semesters

3 semester hours

Counseling

COUNSELING 515

Clinical Skills Mental Health Counseling

The focus of this course is the skills necessary to work in a psychotherapeutic venue including treatment planning, report writing and diagnosis. The course covers description and diagnosis of the mental disorders as prescribed by the Diagnostic and Statistical Manual. Offered annually

3 semester hours

COUNSELING 520

Introduction to Student Affairs

This course provides an overview of the purpose and functions of student affairs, including the role of the Student Affairs Professional on a college campus. Through the study of theoretical perspectives and empirical data, you learn to describe different elements and types of educational environments and understand their effect on different types of students. Students will understand and apply theories/environment interaction in a collegiate setting. Offered annually

3 semester hours

Equivalent to COUN-681

COUNSELING 527

Student Affairs Administration

This course is an introduction to the administration of higher education institutions in the United States. Course material includes an overview of history, purposes, formal structure, governance, finances, and administrative behavior. Offered annually

3 semester hours

COUNSELING 530

Family Counseling

This course examines the history of family counseling, the stages of family development, philosophical basis and major theoretical approaches to family counseling. Ethical issues and guidelines specific to family counseling in alignment with Ethical Standards of the American Counseling Association and the American Association for Marriage and Family Therapy will be discussed. Offered annually

3 semester hours

COUNSELING 532

History and Systems of Human Services

This course is an overview of human service history and current issues, social policy analysis. Skills related to advocacy and the change agent, and principles of case management. Offered bi-annually

3 semester hours

COUNSELING 535

Principles of Applied Research

This course provides a grounding in the methodology of social science research as it pertains to the human service field. It addresses the following four content areas: 1) The nature of social science research; 2) Critical analysis of social science research; 3) Simple descriptive and inferential statistics; and 4) Action research design. Offered annually

3 semester hours

Equivalent to COUN-500.

COUNSELING 536

Assessment in Student Affairs

This course is designed to provide an introduction to assessment in student affairs and higher learning education. Students will explore a variety of assessment methods and techniques and apply their learning through case studies and/or real world assessment. Students will learn the purpose of, and interact with, University's Institutional Review Board. Offered annually

3 semester hours

COUNSELING 540

Group Process: Appl/Theory

The course focuses on the dynamics of leadership and various membership roles. Alternative theoretical models of groups will be studied. An experiential group experience is required. Counseling 505 and 508 are prerequisites. COUN 541 is geared specifically to the needs of Human Resource professionals. Offered annually

4 semester hours

Equivalent to COUN-521.

COUNSELING 545

Social and Cultural Foundation

This course examines how social and cultural factors impact on the individual and subsequently how the counselor attends to and addresses the different social forces and cultural differences in the counseling venue. Offered annually

3 semester hours

Equivalent to COUN-516

COUNSELING 552

Human Development: A Lifespan

This course provides a survey of major theories and issues in the field of human development. Topics include the nature of human development; research methods in the field of human development; biological bases for human development; the social, emotional and cognitive changes that occur across the lifespan; and how human development affects, and is affected by, family life, peer relationships, schooling, gender, values, and culture. Offered annually

Offered annually

3 semester hours

Equivalent to COUN-560

COUNSELING 555

Student Development Theory

This course is designed for graduate students in College Student Personnel. Course participants will conceptualize how college students grow and develop during the critical college years, become familiar with the major families of theories for understanding college student development and the concerns of students who are members of campus subculture, and be able to apply developmental theories in practical settings in higher education to assess problems encountered by college students and to design educational interventions. Offered annually

3 semester hours

Equivalent to Coun621

COUNSELING 562

Today's College Student

This course will examine the diverse demographics of students of American colleges and universities, including international college students and discuss management of this culture. Students will research the literature on how college impacts students who attend as well as current trends and topics in higher education. Offered annually

3 semester hours

COUNSELING 568

The Counselor as Professional

This course serves as an orientation to the helping profession by addressing issues that impact on the provision of services such as ethics, law, certification, and professional role expectations. Completion of this course must precede internship. Offered annually

3 semester hours

Equivalent to COUN-510

COUNSELING 570

Strategies/Techniques of Counseling

Building on basic listening skills this course focuses on developing strategies and interventions that promote therapeutic movement for the client. Techniques of the various theoretical orientations will be presented and practiced. Simulated role plays and videotaped sessions provide active opportunities to develop the skills. This course has significant out of class expectations. Prerequisites include completion of at least 9 credits and Counseling 505 and 512. Offered annually

4 semester hours

Equivalent to COUN-524.

Counseling

COUNSELING 575

Practicum

This course provides students an opportunity for supervised work experiences in a supervised work setting. Students participate in an exploratory field experience in selected community, agency, collegiate, or corporate settings. Departmental permission is required. Specific coursework may also be required depending upon concentration or setting. Offered each semester

2 semester hours

COUNSELING 582

Appraisal Procedures for Counseling

In this course students become familiar with a variety of standardized assessment instruments, learn how to evaluate them, select several tests that are appropriate for use in an area of professional responsibility related to a real or anticipated counseling situation, and interpret test results in a supervised setting. Prerequisites include Counseling 505 & 512 Offered annually

3 semester hours

Equivalent to COUN-525.

COUNSELING 585

Trauma & Crisis Intervention

This course serves as an introduction to the counselor of the implications of the psychological trauma. Prevalence and impact will be explored as well as various treatment approaches. Minimum prerequisites: Counseling 505 and Counseling 512. Practicum Level, Post-Graduate or current Employment in the counseling field preferred. Offered annually

3 Semester hours

COUNSELING 587

Psychopharmacology

This course is designed to give community counselors a working knowledge of current trends in Psychopharmacology for children and adults. The increased use of medications to treat mental health disorders in our society has led to a need for mental health workers to understand the types of medications currently used, the effects of specific treatments, and the overall impact on educational, social & personal development. Offered annually

3 semester hours

Equivalent to COUN-561.

COUNSELING 590

Master's Project

This course is designed to assist the student in development of a scholarly masters project, which is the final product required for completion of the Master's Degree in Counseling. Offered each semester

1-3 semester hours

COUNSELING 595

Addictions and Treatment

This course is designed to provide a practical experience for counselors learning to work with alcohol and other drug abusers and other addictions. Covered in the course will be a survey of the various psychoactive drugs and behavioral addictions along with diagnosis and treatment modalities in working with persons with addictions, and those affected by persons with addictions. Prerequisites include Counseling: 505, 512 and 540. Offered annually

3 semester hours

COUNSELING 600

Cmhc Internship 1

The goal of the internship is to further develop and refine the skills established during practicum. You are eligible for the internship component of your program after completing the required coursework and approval from faculty. The internship is the heart of the master's degree training program in Counseling at the University of Bridgeport (UB). It provides a venue within which students receive the guidance necessary for development as an entry-level counselor. Program faculties provide didactic and experiential training, which serves as the foundation for the development of skills necessary for independent work in clinical settings. Fee Assessed Permission of Instructor/ Internship Coordinator Required Offered in the fall and spring semesters

1-4 semester hours

COUNSELING 601

Internship 1 College Stud Pers

The goal of the internship is to further develop and refine the skills established during practicum. You are eligible for the internship component of your program after completing the required coursework and approval from faculty. The internship is the heart of the master's degree training program in Counseling at the University of Bridgeport (UB). It provides a venue within which students receive the guidance necessary for development as an entry-level counselor. Program faculties provide didactic and experiential training, which serves as the foundation for the development of skills necessary for independent work in clinical settings. Fee Assessed Permission of Instructor/ Internship Coordinator Required Offered in the fall and spring semesters

1-3 semester hours

COUNSELING 602

Internship 1 – Human Services

The goal of the internship is to further develop and refine the skills established during practi-

cum. You are eligible for the internship component of your program after completing the required coursework and approval from faculty. The internship is the heart of the master's degree training program in Counseling at the University of Bridgeport (UB). It provides a venue within which students receive the guidance necessary for development as an entry-level counselor. Program faculties provide didactic and experiential training, which serves as the foundation for the development of skills necessary for independent work in clinical settings. Fee Assessed Permission of Instructor/ Internship Coordinator Required Offered in the fall and spring semesters

1-3 semester hours

COUNSELING 605

Clinical Mental Health Counseling Internship 2

Program faculties provide didactic and experiential training, which serves as the foundation for the development of skills necessary for independent work in clinical settings. This reflects on the second part of the internship experience and can only be taken after successful completion of Coun600. Offered in the fall and spring semesters

4 semester hours Permission of Instructor/ Internship Coordinator Required

COUNSELING 606

College Student Personnel- Internship 2

Program faculties provide didactic and experiential training, which serves as the foundation for the development of skills necessary for independent work in clinical settings. This reflects on the second part of your internship experience and can only be taken after successful completion of Coun601. Offered in the fall and spring semesters

3 semester hours Permission of Instructor/ Internship Coordinator Required

COUNSELING 607

Human Services- Internship 2

Program faculties provide didactic and experiential training, which serves as the foundation for the development of skills necessary for independent work in clinical settings. This reflects on the second part of your experience and can only be taken after successful completion of Coun602.

3 semester hours Permission of Instructor/ Internship Coordinator Required

COUNSELING 610

Career & Lifestyle Development

This course provides an introduction to a lifespan approach to career and lifestyle development. Theories, research, and counseling strategies related to career and lifestyle issues are

Counseling • Dental Hygiene

explored. Labor resources and information, career assessment tools, computer assisted career guidance, life roles, cultural considerations, and placement procedures are reviewed as interrelated factors to the study of career development. Counseling 505 and 512 are prerequisites. Fee Assessed. Offered annually
3 semester hours

COUNSELING 615

Ethical/Legal Issues Higher Ed (3.00 Cr.)

This course is designed to provide entry-level student affairs practitioners a basic understanding of the legal issues prevalent on college campuses. Students will study case law and apply their knowledge through case studies. Offered annually

3 semester hours

COUNSELING 620

Leadership in Contemporary Workforce

This course guides you to understand the leadership principles and practices of employee relations in today's workplace. The emphasis will be on understanding the interpersonal and leadership skills and practices needed to succeed in today's workplace, including the importance of workplace ethics, cultural diversity, managing today's work/life balance issues, and learning about the role communications plays in organizations, including the issues surrounding technology in the workplace. Offered bi-annually

3 semester hours

COUNSELING 622

Group Work Processes and Skills

A laboratory and seminar course in which students become actively involved in working with small groups. Emphasis in the supervised group and seminar sessions will be on the leader's role as a facilitator of individual growth within the group setting. Prerequisite: Counseling 505 & 512 or departmental permission. Offered bi-annually

3 semester hours

COUNSELING 625

Org & Admin Mental Health Systems

This course provides a comprehensive introduction to human service organizations through the perspective of managerial competencies necessary for success in the human services agencies, including human resources, supervision, managing finances, monitoring and evaluating programs and services, social advocacy and managing change. Prerequisites include Counseling 505, 512, and 540. Offered bi-annually

3 semester hours

COUNSELING 630

CSP CUMULATIVE EXAM

This is the culminating exam for students in the college student personnel concentration. Students will take this exam in their last semester of study. Students must pass the exam in order to graduate. See your advisor to register for the exam. Offered annually

1 semester hours

COUNSELING 682

Cognitive Behavioral Therapy

The course is designed to teach students the basics of how to conduct Cognitive Behavior Therapy (CBT). Lectures will stress theory and case conceptualization. Exercises will address both theory and application. This course provides a more sophisticated, in-depth look at CBT as it pertains to cases. Students will read two texts and case and biographical material. They will also participate in in-class exercises that will include operationalizing the problem, case conceptualization, treatment planning, practicing specific techniques (in the roles of therapist and client), and considering special issues for certain populations. Offered annually

3 semester hours

Dental Hygiene

DENTAL HYGIENE 500

Leadership in Dental Hygiene

This course focuses on the theories, concepts, and principles of leadership skills related to personal behavior, communication, organizational and leadership styles. This course explores the opportunity to develop leadership roles appropriate to the dental hygiene profession.

3 lecture hours, 3 semester credits

DENTAL HYGIENE 501

Grant and Contract Writing

This course will provide the graduate students with an introduction to the process of grant application, award, post award management, types of grants and contracts, content and language of announcements for funding, and requirements of various funding agencies. The steps to writing a grant proposal for healthcare funding from private, state, and federal funding sources will be covered.

DENTAL HYGIENE 502

Evidence Based Research

This course is designed to prepare the student to utilize research as the foundation for clinical decision making. The practical application of evidence-based decision making to the clinical management of individual patients is explored.

DENTAL HYGIENE 503

Clinical and Didactic Educational Concepts

This course will introduce the graduate student to a procedure for developing a competency-based curriculum. The student will learn the steps in developing a lecture, module of instruction, and a course. Cognitive, affective, and psychomotor learning theories are addressed along with clinical teaching methodologies.

3 lecture hours, 3 semester credits

DENTAL HYGIENE 504

Clinical/Laboratory Teaching

This course will provide students with the practical knowledge and skills to function as a competent clinical/laboratory instructor. Psychomotor skill development and analysis, remediation of performance concerns, evaluation, and faculty calibration are areas stressed.

1 lecture hour, 4 clinic/laboratory hours, 3 semester credits

DENTAL HYGIENE 505

Didactic Student Teaching

This course will provide students with the practical knowledge and skills to function as a competent didactic instructor. Cognitive skill development and analysis, evaluation strategies, and faculty calibration are areas stressed.

1 lecture hour, 4 laboratory hours, 3 semester credits

DENTAL HYGIENE 507

Dental Health Services Administration/Management

This course is designed to familiarize the student with the administrative concepts necessary to effectively administer dental health facilities and departments. Emphasis is placed on leadership, decision making and problem solving skills. It examines political, social, and legal systems that affect dental hygiene administration and influence its role.

3 lecture hours, 3 semester credits

DENTAL HYGIENE 508

Curriculum Development and Management

This course provides the student with the study and development of models for dental hygiene curriculum design and implementation. The development and utilization of competencies and the evidence based instruction is emphasized.

3 lecture hours, 3 semester credits

DENTAL HYGIENE 509

Dental Public Health

This course is designed to prepare students for leadership roles in dental public health settings. Administration, grant writing, consumer advocacy, epidemiology, biostatistics, the assessment, planning, implementation, and evaluation stages of programs and alternative

Dental Hygiene • Design Management

dental hygiene care is emphasized.

DENTAL HYGIENE 510

Foundations of Healthcare Management

The focus of this course is the healthcare system in the U. S., specifically how its entities work, how they interrelate and how it differs from healthcare systems in other countries with more government controlled systems.

DENTAL HYGIENE 511

Epidemiology

This course will provide the graduate student with the skills necessary to study health states in populations and its applications in basic science, general clinical research, and public health. Students will critique the dental hygiene literature as it applies to the subject of epidemiology.

DENTAL HYGIENE 513

SEMINAR IN PUBLIC HEALTH ISSUES

This course will explore current concepts and challenges facing dental healthcare delivery through the development of collaborations across healthcare disciplines, delivering culturally and linguistically competent healthcare, and evaluating current and proposed dental healthcare workforce models. Initiatives serving the purpose of guiding national health promotion and disease prevention to improve the dental health of the U.S. Population and informing the American public on health matters will be examined.

DENTAL HYGIENE 516

Concentrated Practicum

This course provides the Graduate student with the opportunity to take an active role in the development of a practical experience at a site relevant to their specialized area of concentration. The student identifies a site and mentor to supervise the practicum prior to the start of the course. The practicum faculty advisor works closely with the student throughout the course providing strategies to help the student achieve a successful outcome.

1 lecture hour; 6 laboratory/clinic hours, 3 semester credits

DENTAL HYGIENE 520

Master's Thesis Preparation

Original research in a chosen topic relating to the graduate student's area of specialization will be studied, conducted, written and presented.

1 lecture hour; 8 laboratory/clinic hours, 4 semester credits

DENTAL HYGIENE 521

Master's Thesis Extension

1 credit

Design Management

DESIGN MANAGEMENT 400

Collaborative Design Studio I

Design Management is an inter-disciplinary field that combines various forms of design including graphic design and branding, interior design and architecture, industrial design, and fashion and textile design. Collaborative Design Studio I will begin to equip students with the skills they need to work with cross-functional teams. This is done through client-based design projects that originate from local Fortune 500 and other global organizations. Students will learn communication, team building, and leadership skills as they hone their design talents.

2 semester credits

DESIGN MANAGEMENT 401

Collaborative Design Studio II

Building on the foundation formed in Collaborative Design Studio I, students will again be grouped in inter-disciplinary teams to complete an innovative, client-based design project. The projects for this course will focus the students' attention on the triple bottom line: profitability, sustainability, and responsibility.

2 semester credits

DESIGN MANAGEMENT 500

Collaborative Design Studio III

Collaborative Design Studio III will continue to equip students with the skills they need to work with cross-functional teams on real world, client-based assignments. Students will learn communication, team building, and leadership skills as they hone their design talents.

2 semester credits

DESIGN MANAGEMENT 501

Collaborative Design Studio IV

Collaborative Design Studio IV will continue to equip students with the skills they need to work with cross-functional teams on real world, client-based assignments. Leadership skills will be given extra attention during the second year's teamwork.

2 semester credits

DESIGN MANAGEMENT 410

Design Management I

Design Management is a multifaceted, organic discipline whose exact definition can differ between organizations and Design Managers. In Design Management I, students will explore various definitions of Design Management with the goal of defining their own course of study. By reading and writing about relevant case studies, students will examine a wide variety of applications of design management. Students will be required to present their description of

design management by the end of the term.

3 semester credits

DESIGN MANAGEMENT 411

Design Management II

As the student's concept of design management deepens, they will begin to explore the implications that design management has on an organization. Design Management II will describe the six core principles of the program: Marketing, Leadership, Finance, Legal, Operations, and Strategy, as well as the triple bottom line: Profitability, Responsibility, and Sustainability. Students will learn the ripple effect their design decisions have on an organization as they broaden their understanding of the field of design management.

3 semester credits

DESIGN MANAGEMENT 510

Design Management III

Students will continue to further their understanding of design management. Through relevant case studies, text readings, and lectures, students will develop a plan for the application of design management principles within their organization. The final project for this class includes an action plan for an organization where design management principles will make a meaningful impact on their triple bottom line.

3 semester credits

DESIGN MANAGEMENT 511

Design Management/Thesis IV

Design Management/Thesis IV requires students to develop an idea that embraces and explores a particular aspect of design management. Students will work independently on a paper that broadens the design management field. This unique challenge demands that the students demonstrate an understanding of the six core principles of the program: Marketing, Leadership, Finance, Legal, Operations, and Strategy, while injecting their own interpretation of design management based on their experience, talent, and culture.

3 semester credits

DESIGN MANAGEMENT 598

Internship/Co-op

Fairfield County and the surrounding tri-state area are rich in organizations in need of qualified design management interns. Through strategic partnerships and student initiative, internships will be established to give students first-hand experience as a design manager. Students will report on their experience and that report, coupled with his or her manager's evaluation, will form the basis for determining the student's grade. Internships are taken by domestic students; Co-ops are taken by inter-

Design Management • East Asian and Pacific Rim Studies

national students.

1-3 semester credit. 1 credit, repeatable for two semesters. A third semester is permitted with approval of the program chair.

Maximum DSNMG 598 credits is 3

DESIGN MANAGEMENT 599

Special Projects

Special projects and independent study give students the opportunity to explore specifics of design management as they relate to their own area of expertise. Students will be encouraged to seek out opportunities to gain practical experience in the design and design management fields. This course should include field, library, and institutional research on a specific aspect of design management. Student evaluation will be based on a report submitted by the student.

2 semester credits

MARKETING 400

Marketing

This course explores the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual, organizational, and societal objectives. The underpinnings of marketing discipline will be taught through text, case studies, articles, and class discussion. Mastery of these principles will come through individual and group assignments to create marketing solutions for real-world products.

3 semester credits

MANAGEMENT 400

Leadership & Management

This course will introduce students to the primary tenets of leadership and management. Successful organizations foster innovation and efficiency. Students will evaluate the dynamics related to realizing organizational progress through the effective and efficient use of talent, structure, culture, methods, and technology. In addition to the required textbooks, students will research industry journals as a way to evaluate the application of leadership and management techniques in real settings across various industries.

3 semester credits

ACCOUNTING 400

Financial Accounting

This course will provide managers with the skills necessary to read, interpret, and apply information about an organization's financial position. Managerial accounting and finance concepts will precede financial statement analysis. Topics covered include: how accounting data is generated in business operations, how financial

statements are created, management of finance to maximize return on investment, and stakeholder equity. Students will participate in case work applying the principles presented in class.

3 semester credits

BUSINESS LAW 400

Legal Environment of Business & Ethics

This course focuses on how the legal environment of business impacts business decisions with broad ethical, international, and critical thinking examples throughout. Knowledge of the legal aspects of running a business will enable the student to conduct business within the legal framework and understand the ethical dimension of business decisions. Topics include: Introduction to Business Ethics and the Judicial and Legislative Process; Litigation, Alternative Dispute Resolution, and the Administrative Process; Business Crimes, Torts, and Contracts; The Constitution and Government Regulation of Business; Business Organizations; Employment and Labor Laws; Consumer Protection and Environmental Regulation; and International Law and Ethical Conflicts.

3 semester credits

INFORMATION SYSTEMS
AND KNOWLEDGE MANAGEMENT 400

Information Systems & Technology

Information technology has become a key component for accomplishing strategic and operational goals in organizations today. As such, organizations expect their new employees to have a basic understanding of information technologies. To accomplish organizational goals and advance one's career path, one needs to understand and apply information technologies effectively, efficiently, and creatively. The purpose of this course is to provide an introduction to information systems and technology and to familiarize students with the fundamental concepts and principles of information systems. The course is targeted for graduate students who have little or no background in information systems. Therefore, it focuses on breadth of coverage rather than depth in any specific area.

3 semester credits

MANAGEMENT 582

Small Business & Entrepreneurship

A comprehensive review of the marketing, operational, financial, product, service, and business strategy and plans that must be mastered and developed as foundation for start-up of a small business or entrepreneurial enterprise. In addition, growth of existing business through intrapreneurship is also covered. Students will develop a comprehensive business plan for a business of their choice which is acceptable to

the professor.

3 semester credits

DESIGN MANAGEMENT 580

New Product Commercialization

The objectives of this course are to understand and apply concepts and techniques of product commercialization. The course focuses on taking student-created product concepts and having student teams drive the concepts to become actual products. Product design, prototype creation, market analysis, and financial analysis all come together with the student team to create a viable product. If ideas are worthy, teams may work with the University's CTech IncUBator to actually commercialize their products. Students are strongly encouraged to find a sponsor to actually commercialize their product ideas.

3 semester credits

East Asian and Pacific Rim Studies

GLDP/EAST ASIAN AND PACIFIC RIM STUDIES 401/501

Graduate Seminar in Research Methods

This is an introductory course in qualitative and quantitative research methods. It is designed to introduce you to basic concepts and issues (statistical, analytical, and ethical) encountered in research investigation. We will discuss what research is, the tools of research, research design, and writing the research report. Included will be an introduction to a diversity of research methods, including survey, historical research, experimental methods, content analysis, and so forth. An overview of statistical means of data interpretation also will be presented, including correlation, t-tests, ANOVA, Chi-Square Test, Sign Test, regression analysis, and so forth.

3 semester hours

EAST ASIAN AND PACIFIC RIM STUDIES 500

Graduate Co-op/Internship in East Asian and Pacific Rim Studies

Students may complete a curricular practical training that reflects the competencies that the students has developed in the East Asian and Pacific Rim Studies program. Students need to have their supervisor in the training certify satisfactory task performance and students must submit a written evaluation of their experience.

1-3 semester hours

GLDP/EAST ASIAN AND PACIFIC RIM STUDIES 511

Issues in Economic Development

This course explores current issues in economic development including poverty and poverty alleviation, strategies to overcome poverty and underdevelopment including microfinance, the roles of multilateral financial institutions, glo-

East Asian and Pacific Rim Studies

balization, and the Washington Consensus. The course will also explore the roles of regional arrangements and development institutions in attempts to overcome underdevelopment. The theoretical underpinning of the course lies in the many schools of thought that have produced explanations of the causes and consequences of development and underdevelopment. The course attempts to plot strategies to achieve goals of economic development.

3 semester hours

GLDP/EAST ASIAN AND PACIFIC RIM STUDIES 522

Conflict Analysis and Resolution

This course examines theories about and sources of conflict (resource allocation and shortage; ideological, religious, and cultural disagreement; power distribution; perceptions of security; etc) to set the stage for conflict analysis and negotiation. In conflict analysis, the impact of cultural-linguistic systems on agreements and disagreements is examined. Culturally sensitive strategies of negotiation, conflict resolution, and mediation also are examined and practiced.

3 semester hours

EAST ASIAN AND PACIFIC RIM STUDIES 530

Pacific Rim Culture and Development

Outcomes 1 (B) and 2 (I)

This course introduces students to the challenges of socioeconomic and political development in the Pacific Rim with its sharply differing approaches to development, due to factors such as traditions which have existed in some cases for millennia and are also influenced sharply by histories of Eastern and Western colonialism and cross-cultural differences. The course introduces students to the modern models of developments which have been employed by the United States, Australia, China, Singapore, Chile, Japan, Taiwan, and Korea and will consider the lessons learned from these processes. The course will also explore the major religious and cultural trends as well as some of the historical developments that have contributed to recent East Asian economic successes.

3 semester hours

EAST ASIAN AND PACIFIC RIM STUDIES 542

Challenges in Asia Pacific Political and Economic Integration

The course will consider the unique challenges that have slowed efforts to create an East Asian and eventually an Asia Pacific Economic Community. Students will dedicate special attention to the creation and development of the Asia Pacific Economic Cooperation and to the issue of political and economic hegemony and the ongoing disputes related to territorial dis-

putes and interpretations of history. Students will also be introduced to the legal instruments and treaties that facilitated European integration as a possible measure or eventual standard of successful integration.

3 semester hours

EAST ASIAN AND PACIFIC RIM STUDIES 525

Models of Good Governance in the Asia-Pacific

This course examines the philosophical and the political underpinnings of good governance of the Asia-Pacific region. This course will taken into account the two major reference points for political philosophy in the region- Western Political Philosophy and East Asian political philosophy with special attention being given to Confucianism. Students will also consider the role of Islam and its political implications with particular attention being paid to Indonesia, Malaysia and the Moros regions of the Philippines. The course will also note the unique process of transition from authoritarian to democratic rule in Japan, Korea, Taiwan, and in the Peoples Republic of China.

3 semester hours

EAST ASIAN AND PACIFIC RIM STUDIES 563

Business and Diplomacy—East Asia vs. the West

This course will consider the differing approaches to business and diplomacy of East Asia and the West. It will consider the ways in which the two approaches differ from each other, considering elements such as “face,” direct versus indirect approaches, and the primacy of relationship versus the primacy of legal contracts. The course will be conducted based on a series of case studies and simulations where students will be asked to plan and participate in intercultural negotiations and planning.

3 Semester Hours

GLDP/EAST ASIAN AND PACIFIC RIM STUDIES 536

Political Communication and Governance

This course focuses on the relationship between media and politics and media and governance. It will also examine the issues of freedom of speech and freedom of the press, media as mouthpiece or watchdog. The course will also study how media are used in governance, how public opinion is formed, shaped, and influenced, and how political and public agenda are set.

3 semester hours

GLDP/EAST ASIAN AND PACIFIC RIM STUDIES 543

Communication and National Development

The focus of this course is on communication and national development and nation-building. Students will learn how media, communication, and information can be used to improve economic, political, and cultural con-

ditions of people around the world. In particular, the course will look into the functions media communication and social marketing demonstrate in reducing poverty, combating hunger, improving literacy, promoting public health care, fighting corruption, and protecting the environment among others.

3 semester hours

GLDP/EAST ASIAN AND PACIFIC RIM STUDIES 581

Advanced Diplomacy

This course will build upon the skills and competencies that the student has acquired in foundational courses in the Global Development and Peace program including GLDP 522 International Conflict Negotiation as well as other foundational courses in the GLDP program in order to allow students to develop enhanced understanding and competency in the areas of diplomacy and negotiation. The course will explore the components of diplomacy, with a special focus on negotiation. It will also include settlement on issues to be negotiated, organization of negotiation agendas, the role of spokespersons, problem solving, public diplomacy; and the roles of Track I, Track One and a Half, Track II and Track III diplomacy in addressing issues.

3 semester hours

GLDP/EAST ASIAN AND PACIFIC RIM STUDIES 591

Internship

The Graduate Internship is completed once the student has completed at 21 credits in the GLDP program. It serves as the venue in which students can accomplish two important outcomes, i.e., they can apply the foreign language that they have been studying in an overseas setting (international GLDP students may do their internship in the US if they already speak a second world language in their home country rather than English) and they can intern in an agency or organization where the skills that they have acquired in the GLDP academic program can be put into practice.

3 semester hours

EAST ASIAN AND PACIFIC RIM STUDIES 598

Tutorial

The tutorial is offered at the completion of the internship of students in the Master of Arts in Global Development and Peace. The Tutorial is designed to allow students to reflect on and present on the the internship experience. The tutorial invites students to reflect on the internship experience based on the student's experiences prior to and during the tutorial as well as a broader reflection on the mission of and lessons learned from the organization where the student has interned. The tutorial also prepares students for the program's comprehen-

sive exam that includes both an oral and a written component. As a part of the tutorial students also assemble a portfolio of all of the significant work that they have completed during the program and a written reflection on that work. Much of the work of the tutorial is done independently of the classroom experience. Students are welcome to meet with the instructor as they progress in preparations and they are strongly encouraged to do so. (Prerequisites: Student must have completed 24 credits in the program including the internship). *3 semester hours*

EAST ASIAN AND PACIFIC RIM STUDIES 599

Thesis

The thesis represents the culmination of the MA in East Asian and Pacific Rim Studies demonstrates competency in the major as well as the track in which the student has chosen to specialize. The Thesis requires identifying a theme or topic selected by the student in consultation with the thesis adviser and this is followed by detailed research on the topic and the analysis of findings in the form of substantial written work. This is normally done within the confines of the student's final semester of study in the program.

3 semester hours

Economics

ECONOMICS 400

Economics

This is a course for managers in both micro and macro economics. Topics addressed will include the prevailing patterns of economic institutions, national income analysis, international trade, prices and production; economic development, market structure and consumer decision analysis, competition, monopoly and monetary policy issues. Prerequisites: Admission to graduate study.

3 semester credits

ECONOMICS 500

Economics & Finance

This course is a graduate introduction to the study of economics and finance, two interrelated and integral fields in the study of business. This course develops the foundation in understanding how the real economy works, and how finance connects the real economy to the monetary system via the financial system. The course starts by discussing how the market system works, including basic macroeconomic concepts relevant to the study of finance. Subsequently, the course delves into how capital budgeting decisions made by

firms are essential to achieve macroeconomic goals. Topics include financial statements, time value of money, the financial markets, and how firms make capital budgeting decisions. In addition to textbook readings, students will use current events to complete.

3 semester credits

Education

Note: Teacher Leadership courses are designated with the prefix of EDMM. Specific titles are listed with the programs of study in the chapter for graduate studies in the School of Education. Consult the division faculty for detailed course descriptions.

EDUCATION 348 C, M

Directed Observation and Supervised Teaching in the Elementary or Middle School

This is a full-time field experience in a selected elementary or middle school. This meets requirements of Connecticut's TEAM program. Department permission is required.

6 semester hours

EDUCATION 392

Directed Observation and Supervised Teaching in Secondary Schools

This is a field experience in selected secondary schools. This meets requirements of Connecticut's TEAM program. Departmental permission is required. Department permission is required.

6 semester hours

EDUCATION 440

Methods and Materials in Teaching Language Arts

This course focuses on the teaching and learning of the English language arts with an emphasis on instructional planning and assessment using current state and national standards.

ED 440C concentrates on the language arts processes and practices implemented in the elementary-level curriculum, grades K-6.

2 semester hours

ED 440M concentrates on the language arts processes and practices for middle school settings, grades 4-8, with an emphasis on interdisciplinary connections.

3 semester hours

ED 440J concentrates on the issues and pedagogy of teaching the English language arts and literature in secondary-level settings, grades 7-12.

3 semester hours

EDUCATION 441

Methods and Materials in Teaching Mathematics

This course deals with methods of teaching

mathematics. Materials are examined for their use in diagnosis, remediation and enrichment, as well as emphasizing planning and instruction using current state and national standards.

ED 441C concentrates on the scope and sequence, as well as appropriate activities, for the elementary level.

ED 441M concentrates on the appropriate practices for middle school, grades 4-8, with an emphasis upon interdisciplinary connections.

ED 441J concentrates on the content and methodology of mathematics for secondary students.

ED 441C — 2 semester hours

ED 442M, J — 3 semester hours

EDUCATION 442

Methods and Materials in Teaching Social Studies

This course assists students in developing competencies in unit planning, instructional strategies, and the utilization of diverse materials and technology for teaching the social studies. Students design courses of study that integrate state and national standards; contemporary thinking about the teaching of social studies is stressed.

ED 442C concentrates on the activities, planning, and materials for social studies in elementary classrooms.

ED 442M concentrates on the content, practices, and planning appropriate for the middle level, grades 4-8. Interdisciplinary possibilities are examined.

ED 442J concentrates upon appropriate content, planning, and practices for 7-12 classrooms.

ED 442C — 2 semester hours

ED 442M, J — 3 semester hours

EDUCATION 443

Methods and Materials in Teaching Science

This course introduces teaching approaches, instructional materials, and contemporary thinking about science education, as well as emphasizing planning and instruction using current state and national standards.

ED 443C concentrates upon the practices and materials of effective science for elementary level.

ED 443M concentrates upon the appropriate content and practices for the middle grades, 4-8. Interdisciplinary possibilities are examined.

ED 443J concentrates upon the appropriate content and practices for the secondary sci-

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ence curriculum.

ED 443C — 2 semester hours

ED 443M, J — 3 semester hours

EDUCATION 446

Methods and Materials in Teaching a World Language

This course familiarizes the student with the major purposes of the study of world language in the schools. It introduces the strategies and classroom activities for effective teaching. It examines appropriate materials for teaching world languages.

3 semester hours

EDUCATION 447

Methods and Materials of Teaching English as an Additional Language

This course explores the language needs of children who are learning English as an additional language. It reviews and explains effective methods and strategies for teaching such students. The most appropriate materials are identified and utilized.

3 semester hours

EDUCATION 450

Field Experience

This course is a structured observation in a private or public school. The goals of the course are to facilitate the candidate's awareness of self, of school pupils, and of prospective teachers. The course is an elective for other majors. The number of semester hours taken should be determined with the student's advisor. Two semesters of field experience are required a total of (6 credit hours); 3 credit hours each semester.

1-6 semester hours

EDUCATION 500

Research Techniques and Report Writing

This is an introduction to the research process, to the understanding of published research, and to the application of research findings to education. The course prepares the student to write formal papers and research reports.

3 semester hours

EDUCATION 503

Diverse Students: Differentiated Instruction

This course focuses on pedagogy based on the philosophy that each student is a unique learner and that instruction should be provided that meets the needs of diverse students. Methods for addressing the needs of students' diverse strengths, background, experiences, gender, linguistic, and learning styles will be presented. It is recommended that the course will be taken after completion of EDU 564:

Education of Students with Exceptionalities.

3 semester hours

EDUCATION 505

Intercultural Relations: Teaching and Learning in Multicultural Environments

This course presents an overview of theories about educational, social and cultural problems of minority culture students, about teacher perceptions and expectations, about parental involvement. The course also critically analyzes policies and practices of multicultural and bilingual education. The thrust of the course is to develop appropriate and non-biased methods of teaching all children.

3 semester hours

EDUCATION 509

Psychological Foundations in Education

This is concerned with the work of educators in general and teachers in particular. Topics include student characteristics (personality, growth, and development, adjustment, etc.) motivation, learning, measurement and evaluation, objectives, and teaching methods.

3 semester hours

EDUCATION 511

Statutory Requirements

This course addresses the topics required for Connecticut licensure in teaching, including topics in health and intergroup relations.

1 semester hour

EDUCATION 515

Clinical Experience—Internship Program

In the first semester interns will work under supervision in a learning environment, providing a variety of paraprofessional services to the schools.

In the second semester the internship is designed to provide (1) a more in-depth perspective of teaching and learning through the development of a portfolio and (2) an opportunity to reflect on and document the impact of the internship experience.

6 semester hours

EDUCATION 536

Adolescent Literature

This surveys books and periodicals emphasizing criteria for selection and evaluation, procedures for establishing a program of literature in the schools, and opportunities to explore the interpretation of literature in the classroom through drama, storytelling, book reporting, and choral speaking. Education 536C is focused on children's literature. Education 536J concentrates on adolescent literature. Education 536M concentrates on a pre-adolescent literature.

EDUC 536C — 2 semester hours

EDUC 536M/J — 3 semester hours

EDUCATION 537

Middle Grades Interdisciplinary Teaching and Teams

This course focuses on the developmental levels of the middle school student, appropriate instructional climates for middle grade classrooms, and interdisciplinary planning across subjects in English, History/Social Studies, Math, and Science.

3 semester hours

EDUCATION 540

American Culture and Education

This course addresses cultural issues related to education. Topics include multicultural issues in America and the interpretation of demography in relation to schooling. The search for national identity and educational alternatives are explored.

3 semester hours

EDUCATION 541

Classroom Management in Teaching English as an Additional Language

This course focuses on classroom management as an effective tool for a positive learning environment. Planning, implementing, and maintaining management procedures are discussed.

2 semester hours

EDUCATION 542

Theory and Methods of Teaching English as an Additional Language

This course addresses the foundations of second language learning theory, research, and discourse in educational settings. It also focuses on strategies for teaching dual language instruction with emphasis on a culturally responsive environment and on legal issues as they apply to schooling for English language learners.

3 semester hours

EDUCATION 543

Second Language Acquisition

This course provides an overview of the major theories of first and second language acquisition. It applies these theories to classroom pedagogy and examines the influences of parents, siblings, and peers, as well as aspects of formal and informal education. It also examines the influence of region, culture, class, and gender on language acquisition; legal and ethical issues relative to language competency are addressed.

3 semester hours

Education

EDUCATION 545

English Language and Literature for Teachers

The purpose of this course is to give prospective teachers of English as an additional Language (ESL) a rich knowledge of literature with potential classroom applications for multicultural settings. Selection and analysis of language processes and literature for elementary and secondary-level classrooms are included.
3 semester hours

EDUCATION 546

Linguistics for Teachers

This course acquaints teachers with the major analytical frameworks in linguistics. It surveys the discipline of linguistics, the study of human languages, contrastive features, and language systems.
3 semester hours

EDUCATION 558

Evaluation of Instructional Outcomes

This course gives students an orientation to the topics, issues, and concepts in the field of educational testing and measurement. Topics include methods for evaluating instructional programs, types of instruments for collecting data, and a variety of standardized, criterion-referenced, and performance-based assessments. The construction of teacher-made tests and the interpretation of different types of test scores are included.
3 semester hours

3 semester hours

EDUCATION 560M

Human Growth and Development, Middle

This course provides an opportunity for the study of the subject matter of human development, with a concentration upon the uniqueness of the adolescent period. Theoretical models and methods of researching human growth and development including cognition, physical, social, emotional and moral development will be studied. Genetic and environmental influences of human development will be discussed. Implications for classroom instruction in the middle grades will be explored.
3 semester hours

EDUCATION 564

Education of the Exceptional Student

The focus of this course is placed upon the instructional methods and materials for exceptional students. General management techniques and administrative procedures are considered in light of the student's special needs in order to identify and work effectively with the major categories of exceptionality, including the learning disabled, the handicapped, and the gifted, etc. Requirements of the 94-142

law are examined.

3 semester hours

EDUCATION 565

Contemporary Problems in Education I

This is a study of foundations, issues and contemporary trends in education with their application to teaching in the schools. An effort will be made to encourage teachers to develop an understanding of their own philosophy of education and how it affects their teaching.
3 semester hours

3 semester hours

EDUCATION 566

Contemporary Problems in Education II

This independent study fulfills the Final Degree Option for the Master's degree. Students pursue an individually planned project under advisement of a faculty member. Extensive reading supports the project. May be taken as an extension of ED 500 or ED 565.
3-6 semester hours

3-6 semester hours

EDUCATION 571

Diagnosis and Intervention of Reading and Language Arts Difficulties

This course examines the range of problems that cause students difficulties in literacy processes. It examines assessment instruments and strategies for intervention and instruction in Reading and Language Arts.

3 semester hours

EDUCATION 572

Advanced Diagnosis of Reading and Language Arts Difficulties

This course is for students interested in working with learners experiencing profound difficulty in reading, writing, and other literacy processes. Students learn strategies for assessing students referred for specific literacy instruction. Both individual and group diagnostic assessments are used. Students learn how to interpret testing results and make recommendations for improvement. Prerequisite: EDUC 571

2 semester hours

EDUCATION 573

Early Literacy Instruction

This course concentrates on the theories, instructional applications, and materials for the teaching, learning, and assessment of literacy processes in early childhood and up to grade 2. Topics include emergent literacy, phonological awareness, and phonic knowledge and instruction.

2 semester hour

EDUCATION 574

Developmental Reading in the Elementary School

This course focuses on the theories, instructional applications, and materials for the teaching,

learning, and assessment of literacy processes in elementary classrooms. Topics include strategies in word recognition, vocabulary development, and comprehension. The developmental needs of beginning readers are emphasized.

3 semester hours

EDUCATION 575

Reading and Writing in the Content Areas

This course focuses on the teaching and learning of comprehension and composing processes and strategies for content area disciplines. Critical reading and study strategies for expository text materials are emphasized.

3 semester hours

EDUC 575M concentrates on appropriate materials, strategies, and assessments for reading and writing in middle grade settings, 4-8.

EDUC 575J concentrates on the comprehension and composing processes of students in secondary-level settings, grades 7-12.

3 semester hours

EDUCATION 576

Developmental Reading in Middle Grade Classrooms

This course focuses on the theories, instructional applications, and materials for the teaching, learning, and assessment of reading and related literacy processes in middle grade (4-8) classrooms.

3 semester hours

EDUCATION 580C

Special Problems in Elementary Education

This is intended for students interested in independent study or research of a selected topic or problem in consultation with a faculty member. By arrangement. Faculty permission required.

1-6 semester hours

EDUCATION 580J

Special Problems in Secondary Education

This is intended for students interested in independent study or research of a selected topic or problem in consulting with a faculty member. By arrangement. Faculty permission required.

1-6 semester hours

EDUCATION 580L

Special Problems in Behavioral Science Research and Computer Applications

This course is designed to enhance the efficiency and scope of one's research through the development of specific competencies needed for computer processing. Students will be exposed to computer-assisted instruction (C.A.I.) and computer managed instruction (C.M.I.), and will develop projects that focus on computer applications. By arrangement.

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Lab fee required.
1-6 semester hours

EDUCATION 590

Computer Literacy

This is designed to provide the student with hands-on experience in the use and application. The student will have the opportunity to evaluate existing course work and its application as well as the writing of elementary programs in Logo and Basic. Lab fee required.
1-3 semester hours

EDUCATION 591

Software Evaluation

This is designed to have students develop software evaluation criteria for the purpose of evaluating published computer programs. The student will have an opportunity to review educational programs.
1-3 semester hours

EDUCATION 592

Technology Literacy for Educators

This course is an introductory to expose students to a variety of technologies used by and with persons with exceptionalities. Students will gain hands-on skills in designing technology-based instructional materials for students. A focus on Universal Design for Learning is a the core of this course with a goal of providing students with the ability to adapt technology, instruction, and assessment to meet a range of students needs.
3 semester hours

EDUCATION 595

Thesis Research — Masters Level

This is a culminating experience option at the Master's level for Education students.
2-6 semester hours

Educational Leadership

EDUCATIONAL LEADERSHIP 601

Introduction to Education Leadership

This is an investigation of concepts, research findings, and practices focusing on the development and change of educational organizations in relation to relevant goals and objectives. Emphasis is placed on such areas as leadership theory and behavior, organizational climate, human relations and communications within the organization, and change strategies. Theoretical concepts of leadership are integrated along with practical applications.
3 semester hours

EDUCATIONAL LEADERSHIP 611A

Organization, Administration, and Supervision of Reading and Language Arts Programs

This course focuses on the role of the Read-

ing and Language Arts Consultant as an educational leader in schools and school districts and focuses on issues of organization, administration, and supervision of reading and language arts programs. Note: Students enrolled in this course must also concurrently enroll in EDLD 611 Administration: Organizing, and Staffing Educational Institutions. While EDLD 611 focuses on the broader issues of educational leadership in schools, EDLD 611A specifically focuses on reading and language arts programs and personnel.
1 semester hour

EDUCATIONAL LEADERSHIP 613

Contemporary Issues in Education Leadership

This course will focus upon contemporary society and changing policy issues that confront managers and leaders of educational thought throughout the 21st Century. Seminal issues such as the impact of political forces upon federal, state, and local educational policies will be considered. Labor relations will be analyzed. Empowerment of teachers will be examined.
3 semester hours

EDUCATIONAL LEADERSHIP 613

Contemporary Issues in Education Leadership

This is an exploration of current topics and trends that impact education leadership. The course materials will explore current trends and topics utilizing journal articles, monographs, trade news outlets and social media.
3 semester hours

EDUCATIONAL LEADERSHIP 614

Leadership & Management of School Facilities

The course is designed to provide the prospective school leader with a comprehensive understanding of the various issues associated with managing and planning for school facilities that enhance teaching and learning.
3 semester hours

EDUCATIONAL LEADERSHIP 615

Research & Data Informed Supervision

This course is designed to increase students' knowledge, understanding, and competencies required for reading and conducting educational research. The course achieves this by reviewing key concepts related to the research problem, research hypothesis, sampling, data collection techniques, data analysis, and research designs.

EDUCATIONAL LEADERSHIP 618

Public School Finance

This is a study of educational fiscal control including: budget preparation and presentation, accounting procedures, tax structures, analyses of costs, comparative data and auditing. Includes federal, state and local phases of support of educational systems. Special emphasis is giv-

en to New York and Connecticut fiscal patterns.
3 semester hours

EDUCATIONAL LEADERSHIP 619

Public School Law

This is a study of the legal basis for public education in the United States; a study of state and federal statutes providing for education. An examination is made of statutes, court decisions, and policies and practices arising out of these factors. The legal status of boards, teachers, administrators, pupils and parents is examined with special emphasis on New York and Connecticut.
3 semester hours

EDUCATIONAL LEADERSHIP 621

Evaluation of School Effectiveness

This course examines the various ways to evaluate the effectiveness of a school's performance: student achievement, faculty performance, faculty morale, provision for diverse student needs and development of student emotional growth. The course examines how data can and should affect instructional issues.
3 semester hours

EDUCATIONAL LEADERSHIP 651

Curriculum Development and Implementation

This is a study and development of models for curriculum design and implementation at all levels of schooling. Emphasis is placed on current research and practice relevant to curriculum design and the planning and monitoring of curriculum plans in educational settings. Such topics as: curriculum assumptions, goals and objectives, knowledge and content, curriculum evaluation, implementation and staff development strategies are examined.
3 semester hours

EDUCATIONAL LEADERSHIP 652

Supervision: The Evaluation and Professional Development of Educators

This is a study of concepts and strategies focusing on the evaluation of teachers and other educators for purposes of performance improvement and quality assurance. Emphasis will be placed on research findings, current practices, and the achievement of competency related to classroom observation and evaluation, the planning and implementation of professional development, and the creation of organizational climate and human relationships conducive to effective evaluation and professional growth of educators.
3 semester hours

EDUCATIONAL LEADERSHIP 664

Supervision of Programs & Services for Students with Exceptionalities

This course is designed to prepare school ad-

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ministrators with the skills to supervise and implement appropriate services for students in need of response to intervention services and/or programs for students identified as in need of special education services. An emphasis is on service delivery models, due process procedures and supervision of specialists responsible for providing services to identified students.
3 semester hours

EDUCATIONAL LEADERSHIP 680A

Urban Leadership

This course is designed to introduce current research, challenges and successful practices of leading schools in urban settings.
3 semester hours

EDUCATIONAL LEADERSHIP 681A

Internship in Educational Management

A cooperatively guided administrative experience in a school system. Pre-requisite: Completion of major portion of the requirements for the Sixth Year Professional Diploma and permission of major advisor.
3 semester hours

EDUCATIONAL LEADERSHIP 682A

Special Topics in the Management of Educational Institutions

Special department offerings including workshops, conferences, institutes focusing on new developments in the field.
1-6 semester hours

EDUCATIONAL LEADERSHIP 683

Internship for the Reading and Language Arts Consultant

This course is a cooperatively guided administrative experience in the area of literacy education for those desiring to be certified as Reading and Language Arts Consultants. The internship includes a series of practicum experiences in a variety of school settings and includes research in the area of literacy education. Students gain practical field based experience through a range of tasks and situations characteristic of the position of the Reading and Language Arts Consultant in school settings.
6 semester hours

EDUCATIONAL LEADERSHIP 800D

Continuing Doctoral Seminar

The seminar meets periodically during the academic year and for two full weeks each summer, for three consecutive summers. It provides opportunities for students to work with scholars and leaders from a variety of disciplines to broaden perspectives on educational leadership and to develop an intellectual style for dealing with educational problems.
6 semester hours per year

EDUCATIONAL LEADERSHIP 801A

Educational Program Development

Emerging trends, concepts and practices in the planning, design, and implementation of education programs intended to meet the individual and group needs of learners in a changing society are reinvestigated. Emphasis is placed on the roles and responsibilities of leaders in such processes as school/community educational goal setting, needs analysis, systematic program design, supervision and staff development. Students will focus on the application of new knowledge to the investigation and solution of program development in the field.
6 semester hours

EDUCATIONAL LEADERSHIP 801B

CURRICULA THEORY AND PROGRAM DEVELOPMENT

This course provides an introduction to conceptions of curriculum and their effects on pedagogy from a historical perspective, with particular emphasis on discerning and interpreting how social, cultural, and political circumstances that shape educational practices. The course includes several projects focusing on the application of curriculum design principles and related instructional systems development. Emphasis is placed upon a historical overview of curricula theory and the current research and practice relevant to curriculum design, planning and monitoring in educational settings. Topics to be examined include the following: curriculum assumptions, understanding by design, concept-based curriculum and instruction, Curriculum for the 21st Century, alignment with the Common Core Instructional Standards, goals and objectives, knowledge and content standards, needs assessment and curriculum evaluation, the curriculum cycle, curriculum implementation strategies, and professional development strategies
6 semester hours

EDUCATIONAL LEADERSHIP 804A

Constitutional, Legal, and Political Issues Confronting Educational Leaders

Legal questions relating to personnel, students, community, religion, finance, school property, teacher organizations, equality of opportunity and other legal and political issues with which the educational leader must be familiar in order to be effective in decision-making and organizational development are investigated. Emphasis is placed on "landmark" judicial decisions, recent statutory developments, constitutional background. Students will read, analyze, and interpret significant Supreme Court decisions regarding educational matters as well as pertinent lower federal and state court

decisions. The principal of "non judicial" remedies will be explored and the appeals process will be examined in detail.

6 semester hours

EDUCATIONAL LEADERSHIP 804B

Constitutional Law

Legal questions relating to personnel, students, community, religion, finance, school property, teacher organizations, equality of opportunity and other legal and political issues with which the educational leader must be familiar in order to be effective in decision-making and organizational development are investigated. Emphasis is placed on landmark judicial decisions, recent statutory developments, and constitutional background. Students will read, analyze, and interpret significant Supreme Court decisions regarding educational matters as well as pertinent lower federal and state court decisions. The principal of non-judicial remedies will be explored and the appeals process will be examined in detail.

6 semester hours

EDUCATIONAL LEADERSHIP 806 A & B

Quantitative Analysis and Evaluation Strategies

This course considers current techniques for designing, implementing and analyzing projects in education and typical models for facilitating decision-making. The elements of personnel and program assessment within the contemporary educational system are included. Strategies focusing upon experiential learning and community contact are featured, and the student will be exposed to collection and analysis of real data and related computer simulation activities. Statistical and evaluative investigations are emphasized which are both fundamental and sufficiently sophisticated for advanced decision-making and leadership. This course is required.

6 semester hours

EDUCATIONAL LEADERSHIP 807A

Management of Educational Institutions (K-12)

Participants in this course will investigate the planning and finance functions relative to the management of educational institutions. The planning component, the relationship between planning and institutional decision-making, and problems of implementing planning activities in educational contexts are considered. Finance is addressed through the treatment of budget preparation and presentation, accounting procedures, tax structures, and the role of local, state, and federal governments in support of educational system.

6 semester hours

Educational Leadership

EDUCATIONAL LEADERSHIP 807B

Leadership Theories and Organization Management

This course investigates concepts, research findings, and practices focusing on the development and change of educational organizations in relation to relevant goals and objectives. Students investigate planning, financing and management of their own educational institution including budgets, accounting procedures, tax structures, and the role of local, state, and federal government. Emphasis is placed on leadership theories, organizational climate, human relations, and communication within organizations. The course covers a historical overview of organization and leadership theories and the culminating project is defining and defending a philosophy of leadership.

6 semester hours

EDUCATIONAL LEADERSHIP 808A

Human Relations, Communication, and Decision Making

This course will provide educational leaders with the necessary skills and knowledge to maximize the human resources within an institution. It will develop in participant's increased personal awareness, greater sensitivity to others, effective communications and appropriate strategies for change and decision making.

6 semester hours

EDUCATIONAL LEADERSHIP 808B

Program Evaluation and Human Relations

The structure of this seminar is three-fold. The impetuses, purposes, issues, and controversies surrounding human relations, assessment, and program evaluation with emphasis on organization development, teaching, and learning. Program evaluation techniques including multiple means of assessment will be discussed and considered. Concepts such as reliability, validity, credibility, and authenticity will be explored as well as summative and formative data collection and analysis strategies. The program evaluation approach will be applied to authentic experiences and scenarios that focus on assessing and evaluating institutions, programs, teaching, and learning. Research-based factors that are associated with effective schools and how to use various sources of data to evaluate and assess educational organizations and programs is also emphasized. The process of strategic planning as a vehicle to improve school effectiveness, the Connecticut Standards for School Leaders, and Common Core Standards all provide a framework for understanding the role and responsibilities of school leaders for school improvement.

6 semester hours

EDUCATIONAL LEADERSHIP 811

Intro to Research

Introduction to Research is an overview course in research methodology and evaluation techniques relevant to the conduct of qualitative, quantitative, action, and mixed methods studies of leadership, curriculum, teaching, and learning. Fundamentals of, quantitative, qualitative, action and mixed methods research will be introduced from five prominent dimensions: leadership, curricula, program evaluation, teaching, and assessment.

3 semester hours

EDUCATIONAL LEADERSHIP 810

Computer Application in Educational Leadership

This course covers creation of learning objects, including text, raster/vector graphics, animation, slideshows, conferencing components, and video for instructional Webs. Use of digital image capture equipment, including digital cameras, camcorders, and scanners. Also covers basic HTML, PDF and OCR. Final project will be integration of elements into an instructional Web.

6 semester hours

EDUCATIONAL LEADERSHIP 812

Quantitative Research

One of the greatest challenges faced by school leaders is harnessing the power of data to drive school improvement. To this end, in the present climate of rapidly emerging research findings and data-driven decision-making, today's leaders must be able to perform, analyze, and critically interpret statistics. Hence, this course is designed to prepare doctoral students to perform dissertation research by giving them fundamental understanding of the quantitative research methodology. Overall, this course will provide students with: (a) the fundamental of descriptive and inferential statistics necessary to manipulate quantitative information, (b) the necessary frameworks to describe, interpret, and critique the components of various quantitative research studies in education, and (c) the conceptual understanding of the experimental and non-experimental research methodologies.

3 semester hours

EDUCATIONAL LEADERSHIP 813

Literature Review

Literature review is designed to be taken in the summer of the first year after students have taken introductory research, quantitative research methods, and two six credit doctoral modules in the program. Conducting the literature review helps refine the student's proposal and prepares for writing the Human Subject

approval application.

3 semester hours

EDUCATIONAL LEADERSHIP 814

Qualitative Research

Qualitative research and evaluative Strategies introduces students to theoretical, paradigmatic and methodological research perspectives associated with the qualitative tradition. Case studies, grounded theory, ethnographic, and narrative approaches will be presented in this class paying particular attention to interpretive, critical, and participatory research techniques, methodologies and methods. Qualitative evaluation techniques used in program evaluations will be emphasized. EDUCATIONAL LEADERSHIP 814 introduces students to practical research techniques including the development of semi structured and open ended interview questions, how to conduct, record and analyze interviews, and the use of field notes when collecting observation data. Emphasis will be placed on understanding the ramifications of purposeful sampling, forms of credibility, the role of the researcher, and ethical dimensions associated with qualitative inquiry.

3 semester hours

EDUCATIONAL LEADERSHIP 815

Mixed Methods

Mixed method research introduces students to mixed-method research in the social sciences. Students should have some familiarity with research (quantitative and/or qualitative) and the epistemological and ontological underpinnings of the two methods as well as a basic understanding of their educational or social science research topic. This course completes the process of the proposal preparation expanding methodological and procedural techniques used in dissertation process. Specific objectives for this course include: (a) the history and language of mixed method research in education/social sciences; (b) summarization of current issues related to the paradigm wars and where mixed-methods research currently fits into education/social sciences; (c) advance understanding of research issued in educational/social sciences through discussions about paradigmatic compatibility, the current standing of mixed-methods in academic and political field, and the process and design of mixed-method studies; (d) proposal writing strategies including for mixed-methods research; (e) data sampling, collection and analysis strategies including for mixed method research; (f) reflections about the role of the researcher and their worldview in a mixed methods design. Although mixed-methods is an emerging dialog in education and social sciences, there are variety of sources

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available including keynote speeches, edited books, journal articles, editorials and seminal works from the leaders in the field cited in prominent mixed-method research publications. Supplemental articles and chapters will be provided depending on the students' level of interest and needs. Students preparing their dissertation will have these available these resources when expanding their methodology and procedures sections of their study.

3 semester hours

EDUCATIONAL LEADERSHIP 816

Action Research Project

The Action Research seminar is the second year summer project designed to help students understand how to conduct, evaluate and disseminate research. This culminating research projects starts after students have completed introduction (EDUCATIONAL LEADERSHIP 811), quantitative (EDUCATIONAL LEADERSHIP 812) qualitative (EDUCATIONAL LEADERSHIP 814) and mixed method research (EDUCATIONAL LEADERSHIP 815) in the second year of program. Conducting a collaborative action research projects helps refine practical research skills, presentation techniques, and the ability to publish.

3 semester hours

(3 Credits-Repeatable up to 2X)

Postsecondary Teaching Experience

EDUCATIONAL LEADERSHIP 817

Postsecondary Teaching

Post-secondary teaching provides students the opportunity to determine if working in higher education is preferred. This class is to be taken as a final class in the program course sequence. Repeatable up to 8 credits.

2 semester hours

(2 Credits Repeatable up to 4X)

EDUCATIONAL LEADERSHIP 845A

Dissertation Preparation Seminar

During the third year of the program, students participate in seminars which focus on the selection and development of a dissertation proposal. Students are ordinarily expected to complete the major portion of their work on the dissertation proposal prior to the conclusion of the formal part of the program. This course is required.

3 semester hours each term (Fall & Spring), 6 semester hours final summer

EDUCATIONAL LEADERSHIP 845B

Comprehensive Examination Preparation

During the third year of the program, students participate in this seminar in preparation for their 30 day, 3 question 45+ page comprehen-

sive examination. Students should only take EDUCATIONAL LEADERSHIP 845 after they have completed all of their courses or with the prior approval of their Chair.

3 semester hours

EDUCATIONAL LEADERSHIP 850A

Dissertation Research and Advisement

Individual research and advisement relative to a student's dissertation topic is the "sine qua non" of this course. Doctoral candidates are required to register for Education Management 850 continuously until their dissertations have received final approval. Prerequisite: Successful completion of Comprehensive Examination.

0 semester hours

EDUCATIONAL LEADERSHIP 850B

Continuous Dissertation

Individual research and advisement relative to a student's dissertation topic is the sine qua non of this course. Doctoral candidates are required to register for Continuous Dissertation 850 every semester (Fall, Spring and Summer) until their dissertations have received final approval. Prerequisite: Successful completion of EDUCATIONAL LEADERSHIP 845 Dissertation Proposal and EDUCATIONAL LEADERSHIP 846 Comprehensive Examination.

0 semester hours

EDUCATIONAL LEADERSHIP 864

Special Education for Administrators

Supervision of Programs & Services for Students with Exceptionalities.

This course is designed to prepare school administrators with the skills to supervise and implement appropriate services for students in need of response to intervention services and/or programs for students identified as in need of special education services. An emphasis is on service delivery models, due process procedures and supervision of specialists responsible for providing services to identified students.

3 semester hours

EDUCATIONAL LEADERSHIP 881A

Administrative Internship + CAT Exam

A cooperatively guided administrative experience in a school system. Pre-requisite: Completion of major portion of the requirements for the Sixth Year Professional Diploma and permission of major advisor.

3 semester hours + CAT Exam

Electrical Engineering

ELECTRICAL ENGINEERING 404

Digital VLSI

The objective of this course is to teach stu-

dents the CMOS transistor design in VLSI circuits. (CMOS stands for complementary metal oxide semiconductor.) Supported by CAD tools, students will learn gate level design, IC design, fabrication, and layout of digital CMOS integrated circuits. With these skills, students will also be able to interact with integrated circuit fabrication process engineers after completing this course.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 405

Statistics for Engineers

From elements of probability, probability distributions and descriptive statistics to hypothesis testing, confidence intervals, linear regression and correlation, analysis of variance and engineering applications to include quality control.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 410 (ELEG 410/BMEG 410)

Bio Sensors

This course will provide an interview of biosensors, including their use in Pharmaceutical research, diagnostic testing, and policing the environment. Topics include the sensitivity, resolution, selectivity, dynamic range, and noise of biosensors. Other topics covered include transducer phenomenology, biosensor structure, and sensor performance.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 411

Advanced PLC's (Programmable Logic Controls)

This course builds on PLC's (ELEG 464) by using sensors (both thermal sensors, motion sensors, and camera input) to control the automation process; topics in servo motors, variable frequency drives, and HMI (human machine interaction) and touch screens are also introduced both in theory and in a lab setting.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 413 (ELEG 413/CPSC 413)

Bioinformatics

The course covers algorithmic aspects of modern DNA and protein analysis. Topics include: (i) Reviews of DNA, RNA and Proteins, (ii) Genome rearrangements, (iii) Sequence Alignment and fast algorithms (BLAST), (iv) Genome expressions and DNA-microarray, (v) Phylogenetic trees, (vi) Protein docking and drug discovery, etc.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 415

Fiber Optics

Communication via light waves over fiber optics cables. Analysis of light emission and light detection. Absorption loss. Optical devices, connectors, splices and Local Area Networks

Electrical Engineering

(LANs). Pre-requisite: Physics 112 or equivalent.
3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 416

Fiber Optics Lab

Hands on experience with fiber optic hardware. Fiber properties, sources, detectors, splices, connectors. Design and test fiber optic transmission and receiver circuits for both analog and digital transmission. Pre-requisite: Electrical Engineering 415.
3 semester hours

ELECTRICAL ENGINEERING 417

Modern Electronics

See Electrical Engineering 348.
3 semester hours

ELECTRICAL ENGINEERING 428 (ELEG 428/BMEG 428)

Wireless Communications

Evolution of Mobile Radio Communications to cell phones and personal communications: 2nd and 3rd and 4th generation. Concepts include cell fundamentals, path loss, fading, ghosts, modulation techniques, equalization, speech coding and networks.
3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 430

Satellite/Wireless communication Systems

Detailing concepts and calculations from the entire field is enough to permit the kinds of analysis needed for major systems planning decisions. This course covers channel capacity, picture quality, signal to noise ratio, bit error rate, earth station antenna size and offers new materials on orbital mechanics and geometry. Pre-requisite: Electrical Engineering 441 or equivalent.
3 semester hours

ELECTRICAL ENGINEERING 431

Fields and Waves

Solutions of static electric and magnetic fields are derived from Maxwell's equations and Gauss's law. Approximation, including multipole modelling, are used where exact solutions to theory do not exist. Also, the computer is used to solve these problems exactly without approximations. The course also introduces time varying fields and their link to the creation and propagation of radiation.
3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 437

Microwaves

Passive and Active elements for the generation, modulation, amplification and reception of microwaves. Radar and other microwaves systems. Pre-requisite: Field Theory.
3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 440

Distribution Power System Design

A comprehensive study of modeling of the distribution of power system components and planning, including load characteristics, application of power transformers, design of transmission lines, distribution sub-stations, primary systems and secondary systems, voltage drop and power loss calculations, application of capacitors, harmonics on distribution systems, voltage regulation, fault calculation and protection.
3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 441

RF Communications

Spectral analysis; modulation and demodulation system analysis, including AM, FM, pulse modulation and transmission of digital information. Signal design and system considerations. Pre-requisite: Electrical Engineering 234.
3 semester hours

ELECTRICAL ENGINEERING 442

Digital Communications

Detection of noise in thermal noise. Digital sequences. Optimal filtering and statistical decision theory. Optimum receiver design criteria. Performance, configuration and trade-offs. Pre-requisite: Electrical Engineering 441.
3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 444

Power Electronics

Application of power diodes and power transistors in rectifier arrangements and voltage regulators. Properties and application in power converters, inverters and motor drives. Pre-requisite: Electrical Engineering 348.
3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 445

DC/AC Motor Drives

Application to control speed and efficiency of motors using conventional thyristors control as well as modern variable frequency drives.
3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 446 (ELEG 446)

MEMS (Micro-Electro-Mechanical Systems)

Basic micro fabrication techniques, MEMS materials and their properties, MEMS device design and simulation, MEMS packaging and assembly, signal testing and MEMS reliability analysis. MEMS industrial applications in various areas will also be discussed. Students used ANSYS FEM software to design and simulate their behavior.
3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 447

Semiconductors

Crystal fabrication: MBE, MOCVD, LEC, Bridge

Mann. Study material and electronic properties of single crystal Si, poly, a-Si, GaAs, GaN, SiC, Ge and II-VI compounds. Transport properties: Hall Peltier, resistivity, mobility. Analysis of capacitance and I/V data for pn, pin, schottky and hetero-junction devices. Pre-requisite: Mathematics 110.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 448

Microelectronic Fabrication

This class covers basic microfabrication processes for semiconductor and VLSI fabrication, including photolithography, plasma and reactive ion etching, ion implantation, diffusion, oxidation, evaporation, vapor phase epitaxial growth, sputtering, and CVD. Advanced processing topics such as next generation lithography, MBE, and metal organic CVD are also introduced. The physics and chemistry of each process are introduced along with descriptions of the equipment used for the manufacture of integrated circuits. The integration of microfabrication process into CMOS, bipolar, and MEMS technologies are also discussed. The purpose of this course is to provide students with technical background and knowledge in silicon microelectronic fabrication process. Upon finishing this course, students will be familiar with the basic semiconductor and VLSI microfabrication processes.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 449

Introduction to Wireless Sensor Networks

In recent years, tiny computing devices equipped with low-power radios and sensors—made possible due to advances in microelectronics and radio technologies—have obliterated the wall between the physical world and the cyber world, spawning a virtually unlimited number of new applications—some of them beyond our wildest imaginations. Successful design of these massively distributed wireless sensor networks requires a synergistic combination of multiple aspects: from the physical layer to decision algorithms and more. This course will introduce the students to the application areas, various challenges commonly faced in this application, state-of-the-art solution techniques and fundamental those have emerged in the recent years.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 451

Introduction to Nanotechnology

Nanotechnology is the science and engineering involved in the design, synthesis, characterization and application of materials and devices with the size in nanometer (10-9m) scale. As a

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newly emerged exciting high-technology, it has attracted intensive interest and heavy investments around the world. Nanotechnology is a general-purpose technology which will have significant impact on almost all industries and all areas of society. It can offer better built, longer lasting, cleanser, safer and smarter products for home, communications, medicine, transportation, agriculture and many other fields. This course will cover basic concepts in nanoscience and nanotechnology.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 453

Pattern Recognition

Operation and Design of systems that recognize patterns in data, based primarily on statistical and neural network approaches. Topics include Bayesian decision theory, Parametric likelihood estimation, Nonparametric techniques, Linear discriminant functions and Neural Networks.

ELECTRICAL ENGINEERING 454

Introduction to Audio Signal Processing

To introduce the fundamentals of speech processing and related applications. Course covers speech enhancement, speech coding, and speech recognition.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 458 (ELEG 458/CPEG 458)

Analog VLSI

Modeling, design and analysis of analog VLSI circuits. CMOS processing and layout, current mirrors, Opamp, comparators, S/H voltage references, switched-capacitor circuits, data converters, filters and PLLs. Students design analog VLSI layouts, extract the netlists and simulate the circuit behavior. Transistors sizing will also be discussed. EDA tools PSPICE, Mentors Graphics are used.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 459

Audio Processing Lab

Introduction to TMS320C55x Digital signal Processor, Audio Signal Processing, Basic Principles of Audio Coding, Speech Enhancement Techniques, Quantization of Audio signals, Calculating LPC coefficient using C55x Intrinsic, Matlab Implementations of noise Reduction (NR), Mixed C55x Assembly and Intrinsic Implementations of Voice Activity Detection (VAD), Combining AEC with NR, Voice over Internet Protocol Applications, Overview of CELP Vocoders.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 460

Controls

Analysis of steady state and transient response

of control systems. Laplace transforms methods. Transfer functions. Stability criteria. Nyquist, Bode and root locus methods. System stabilization. System Design.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 461

Controls Lab

Laboratory study of feedback control systems with experiments analyzing different types of plants, transducers and control techniques; emphasis on real-time computer control.

3 lab hours; 3 semester hours

ELECTRICAL ENGINEERING 462

Advanced Controls

This is a graduate level course and aims to introduce the analysis of nonlinear system. The course will cover: the state space description of nonlinear system; the phase portrait analysis of the second order system; stability analysis of the nonlinear system based on linearization method; the Lyapunov stability theory, etc.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 463

Industrial Controls

This course covers the basics of Industrial Controls, including but not limited to relay control, ladders, counters, timers, switches, and all electrical components necessary to program the control of a large machine.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 464

PLC's (Programmable Logic Controls)

This course will start with the basics of Boolean Algebra; it will cite the differences between PLC control and relay control and full automation of major machines and appliances; the differences in these controls will show how hard relay control is to implement and how flexible PLC control actually is; many different math functions will be analyzed and implemented in the theoretical construction of fully functioning PLC.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 466

Adaptive Controls

Adaptive Controls provides a graduate level introduction to the basic concepts, techniques, and the state-of-the-art of adaptive control systems. Upon completion of the course, students are expected to be able to conduct design, research, and development in the field. The course covers real time system identification algorithms, model reference adaptive control, pole assignment adaptive control, self-tuning and gain scheduling control systems, stochastic adaptive control, model-predictive control,

and robustness issues of adaptive control systems. Prerequisites: Digital Control System (or equivalent)

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 479

Solar Energy and Solar Cells

This course offers a review of renew-able energy (solar, winds, and tides) versus bio-energy (coal, oil, natural gas). The concept of light as electromagnetic radiation and pure energy as well as the concepts of converting sunlight into thermal energy will be discussed. Students will learn the semiconductor and electronic properties of solar cells, used to convert light into electricity. Secondary solar energy sources include solar Hydrogen and concentrator technology.

3 semester hours

ELECTRICAL ENGINEERING 481

Analog Electronics Lab

With a set of 6 experiments and simulating them using P-Spice, the goal of this course is to teach the concepts from the theory of analog electronics. The user must have solid understanding of the basic electronics and circuit theory aka Network Analysis. Pre-requisite: Electrical Engineering 348, 234 or equivalents.

3 semester hours

ELECTRICAL ENGINEERING 482

Analog Integrated Circuit Design

Do a complete analysis of the 741 op-amp, including bandwidth, gain analysis, slew rate, power efficiency and I/O impedances. Analyze ROM, Ram, TTL, ECL, CMOS and more modern logic structures including Fanout, noise margin, latching, contention, logic and delay response. Pre-requisite: Electrical Engineering 348.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 483 (ELEG 483/MEEG 483)

Digital Integrated Circuit Design

Several integrated circuit architectures are analyzed at the transmitter level to find key parameters by hand analysis as well as computer simulation: rise time, fall time, noise margins, logic state, hysteresis/memory, fanout, and power dissipation. Analysis includes an analysis of the major logic families: TTL, CMOS, NMOS, ECL, PECL, differential logic.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 490

Alternative Energy Technologies

This is a graduate level course and aims to introduce the alternative energy technologies in photovoltaic cells (PV) and fuel cells. It will cover: the physics, energy conversion efficien-

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cy, and challenges in PV cells, the principles, the stack and system design in fuel cells.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 500

Graduate Co-op/Internship in Electrical Engineering

By arrangement.

1-3 semester hours

ELECTRICAL ENGINEERING 510

Medical Machines

Electrical safety is studied by full analysis of grounding and modeling of the human body under various electric shock conditions. The ECG machine (for measuring heart performance) is analyzed as both an analog and a digital machine, with emphasis on cleaning up signal problems and extending the analysis of the data recorded. Other instruments that are analyzed include the blood sugar tester, the hospital thermistor, the lung pressure machine, the anesthesia vaporizer, the pulse oximeter and various cardiac output devices. Discussion made about the minimum alveolar concentration (MAC) as it applies to anesthesia. Discussion is also made about modern hearing aids and advances in eye replacement via electrical means. Pre-requisite: Electrical Engineering 348, 234 or equivalent.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 542

Advanced DSP (digital signal processing)

(1)review briefly the concepts of DSP (E443), including digital filter design and windowing (2) Carry on with new topics in Adaptive Filters, Wiener Filters, Kalman filters, power spectrum and related topics, statistical signal processing, and stochastic processes.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 543 (ELEG 543/BMEG 543)

Digital Signal Processing Lab

Centered on a set of experiments for the ADSP21061 and ADS21065L, the goal of this course is to teach how to program the ADSP21061 and ADS21065L using visual DSP++ and MATLAB and illustrate concepts from theory of digital signal processing. The user must have solid understanding of DSP algorithms as well as an appreciation of basic computer architecture concepts. Pre-requisite: Electrical Engineering 443 or equivalent.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 544

Wavelets and Filter Banks

This course is offered to provide students with the basic understanding of the wavelet theory along with multi-resolution signal processing

tools, which can be employed effectively to solve practical signal processing and analysis problems. The first half of the course introduces wavelet transforms from an engineering point of view. The topics covered include short time Fourier transform, continuous wavelet transform, and discrete wavelet transform and filter banks. The second half of the course presents a number of interesting applications of wavelets based advanced signal processing techniques such as filter banks, multi-rate signal processing, wavelet packets and lifting algorithms in areas of image compression, signal de-noising, signal estimation, signal enhancements, and transient detection etc. Prerequisites: Basic Digital Signal Processing Course.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 546 (ELEG 546/MEEG 546)

Biomedical and Biometric Signal Processing

The course teaches all of the basics of image processing as applied to biometrics analysis and medical imaging.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 548 (ELEG 548/CPEG 548)

Low Power VLSI Circuit Design

With the rapid development of mobile computing, low power VLSI design has become a very important issue in the VLSI industry. A variety of low-power design methods are employed to reduce power dissipation of VLSI chips. This course is designed to cover low-power design methodologies at various design levels (from system level to transistor level). The basic low-power design strategies will be introduced in the class. Students will use the learned knowledge to design low-power VLSI circuits. Upon completion of this course, students will be able to analyze the power consumption of VLSI circuits, and design low-power VLSI circuits using various strategies at different design levels. The major target is to design VLSI chips used for battery-powered systems and high-performance circuits not exceeding power limits.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 549

VLSI Testing

As VLSI continues to grow in its complexity, VLSI testing and design-for-testability are becoming more and more important issues. This course will cover VLSI testing techniques such as VLSI fault modeling (stuck-at-fault), automatic test generation, memory testing, design for testability (DFT), etc. VLSI scan testing and built-in self-test (BIST) will also be covered. Student will learn various VLSI testing strategies and how to design a testable VLSI circuit.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 550

VLSI: Digital System Design

This course will provide students with an in-depth understanding of the basic design methodologies of modern digital VLSI systems. Various perspectives of VLSI systems will be discussed, such as MOS transistor device characteristics, interconnect, time and power, clock distribution, packaging and I/O issues, VHDL system design and logic synthesis. Upon completing this course, students will have a comprehensive understanding about digital VLSI system design.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 552

Random Signal Processing

Introduces students to the theory of probability and stochastic processes. Topics include basic probability; single and multiple random variables; stochastic processes such as Gaussian processes, Markov processes; Various applications.

3 lecture hours; 3 semester hours

ELECTRICAL ENGINEERING 562 (ELEG 5623/MEEG 562)

Nanofabrication with Soft Materials

This is an advanced level graduate course focusing on fabrication of soft materials. Nanofabrication processes and nanosystem products will be discussed. Fundamentals associated with chips fabrications and linking them toward soft materials assembly will be detailed. Emerging nanotechnology based methods for soft and green electronics, mechanical parts, MEMS, PCBS will be covered. Gene chip, label free sensory assay using micro and nanofluidics will be discussed. Transfer printing, DNA-protein interactions using the chip and several nano-scale assemblies for soft materials fabrication will be discussed.

3 semester credits

ELECTRICAL ENGINEERING 596

Seminar

Lecture hours and topics to be arranged with instructor.

1 credit hour

ELECTRICAL ENGINEERING 597

Master's Project

Lecture hours and topics to be arranged with Department Chair.

3 credit hour

ELECTRICAL ENGINEERING 598

Thesis in Electrical Engineering

Lecture hours, semester hours and topics to be arranged with Department Chair.

3-6 credit hours

Electrical Engineering • Engineering • Finance

ELECTRICAL ENGINEERING 599

Independent Study in Electrical Engineering

Independent study of advanced topics in Electrical Engineering and submission of project report as required. Problem assignment to be arranged with and approved by the Department Chair.

3 credit hours

Engineering

ENGINEERING 111

Introduction to Engineering

This course introduces the student to the engineering design process on a beginning level. Emphasis is placed on the structure of the design process involving problem definition, development of alternatives, analysis, decision making and iteration. One guided design project and one independent project are completed by student project teams. Concurrent lectures and homework assignments develop skills in data management, mechanics, chemistry, electrical theory, energy and economics. Personal computer usage is emphasized for mathematical calculations and the preparation of engineering reports. Prerequisite: MATH 109.

3 semester hours.

ENGINEERING 300

Economics and Management of Engineering Project

The design process, engineering economics, project planning and ethics in engineering practice. Prerequisites: MATH 215, PHYS112 and junior standing.

3 semester hours.

ENGINEERING 400

Engineering Colloquia Series

This course is a series of seminars covering a spectrum of engineering topics. National and international distinguished speakers are invited to deliver the seminars. All Engineering students are required to register for the colloquia series.

1 semester hour

ENGINEERING 404

Optimization

Optimization is the maximization of an objective function involving multiple variables, subject to certain constraints. This course introduces the theory and application of optimization. Topics discussed include optimization, linear programming, the simplex algorithm, transportation, assignment, decision analysis. Software used includes Excel spread sheet and LINGO.

3 semester hours

Finance

FINANCE 400

Financial Management

This course provides students with the opportunity to learn the basic tools and concepts of financial management. It will discuss important issues in modern finance, including the time value of money, valuation of stock and bonds, capital budgeting, risk and return trade-off, portfolio analysis, capital asset pricing model and financing decisions. Basic accounting and statistics are essential to understanding the principles developed in this course. Prerequisites: Admission to graduate study.

3 semester credits

Prerequisites: FIN 400 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

FINANCE 505

Advanced Financial Management and Policy

This course provides a general survey of the body of knowledge of corporate finance. Corporate finance is an area of finance dealing with the financial decisions corporations make and the tools and analyses used to make these decisions. The primary goal of corporate finance is to enhance corporate value and shareholder's wealth. To achieve this goal, financial managers must make important decisions such as project evaluations and investment decisions, financing decisions and dividend decisions. A solid understanding of the financial markets is also essential. The main concepts and principles in the study of corporate finance are also applicable to the financial problems of all kinds of firms. Basic accounting and statistics are essential to understanding the principles developed in this course.

3 semester credits

FINANCE 510

International Accounting

This is an introductory course about international financial management with special emphasis on multinational enterprises (MNEs). A MNE is defined broadly as one that is incorporated in one country but has operating subsidiaries, branches or affiliates located in other countries. Today, almost all large companies are multinational with the 1,000 largest MNEs accounting for about 80% of the world's industrial production. Main topics to be covered in this course include the foreign exchange market, exchange rate determination, foreign exchange risk management, and global debt and equity financing. The global financial environment such as the

international monetary system and the balance of payments are also discussed. Prerequisites: FIN 400 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

FINANCE 520

Investment Analysis

This course provides a framework for the analysis of individual securities such as stocks, bonds and other financial instruments. It develops a systematic framework for the construction of efficient portfolios and optimal investment strategies. It also discusses the investment environment that includes the financial markets and major financial institutions, the Federal Reserve, and the determination of interest rates. Various investment strategies used by practitioners are also discussed. Prerequisites: FIN 400 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

FINANCE 530

Technical Analysis and Trading

This is a hands-on course that teaches principles and methods of selecting and managing stocks using professional trading software. Theoretical concepts and trading principles will be taught throughout the course and students will manage an e-portfolio in real-time with imaginary funds. Prerequisites: FIN 400 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

3 semester credits

FINANCE 540

Financial Analysis and Modeling

This course introduces important financial models and shows how they can be solved numerically and/or simulated using computer technology (e.g. Excel). This class covers standard financial models in the areas of corporate finance, financial statement simulation, accounting model, portfolio problems, options, portfolio insurance, duration, and immunization. It will give tools for understanding the computational intricacies in finance. Too often, finance courses stop short of making a connection between textbook finance and the problems of real-world business. This course bridges this gap between theory and practice by providing a nuts-and-bolts guide to solving common financial and accounting models with spreadsheets. Prerequisites: FIN 400 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

3 semester credits

Finance • Global Development and Peace

FINANCE 545

Financial Derivatives and Risk Management

This course covers financial derivatives such as forward contracts, futures contracts, options and swaps. A derivative is a financial instrument that is derived from the value of an underlying asset. The underlying asset can be commodities, equities, bonds, foreign exchange, or indices such as a stock market index, consumer price index or even an index of weather conditions. These derivatives can not only be used for speculation and arbitrage, but more importantly, can also be used for risk management. Students will develop a working knowledge of how these derivatives are used and how they are priced. Prerequisites: FIN 400 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

FINANCE 550

Cases in Finance

The focus of this course is the application of managerial finance principles (from FIN400: Financial Management) to the financial decisions made by business. The purpose is to develop student analytical ability through the discussion and analysis of finance cases. Topics covered include financial concepts and planning; valuation, rates of return and leverage; cost of capital; dividend policy; sources and uses of investment and working capital; and international finance. Prerequisites: FIN 400 and completion of all core courses or concurrent registration in final core courses.

For the Global Financial Services concentration, this course should be taken as the final required Global Financial Services course.

3 semester credits

FINANCE 555

Management of Financial Institutions

This course covers the management of financial institutions (FIs), including depository institutions such as commercial banks and savings institutions, insurance companies, securities firms and investment banks, mutual funds, and finance companies. The focus is on risk measurement and management facing these FIs. The roles and operations of financial markets and various financial instruments and the impact of interest rates on the economy will also be discussed. Prerequisites: FIN 400 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

3 semester credits

FINANCE 570

Managerial Economics

Managerial economics deals with the ap-

plication of economic theories to real-world business decisions. A course in managerial economics provides students with the fundamental analytical tools that can and should be used in marketing, finance, production, and strategic management. Managerial economic techniques seek to achieve the objectives of the business organization in the most efficient manner, while considering both explicit and implicit constraints on achieving the objectives. Some basic quantitative skills such as statistics and calculus are required. Prerequisites: ECON 400, MGMT 400, FIN 400 and completion of all core courses or concurrent registration in final core courses. This course may be taken as an elective with required Finance and Management concentration courses.

3 semester credits

FINANCE 525

International Financial Management

This is an advanced course in international financial management. It will cover various aspects of financial management of multinational enterprises (MNEs), including the foreign exchange market, currency derivatives, global financial markets, international portfolio investment, cross-border direct investment, and foreign exchange and interest rate risk management. Prerequisites: FIN 600 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses. Prerequisites for International Business: FIN 600 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

Global Development and Peace

GLOBAL DEVELOPMENT AND PEACE 401-501

Graduate Seminar in Qualitative Methods

This course is designed to introduce the student to qualitative research methods. Topics might include Content Analysis, Fieldwork and Observation, and Interviewing. The use of Grounded Theory will be examined as well as methodological issues of data collection, reduction, display, and interpretation. It is recommended that the student have a familiarity with quantitative research methods before taking this class, as this class will build on previously explored research topics.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 402-502

Graduate Seminar in Quantitative Methods

This course is designed to build upon the students' previous research methods experience. Assuming a familiarity with survey re-

search as a methodology, this course will examine further quantitative research methods and procedures. Key emphasis will be placed on regression analysis and other statistical means of data interpretation, such as ANOVA, MANOVA, t-Tests, f-tests and others.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 411-511

Issues in Economic Development

Course Description: This course explores current issues in economic development including poverty and poverty alleviation, strategies to overcome poverty and underdevelopment including microfinance, the roles of multilateral financial institutions, globalization, and the Washington Consensus. The course will also explore the roles of regional arrangements and development institutions in attempts to overcome underdevelopment. The theoretical underpinning of the course lies in the many schools of thought that have produced explanations of the causes and consequences of development and underdevelopment. The course attempts to plot strategies to achieve goals of economic development.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 422-522

International Conflict Negotiation

This course examines theories about and sources of conflict (resource allocation and shortage; ideological, religious, and cultural disagreement; power distribution; perceptions of security; etc) to set the stage for conflict analysis and negotiation. In conflict analysis, the impact of cultural-linguistic systems on agreements and disagreements is examined. Culturally sensitive strategies of negotiation, conflict resolution, and mediation also are examined and practiced. Students will write several case reports on situations of conflict and also prepare a medium-length (20 pp. or so) term paper.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 427-527

Culture and International Development

The course will examine development theory and the underlying cultural assumptions of Western models of socioeconomic development. It will also study the innovative non-Western models of development such as micro-credit in South Asian and the Confucian-influenced models of development in parts of East and Southeast Asia. This course will identify the ways in which Western cultural assumptions can clash with the cultural underpinnings of many less developed countries. Using the case study method, learners will identify ways in which potential clashes

Global Development and Peace

are anticipated based on a region's history and its cultural underpinnings. Learners will assess the strategies currently used to address development-related challenges and, when appropriate, propose alternative strategies.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 460

Sustainable Development

The course will examine the critical relationship between oil supply and demand and environmental challenges and the international priorities and policy initiatives of modern states. In looking forward into the 21st century, the course will identify and assess the policy options available to major international players, including the United States and the European Union; Saudi Arabia and other major oil producing countries; Japan, China and India and other consuming countries; transnational energy companies and non-governmental organizations (NGOs). Environmental concerns will be examined and policy options will be assessed within the context of sustainable economic development.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 500

Graduate Co-op/Internship in Global Development and Peace

Students may complete a curricular practical training that reflects the competencies that the students has developed in the Global Development and Peace program. Students need to have their supervisor in the training certify satisfactory task performance and students must submit a written evaluation of their experience.

1-3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 521

Inequality, Poverty and Globalization

This course examines two key issues for the international community in an era of globalization: inequality and poverty. Various theoretical, historical and empirical approaches will be used in analyzing the causes and consequences of inequality and poverty for the developing world. Students are also encouraged to develop economic, political, cultural, and social solutions to the chronic issues of poverty and inequality in the world.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 523

Peace and Development

This course examines the relationship between peace and development. Security of the state, community, and the person is related to modalities of conflict – ethnic, ideological, religious – and their combined roles in retarding development. The course draws on regional examples

and studies of conflict analysis, peacemaking, and the changing face of development. The course also examines strategies to overcome conflict and achieve development goals.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 524

Political and Economic Integration

This course explores models of integration – functionalism, customs union, political integration, and federalism. Dual legislative systems are examined as instruments of harmonization of laws, and the roles of secretariats as vehicles of transition are explored. The course considers historical and contemporary models including the Federation of the West Indies, and the European Union. The course examines shortcomings of, and successful attempts at, political and economic integration.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 528

Global Economy and Terrorism

This course identifies the underlying conditions needed for the realization of a stable global economy and it highlights the ways in which terrorism impacts on the stability of markets and on investment and lending trends and on interest rates in affected regions and states. The course also explores the “practical” rationale for terrorism as well as terrorism’s ideological and philosophical roots as well as the actual historical trajectory of terrorist organizations and states. Through the case study method, we will review those venues where terrorism has been diffused and attempt to understand such developments and their applications to contemporary society.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 529

Political Economy of Migration

This course explores the constants and variables of immigration. The course will also consider the extent to which overseas investment in less developed countries and the strengthening of regional customs unions and the WTO will affect immigration trends. Due to the gap in the quality of life in developed versus less developed countries as well as the ongoing demand for cheap, unskilled labor, the number of immigrants to the developed world continues to grow in the United States and in the European Union. This Course also invites learners to assess how the growing demographic of immigrants and their children may affect voting patterns, public education, and the foreign policy priorities of the developed societies where they tend to settle.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 533

Cultural Dimensions of Globalization

While recognizing that a developing consensus exists on economic globalization, this course explores the broader cultural and philosophical implications of globalization. Extending beyond economic globalization to the social, political and cultural dimensions, one must indeed explore the substance of what is being “globalized” in each of these aspects of public life. This course invites learners to grapple with the question of whether or not the world is ready to implement an expanded globalization or whether a “dialogue among civilizations” is a necessary intermediary step in the process.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 537

Global Communication and Mass Media

This course examines media’s role in global communication and nation building. In particular it studies information flow, media and development, communication and telecommunication policies, transnational media corporations and their role in economic development, media and public diplomacy, international journalism, and information and public campaigns.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 560

Sustainable Development

This course focuses on issues related to sustainable development and preservation of the environment. To a significant extent, the course is reliant on the case study method. Through a geographically diverse series of case studies, the course will highlight the challenges faced by the development process due to the unmet social and quality of life demands of growing populations in less developed countries vis-à-vis the need to preserve and maintain the environment and endangered ecosystems. Through the case study method, strategies for caring for threatened energy resources will be assessed. The course will also use the case study method to understand the challenges that exist in developing strategies of economic growth that allow for significant improvement in the quality of life of local populations as well as the protection of wetlands, endangered species, hydrologic cycles and clean water supply.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 591

Internship

Students will complete an eight-week cross-cultural internship with international organization or overseas school, agency or company. A written report by the student and an as-

Global Development and Peace • Global Media and Communication Studies

assessment of the Student's performance by the agency where the student interns will be submitted as the basis of evaluation.

3 semester hours

GLOBAL DEVELOPMENT AND PEACE 598

Tutorial

The tutorial is offered at the completion of the internship. The tutorial invites students in the Master of Arts in Global Development and Peace program to reflect on their internship experience based on the student's experiences prior to and during the tutorial. The tutorial also prepares students for the program's comprehensive exam that includes both an oral and a written component and is conducted in the final weeks of the tutorial class. As a part of the tutorial students also assemble a portfolio of all of the major papers and projects that they have completed during the program and a written reflection on that work. Prerequisite courses: GLDP 591 and completion of at least 21 semesters hours of the GLDP program.

GLOBAL DEVELOPMENT AND PEACE 599

Thesis

As a final project demonstrating competency, students are asked to write and defend a thesis.

3 semester hours

GLOBAL DEVELOPMENT AND PEACE 600

Thesis Extension

1 semester hour

The following courses taught by the School of Business also are available to Global Peace and Development students. Full course descriptions are available under the primary course listings.

MGMT 561

Economic, Regulatory, Political, Cultural and Societal Issues in Environmental and Energy Management

MGMT 560

Foundations of Environmental and Energy Management

MKTG 560

Global Market Management

FIN 525

International Financial Management

FIN 530

Technical Analysis & Trading

MGMT 555

Global Program and Project Management

MGMT 534

Strategic Sourcing and Vendor Management

MGMT 523

Leadership, Teams & Managing Change

MKTG 560

Global Market Management

MKTG 535

e-Marketing

MGMT 585

Product Management, Innovation and Commercialization

Global Media and Communication Studies

GLOBAL MEDIA AND COMMUNICATION STUDIES 500

Graduate Co-op/Internship in Global Media & Communications

Students may complete a curricular practical training that reflects the competencies that the students has developed in the Global Media and Communication Studies program. Students need to have their supervisor the training certify satisfactory task performance and students must submit a written evaluation of their experience.

1-3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES/GLDP 501

Graduate Seminar in Research Methods

This is an introductory course in qualitative and quantitative research methods. It is designed to introduce you to basic concepts and issues (statistical, analytical, and ethical) encountered in research investigation. We will discuss what research is, the tools of research, research design, and writing the research report. Included will be an introduction to a diversity of research methods, including survey, historical research, experimental methods, content analysis, and so forth. An overview of statistical means of data interpretation also will be presented, including correlation, t-tests, ANOVA, ChiSquare Test, Sign Test, regression analysis, and so forth.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES 511

Communication Theories

This course focuses on communication theories. Major communication theories in the areas of information processing, persuasion, influence, decision-making, conflict resolution, group communication, intercultural communication, organizational communication, media communication, new media communication, social media and culture, media effects, and public opinion will be studied.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES/GLDP 522

Conflict Analysis and Resolution/International Conflict and Negotiation

This course examines theories about and sources of conflict (resource allocation and shortage; ideological, religious, and cultural disagree-

ment; power distribution; perceptions of security; etc) to set the stage for conflict analysis and negotiation. In conflict analysis, the impact of cultural-linguistic systems on agreements and disagreements is examined. Culturally sensitive strategies of negotiation, conflict resolution, and mediation also are examined and practiced.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES/GLDP 529

Advanced Intercultural Communication

This course studies different cultures around the world. In particular, it examines value systems, gender roles, and family structures. It will also examine the relationship between culture and religion, culture and economic development, culture and media, culture and new media, and culture and human development.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES 535

International Advertising and Public Relations

This course focuses on the theoretical and practical aspects of international advertising and public relations. In particular, it examines the characteristics, problems, and challenges in the areas of international advertising and public relations. It also studies how media and new media are used for advertising and public relations in an international setting. Business, economic, cultural, social, and political factors will be analyzed in the context of international advertising and public relations.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES/GLDP 537

Global Communication and Mass Media

Critical study and applications of theories and principles of global communication and mass media. Analysis of the roles traditional media, new media, and media professionals play in politics, governance, and international relations. Examination of how media systems work in different countries, how journalists cover news and events, how information flows globally, and what impact information flow creates to countries and peoples around the world.

3 semester hours

MGMT 539

International Issues

This course focuses on current international issues that affect business operations at home and abroad. Changing business environments are discussed and analyzed. Students are required to formulate new global business strategies in light of emerging international trends and events. In some cases, students may supplement their study by field trips and on-site analysis. Prerequisite: MKTG 400.

3 semester hours

Global Media and Communication Studies • Health Sciences

GLOBAL MEDIA AND COMMUNICATION STUDIES/GLDP 543

Communication and National Development

The focus of this course is on communication and national development and nation building. Students will learn how media, communication, information, and media technology are used and can be used to improve economic, political, and cultural conditions of people around the world. In particular, the course will look into the functions media communication, social media networking, and social marketing demonstrate in reducing poverty, combating hunger, improving literacy, promoting public health care, fighting corruption, and protecting the environment among others.

GLOBAL MEDIA AND COMMUNICATION STUDIES 546

Media Business and Management

This course examines media industry from business and management perspectives. It focuses on business concepts, media management theories, and the impact of digital media on the media industry landscape.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES 552

Advanced Web Publishing and Design

This course focuses on Web Publishing and Design methods using current Web design and graphic tools. Students will learn the techniques and tools to create Web sites and learn to maintain the Web sites for clients and consumers.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES 555

News Media and International Journalism

This course focuses on how international news is gathered and reported and how journalists should cover international news. The course also examines the issues of international news media and foreign relations.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES 557

Political Communication and Public Diplomacy

This course focuses on the relationship between media and politics and media and public diplomacy. It will also examine the issues of freedom of speech and freedom of the press, media as mouthpiece or watchdog. The course will also study how media are used in governance, how public opinion is formed, shaped, and influenced, how political and public agenda are set, and how media can be used for public diplomacy.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES 562

Media Communication Law and Legal Issues

This course examines the federal, state, and local laws that most directly affect mass com-

munication in the United States. It will also look into the judicial systems in other countries. Issues covered will include freedom of speech, freedom of the press, libel, invasion of privacy, news gathering, source protection, copyright, and truth in advertisements.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES 572

Advanced Multimedia

This course focuses on advanced multimedia technology and techniques. Students will learn the most current tools, software, and techniques to create and edit multimedia digital videos to be used for multiple mediums and platforms.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES 591

Internship

The Graduate Internship is completed once the student has completed at 21 credits in the GMCS program. It serves as the venue in which students can accomplish two important outcomes, i.e., they can apply the foreign language that they have been studying in an overseas setting (international GMCS students may do their internship in the US if they already speak a second world language in their home country rather than English) and they can intern in an agency or organization where the skills that they have acquired in the GMCS academic program can be put into practice. New Media students will be expected to complete a project or portfolio, which demonstrates their ability to communicate cross-culturally in the New Media environment. Global Communications students will produce a project demonstrating the ability to communicate interculturally in a business, government or NGO setting.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES 599

Tutorial

The tutorial is offered at the completion of the internship. The tutorial invites students in the Master of Arts in Global Media and Communication Studies program to reflect on their internship experience based on the student's experiences prior to and during the tutorial. The tutorial also prepares students for the program's comprehensive exam that includes both an oral and a written component and is conducted in the final weeks of the tutorial class. As a part of the tutorial students also assemble a portfolio of all of the major papers and projects that they have completed during the program and a written reflection on that work. Prerequisite courses: GMCS 591 and completion of at least 21 semester hours of the

GMCS program.

3 semester hours

GLOBAL MEDIA AND COMMUNICATION STUDIES 599

Thesis

The thesis represents the culmination of the MA in Global Media and Communication Studies and demonstrates competency in the major as well as the track in which the student has chosen to specialize. The Thesis requires identifying a theme or topic selected by the student in consultation with the thesis adviser and this is followed by detailed research on the topic and the analysis of findings in the form of substantial written work. This is normally done within the confines of the student's final semester of study in the program.

3 semester hours

Health Sciences

HSCI 710

Introduction to the U.S. Health Care System (Core course)

This course is a broad survey of the various components of the U.S. health system, emphasizing the historical development of the various institutions which make up the system, and financial analysis of those institutions as they currently exist. This class will not address health care systems of countries outside the U.S. This course will include the status and implementation of the new reform legislation at the state and federal levels and to the budgetary implications of health care spending more broadly. There will also be a focus on the major health policy institutions and important issues that cut across institutions, including private insurers and the federal/state financing programs (Medicare and Medicaid/SCHIP). Attention also will be given to mental health issues, disparities in access to care, the quality of care, structure of the delivery system, the challenges of long-term care and the aging of the population, and the drivers of cost growth.

3 Credits

HSCI 715

Research Methods for the Health Sciences (Core course)

A comprehensive exploration of research methods used in the health sciences, with an emphasis on selecting and applying appropriate research designs. This course includes an overview of the scientific method and the various research paradigms in current use; research ethics and the protection of human subjects; the role of theory in problem formulation; internal and external validity;

Health Sciences

variable measurement and reliability, and generalizability of findings. Specific approaches covered include experimental and quasi-experimental treatment designs, epidemiologic methods (cohort and case-control studies), survey research, evaluation and outcomes research, methodological studies and qualitative research.

3 Credits

HSCI 720

Global Health Issues (Core course)

This course examines contemporary issues in global health policy, delivery and discusses major global health challenges. Students will be introduced to the world's vast diversity of determinants of health and disease. Students will analyze current and emerging global health priorities, including emerging infectious diseases, poverty, conflicts and emergencies. The course will also review health inequity, health systems reforms, and major global initiatives for disease prevention and health promotion. The course will consider how inequalities in education, income, and occupation influence health status. The public policy process will be explored using a variety of contemporary global health case studies which focus on content areas such as maternal health, HIV policy, refugee health and global healthcare delivery. The course will also examine the global health workforce and the impact of widespread global migration of health professionals on receiving and sending countries.

3 Credits

HSCI 725

Fundamentals of Clinical Trials (Core course)

This course is designed to teach the fundamentals of a good clinical trial in the evaluation of a new drug or device, be it industry, federal or philanthropic sponsored. This course begins with the evaluation process leading up to human volunteer trials, through elements in designing a trial, writing the scientific protocol, considering regulatory issues and human subjects' protection, through elements in protocol development/implementation, and quality assurance.

3 Credits

HSCI 730

Healthcare Informatics (Core course)

This course is designed to explore the healthcare information technology (IT) planning and management issues associated with decision making in healthcare organizations. IT provides a framework to understand the types of information systems prevalent in healthcare organizations, evaluate specific strate-

gies related to healthcare IT investments, and understand the ramifications of health data standards and privacy concerns on information management policy. In this course, students will learn how the core competencies of healthcare informatics can be developed and applied using real-world case studies. Students will be exposed to specific concepts related to electronic medical records (EMR), health data and standards, sourcing, and IT investments in healthcare. Upon completion of the course, students should be able to explain the key information requirements for effective health information management and decision support, plan and develop the governance and oversight requirements of healthcare IT projects, understand the specification and selection process of healthcare projects, and apply these competencies to real-world problems.

3 Credits

HSCI 735

Data Analysis and Interpretation (Core course)

This course covers the selection, application and interpretation of basic statistical tests and procedures used in the health sciences. Topics include data and variables, hypothesis testing, confidence intervals, t test, Fischer's F test and the one way Analysis of Variance (ANOVA)

3 Credits

HSCI 840

Advanced Disease Processes and Treatment (Clinical concentration)

This is an advanced course providing detailed information about systems physiology and pathophysiology, as well as the epidemiology, etiology, risk factors, pathogenesis, prognosis and treatment of disease, particularly pharmacotherapeutics. Topics covered include cardiopulmonary diseases, infectious diseases, gastroenterology, urology, endocrine and oncology. Lab and specific diagnostic tests will be reviewed. Cultural and ethnic approaches to health care and prescription drug use will also be explored. Special attention will be placed on recognizing drug-drug, drug-nutrient, and drug-exercise interactions.

3 Credits

HSCI 845

Lifestyle and Health Issues (Clinical concentration)

Crucial health issues with an emphasis on the relationship between lifestyle and health. The course enables students to deal more effectively with the health problems faced throughout life. These issues may include stress, sexuality, nutrition, mental health and illness, aging, chronic and communicable disease, drug and

alcohol use, and dealing with death, and other selected topics.

3 Credits

HSCI 850

Health Promotion and Disease Prevention (Clinical concentration)

This course provides an overview of the major issues in health promotion and disease prevention. This course will explore the possible association between nutritional status and premature mortality and morbidity. Strategies for risk reduction and the development and implementation of interventions will be presented. Emphasis will be placed on understanding the role nutrition plays not only in health but also in disease prevention.

3 Credits

HSCI 855

Integrative and Complementary Medicine (Clinical concentration)

This course will provide students with a working knowledge about integrative and complementary medicine and clinical applications for patient/client care and research. Federal regulations, cultural beliefs, scientific research and perceived benefits and risks will be explored. The appropriateness of integrating these therapeutic modalities into conventional medicine will also be explored.

3 Credits

HSCI 848

Teaching in the Health Professions (Education concentration)

This course provides an analytic and developmental approach to the roles and functions of the health professional teacher. Discussions will focus on teaching roles, style and philosophy and the application of learning theory to instructional design and lesson planning. Emphasis will be on selection and application of appropriate teaching strategies and assessment methods according to the goal(s) of instruction and identified learner characteristics. Other issues that will be addressed are student problem management, key ethical and legal responsibilities, and the incorporation of research evidence into teaching practice.

3 Credits

HSCI 849

Educational Assessment (Education concentration)

This course reviews the types, purposes, procedures, uses, and limitations of assessment strategies and techniques. The use of standardized testing and implications for current practice is also discussed. Topics such as creating and using assessment tools that improve

instruction (formative assessments) as well as gauge its success (summative assessments) will be reviewed. Learning to design assessments that are carefully aligned with educational objectives is another component of this assessment course. This course will explore aspects of developing objective and subjective exams. Another topic involves the methods of developing and revising assessment tools such as rubrics, checklists, and scoring guides.

3 Credits

HSCI 851

Advanced Clinical Nutrition Assessment, Intervention and Application I

Integrative nutrition and functional medicine in Metabolic Health Issues and Cardio Vascular Health (Metabolic Syndrome, Obesity, Weight Loss Resistance, Diabetes Mellitus, Diabetes, Non – Alcoholic Fatty Liver Disease, Liver Disease, Hypertension, CVD, CHD, Arrhythmia, Vascular Health, Hyperlipidemia, Gastric Bypass Surgery, Hypothyroidism, Hashimoto's Thyroiditis, Graves' Disease and other Endocrine Disorders).

Critical assessment and evaluation of current Evidence Based Nutrition (EBN) and other interventions: Low Glycemic Index and Glycemic Load Diets, DASH Diet, Vegetarian Diet, Ketogenic Diet, Fruitarian, Paleo Diet, Whole 30 Diet, Elimination Diets, IFM Intermittent Fasting and Mitochondrial Diet, IFM Cardio-metabolic Diet, and all weight loss and FAD diets as they pertain to Metabolic Health Issues and the potential dangers of them. Supplementation EBN evaluation, assessment and dosing for condition specific application.

3 Credits

HSCI 852

Advanced Clinical Nutrition Assessment, Intervention and Application II

Integrative nutrition and functional medicine in Digestive Health Issues (Reflux Disorder (GERD), Ulcerative Colitis, Constipation, Diarrhea, Crohn's Disease, Celiac Disease, Non-Celiac Gluten Sensitivity, Dysbiosis – Intestinal Permeability, Diverticulitis, Irritable Bowel Syndrome, Hemorrhoids, Gallbladder, Pancreatitis, Detoxification, Food Allergies and Sensitivities, Small Intestinal Bowel Overgrowth, Small Intestinal Fungal Overgrowth, Fibromyalgia, Chronic Fatigue Syndrome, Anemias).

Critical assessment and evaluation of current Evidence Based Nutrition (EBN) and other interventions: Gluten Free Diets, Casein Free Diets, Elimination Diets, Autoimmune Paleo Diet, FODMAPs, Specific Carbohydrate Diet, Mono Dieting, Liquid Fasting, IFM Elimination Diet, Anti – Candida Diet, GAPS Diet and others.

Supplementation EBN evaluation, assessment and dosing for condition specific application.

3 Credits

HSCI 858

Curriculum and Syllabus Development in Higher Education (Education concentration)

This course will explore the various types of curricula that exist within organizations as well as goals and philosophical orientations to education. The course is designed to provide students with the knowledge and skills to fulfill leadership positions as enlightened educators. Students will gain a broad understanding of the curriculum development process. Topics will include translation of societal and community expectations into theoretical curricular frameworks for application to problem solving and initiatives for change. Discussions will revolve around what knowledge is most worth learning, why it is worthwhile, and how it will be delivered. Topics will include the effect of internal and external forces on the curriculum. The course will also cover creation of syllabi with a description of the required components.

3 Credits

HSCI 859

Pedagogy and Teaching Strategies for College Instructors (Education concentration)

This course describes the theoretical basis of pedagogy and explores the foundations of teaching in higher education. Issues such as: how students learn, motivating students, and matching teaching methods with learning outcomes are topics designed to improve the quality of higher education. This course not only covers how to connect with students in the learning process, but also how to determine if students are learning. Using active techniques, encouraging classroom participation, motivating students, and various learning styles are examples of topics that will be covered. This course provides practical suggestions to implement the methods discussed.

3 Credits

HSCI 860

Evidence-Based Practice (EBP) (Elective)

This course introduces practitioners to principles of evidence-based practice (EBP), policy, practice guidelines, and information utilization for practice modeling. Increasingly, health care practitioners are presented with new information about recent findings from research and professional consensus statements regarding best-practices and practice guidelines. This course focuses on preparing students to engage in evidence-based practice, providing the skills needed to critically evaluate new infor-

mation that is available from research findings and professional consensus statements. Furthermore, the course provides skills for integrating this new information into the students own, personalized approach to practice.

3 Credits

HSCI 865

Principles of Health Policy and Management (Elective)

This course discusses the general principles of planning, management, evaluation, and behavior of public and private health care organizations at the local, state and national levels. The course examines the organization, financing, and delivery of public health and personal health services, with emphasis on major current health policy and management issues related to access, quality and cost.

3 Credits

HSCI 870

Principles of Environmental Toxicology (Elective)

Environmental toxicology is the study of the nature, properties, effects and detection of toxic substances in the environment and in any environmentally exposed species, including humans. This course will provide a general understanding of toxicology related to the environment. Fundamental toxicological concepts will be covered including dose response relationships, absorption of toxicants, distribution and storage of toxicants, biotransformation and elimination of toxicants, target organ toxicity and teratogenesis, mutagenesis, carcinogenesis and risk assessment. The course will include an overview of chemodynamics of contaminants in the environment including fate and transport. The course will examine chemicals of environmental interest and how they are tested and regulated.

3 Credits

HSCI 875

Infectious Diseases (Elective)

This course provides a detailed examination of emerging and reemerging infectious disease, focusing on significant illnesses found in various regions of the world. Topics include information on the underlying mechanisms of microbial emergence, the technology used to detect them, and the strategies available to contain them. Discussion will involve diseases and their causative agents that are major factors in the health of populations the world over. This course will provide a clear understanding of factors associated with disease emergence and re-emergence can help medical and public health professionals to identify, study, and control new and renewed epidemics and out-

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breaks. Epidemiological characteristics such as incubation period, infectious period, and means of transmission, the immune response, treatment, prevention and surveillance of these infectious diseases will be evaluated. Up-to-date selections from infectious disease journals as well as information from the Centers for Disease Control and Prevention, the World Health Organization, MedLine Plus, and the American Society for Microbiology will be included to insure that topics are kept current.

3 Credits

HSCI 888

Medical Toxicology (Elective)

This course covers the adverse health effects of exposure to drugs or substances of abuse. The principles of toxicodynamics, toxicokinetics, biotransformation, diagnosis and treatment will be discussed. Emphasis will be placed on mechanism(s) of action of the various drug classes, body system(s) affected, clinical manifestations of problems and the resulting adverse effects on human health and society. Methods of treatment and client education will also be addressed. Laws controlling and governing the use of these drugs/substances and the agencies responsible for them will also be covered.

3 Credits

HSCI 889

Comparative Health Systems (Elective)

This course examines health systems from a comparative perspective in order to understand how various countries address similar problems. This course begins by discussing global health themes, including: international health organizations, right to health, access to medicines, significant international health issues, women's health, children's health, and the environment and health. The course includes a discussion of the different approaches and methods used in comparative health care systems and examine some of the key concepts that will allow for meaningful policy comparisons across countries. The course explores what healthcare systems do and how they have evolved. Different frameworks for healthcare delivery, financing, coverage, and allocation of resources are examined. Students will learn to analyze the advantages and disadvantages of various ways of organizing and financing health care and to evaluate health policies according to a range of criteria for cost, quality and equity. The focus will be on select health care systems around the globe and review the structure and functioning of their health systems.

3 Credits

HSCI 890

Dissertation Seminar (Required)

This course is designed as a general seminar for all doctoral students in the D.H.Sc. Program. This seminar does not focus on a specific content area but instead is designed to provide students with an overview of the requirements for completing a doctoral dissertation, and provide a forum for discussing dissertation-related concerns and issues with other students. In particular, the seminar emphasizes the development of the conceptual and research skills necessary for the completion of the doctoral dissertation, including the formulation of the dissertation proposal (selection of an area and topic, formulation of appropriate research questions/hypotheses, rationales etc.), the development of the skills necessary for identifying and critically evaluating published research relevant to the chosen dissertation topic, as well as an appropriate research methodology for empirically evaluating the hypotheses proposed. Designed in a seminar format, this course guides students through the formative stages of proposal development in which constant, critical thinking is required. Interaction among the instructor and students is important to transform ideas into a doctoral dissertation project.

3 Credits

HSCI 891

Dissertation I (Required)

This course is designed to synthesize the knowledge and skills developed in previous research courses and apply them to the doctoral dissertation process. Students learn about all aspects of the process of developing and carrying out the doctoral dissertation, and they gain an understanding of standards and expectations that students need to meet to be successful in completing the dissertation process. Throughout the course, students are required to work closely with their dissertation advisor, as appropriate. Student performance in the course will be assessed by their advisor. To make substantial progress, it is essential that students set and meet goals and have regular contact with their advisor to ensure the dissertation is progressing in a focused and high quality manner. Students will also prepare a dissertation proposal presentation. The course concludes with scholarly discussions and critique of peer presentations.

3 Credits

HSCI 892

Dissertation II (Required)

This course focuses on the completion of the doctoral dissertation. Emphasis is placed on

understanding and defining the logical relations between elements in a proposal including the problem statement, conceptual/theoretical framework, literature review, research design and methodology. Students will work closely with their advisor throughout this process.

3 Credits

HSCI 895

On Campus Seminar (Required)

An intensive one week on campus seminar is the culmination of the Doctor of Health Sciences degree program. This seminar will provide students with a unique on-campus learning experience. Health care professionals who are established and leaders in their fields will be recruited as guest lecturers. In addition to the lectures, students will have the opportunity to hone their skills by attending workshops led by experienced clinicians. Topics such as improving patient care and interviewing techniques will be featured. Finally, students will be required to present their dissertations and submit a report of their experiences at the seminar.

4 Credits

Information Systems and Knowledge Management

INFORMATION SYSTEMS AND
KNOWLEDGE MANAGEMENT 400

Information Systems and Technology

Information technology has become a key component for accomplishing strategic and operational goals in organizations today. As such, organizations expect their new employees to have a basic understanding of information technologies. To accomplish organizational goals and advance one's career path, one needs to understand and apply information technologies effectively, efficiently, and creatively. The purpose of this course is to provide an introduction to information systems and technology and to familiarize students with the fundamental concepts and principles of information systems. The course is targeted for graduate students who have little or no background in information systems. Therefore, it focuses on breadth of coverage rather than depth in any specific area. Prerequisites: Admission to graduate study.

3 semester credits

INFORMATION SYSTEMS AND
KNOWLEDGE MANAGEMENT 505

Knowledge Management and Business Intelligence

This course will explore various issues of creating, storing, sharing and applying knowl-

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edge in organizational environment. The course introduces guiding theories and concepts of knowledge management and examines various tools used in the processes. Then the course also explores business and management topics in knowledge management, including general issues in evaluating informal systems like knowledge management systems and the relationship of knowledge management to the work, etc. Prerequisites: ITKM 505 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

INFORMATION SYSTEMS AND
KNOWLEDGE MANAGEMENT 548

Enterprise Intelligence & Decision Support System

If information is business' lifeblood then enterprise intelligence (referred to as "business intelligence" and "BI" for the remainder of this document) is its beating heart, ensuring actionable information reaches everyone who needs it throughout the enterprise. With business analytics, big data and cloud BI exploding in the marketplace professionals should understand BI to help their enterprises harness the power of their data. This course provides that understanding. Additional topics and cases are added to compliment the text, written for managers grappling with how to leverage their enterprise data for positive results.

3 semester credits

INFORMATION SYSTEMS AND
KNOWLEDGE MANAGEMENT 549

Technical Concepts for Analytics Professionals

Success requires knowledge of your functional area and mastery of the data that fuels it. This course provides the technical understanding and critical thinking skills needed to adopt, learn and apply relevant tools and techniques to analyze data with confidence. Students will gain hands on experience with structured query language (SQL) and R, from an applied perspective. In addition, they will be exposed to database, programming, analytics and statistical concepts. They will emerge ready to engage in additional study or to secure jobs in the marketplace that require these skills.

3 semester credits

INFORMATION SYSTEMS AND
KNOWLEDGE MANAGEMENT 500

Information Technology & Quantitative Methods

Data preparation and cleaning, data analysis, and data visualization are now at the heart of managerial decision making. This course will illustrate both IT and Quantitative Methods through three fairly involved examples and extensive hands-on experience. Cleaning data will lead us to database principles that under-

lie data independence and referential integrity. Summarizing a modest-sized dataset (about 8,000 rows) will introduce statistical summaries, some basic visualization tools, and the statistics behind correlation coefficients and matrices. Pivot Tables and various visualization techniques will allow us to answer the question, "What is the data telling us?" The final project allow us to apply results from calculus to generate forecasts which we will then visually and statistically compare by using 3-D graphics and hypothesis testing. We will use the computer for the entire course; nothing is done by hand.

3 semester credits

INFORMATION SYSTEMS AND
KNOWLEDGE MANAGEMENT 560

Foundations in Advanced Enterprise Analytics

This course introduces the student to advanced business analytics. The course covers how to manage business analytics studies, exploratory data analysis, diverse modelling algorithms, and forward-looking reporting techniques. It is assumed that the student is comfortable with programming, and can learn and use new programming languages.

3 semester credits

Management

MANAGEMENT 400

Leadership and Management

The purpose of this course is to introduce students to the primary tenets of leadership and management. Successful organizations foster both innovation and efficiency. Students will evaluate the different dynamics related to realizing organizational progress through the effective and efficient use of talent, structure, culture, methods, and technology. In addition to the required textbooks, students will be required to research industry journals as a way to evaluate the application of leadership and management techniques in real settings across various industries. Prerequisites: Admission to graduate study.

3 semester credits

MANAGEMENT 500

Management & Marketing

This course serves as a graduate introduction to the theory and practice of both management and marketing, two separate, yet related, fields of business study. The management portion of the course will address the four key tenets of management: planning, organizing, leading and controlling. The marketing portion of the course will address creating, delivering, and communicating value by building customer

relationships via the marketing mix: product, price, place (distribution), and promotion. Both parts of the course will examine the effects of globalization, technology, and social responsibility. In addition to textbooks and other readings, the course will use individual and group projects to develop real-world solutions to challenges posed in these two disciplines.

3 semester credits

MANAGEMENT 505

Organizational Behavior

This course permits students to examine both theory and practice of interpersonal, team and organizational behavior. Individual and small group projects develop and illustrate principles of relationships, communications, role assignment, leadership and conflict management in organizations. Experiential designs permit learning through group participation, case analysis and individual problem solving. Prerequisites: MGMT 400 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

MANAGEMENT 510

Managerial Economics

3 semester credits

MANAGEMENT 511

Human Resources Management

This course is an in-depth survey of current theory, research and practice in the management of human resources in organizations. Job design, recruitment, selection, performance feedback, goal-setting, training, employee rights, safety, compensation and benefits issues are reviewed within the context of their application in the United States as a world standard for such practices, with comparisons to customs and practices in the international arena. Intensive research into current human resource topics is required. Prerequisites: MGMT 400, MGMT 505 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

MANAGEMENT 512

Organizational Development

The course is a hands-on course that provides the concepts and practical tools needed to start a small business. The course offers instruction in accounting concepts specific to small businesses experience with accounting software. Understanding of financing opportunities including bank loans and venture capital will enable the student to obtain financing for a small business. Students will also study basic financial management principles relevant to small business. The course also focuses on setting up

Management

the legal structure for the business by enabling the student to choose the appropriate organizational form and to study the regulatory and employment laws specific to small businesses. Prerequisites: MGMT 505 and completion of all required Management Major courses or concurrent registration in final required major courses.
3 semester credits

MANAGEMENT 515

Assessment

This course focuses on workplace assessment related to recruitment, placement, and workplace training. Performance appraisal is emphasized including employee development, development of objectives and process, monitoring, retention and separation. The understanding of selection and assessment instruments and methodology are studied as well as the statistical analysis required for psychometric assessment. Prerequisites: MGMT 400, MGMT 505 and completion of all core courses or concurrent registration in final core courses. Normally students take MGMT 511 before MGMT 512.

3 semester credits

MANAGEMENT 520

Fundamentals of Entrepreneurship

This course will begin by addressing the concept of development of a new venture. The course will then address the fundamentals such as the financing important to the new venture and its creator, competitive positioning, branding and imaging, stationery, marketing, protecting intellectual property, the legal entity structure, the website development components and cost. The class will teach how to source capital and then further how to pitch to capital providers. Each student will develop a minimum viable product by producing a business model canvas to further in a business plan in a later class.

3 semester credits

MANAGEMENT 525

Counseling

The course surveys counseling theory, counseling strategies, and appraisal procedures. The purpose is to enable the human resources manager to identify potential employee problems such as addiction, mid-life issues, and psychological disorders. This training will facilitate the ability of the manager to refer employees for professional counseling and intervention. There will also be emphasis on resolving workplace interpersonal conflicts. Prerequisite: MGMT 505 and completion of all required Human Resources Management Major courses or concurrent registration in final

required major courses.

3 semester credits

MANAGEMENT 522

Conflict & Negotiation

The development of conflict-management and negotiating skills are taught in this course with particular emphasis on achieving effective and efficient outcomes within a global and multicultural context. Experiential exercises, readings and discussions will demonstrate various strategies for a broad range of negotiating scenarios, e.g., buyer-seller, management-labor, personal salary increase, etc. Prerequisites for Management Major or Human Resources Management Major: MGMT 400 and MKTG 400 and completion of all required major courses or concurrent registration in final required Major courses.

Course is cross-listed with MKTG 522.

3 semester credits

MANAGEMENT 523

Leadership, Teams and Managing Change

This course focuses on the development of leadership skills important in the effective management of change. Through role-playing exercises, videotapes, diagnostic tools, seminar discussion, selected readings, and a group project, students will learn theory and build interpersonal skills necessary for providing leadership in diverse multicultural groups and organizations. The course will address the managerial issues present in organizations undergoing accelerating change and adopting a culture of creativity. Creating and sustaining high performance multi-cultural and interdisciplinary traditional and virtual teams is covered. Prerequisites for Management Major or Human Resources Management Major: MGMT 505 and completion of all required major courses or concurrent registration in final required major courses.

3 semester credits

MANAGEMENT 534

Strategic Sourcing and Vendor Management

This course examines the somewhat recent economic evolution from a primarily manufacturing model to a more information driven economy with an emphasis on the impact of these changes on professional careers. Students will review and assess the primary attributes of IT, such as data management and software as a way to evaluate the potential role of technology in administering professional activities. In the final module, students will develop a personal strategy by reflecting on their individual attributes as a way to further develop their unique talents in the work-

place. Prerequisites for Management Major and Operations Major: MGMT 505, MGMT 560 and completion of required major courses or concurrent registration in final major required courses. Students may take MGMT 734 or MGMT 540 but not both.

3 semester credits

MANAGEMENT 539

International Issues

This course focuses on current international issues that affect business operations at home and abroad. Changing business environments are discussed and analyzed. Students are required to formulate new global business strategies in light of emerging international trends and events. In some cases, students may supplement their study by field trips and on-site analysis.

3 semester hours

MANAGEMENT 548

Business Intelligence & Decision Support Systems

MANAGEMENT 545

Labor & Employment Law

Students study the current employment and labor law in the U.S. and the historical development of these laws from common law to existing law. The course covers a wide range of legal and regulatory topics needed for human resources management including workplace safety, family leave, equal employment and pay, wrongful discharge, privacy, harassment, and illegal workers. In addition, development of global laws and laws related to employment and labor in other countries are reviewed. Prerequisites: MGMT 400, BLAW 400 and completion of all core courses or concurrent registration in final core courses. Normally students take MGMT 511 before or concurrent with BLAW 545.

3 semester credits

MANAGEMENT 555

Global Program and Project Management

This course focuses on the managerial aspects of how to effectively manage, plan and execute programs/projects with a focus on high quality deliverables arriving on time, within budget, within scope and to the customer's satisfaction. Areas covered will include program and project management life cycle phases, executive sponsorship, portfolio investment management selection and prioritization, requirements, scope and project charters, planning, development, estimating, staffing, leadership, scheduling, risk management, change management, project metrics, vendor integration and management and other related

Management • Marketing

topics. This course is based on current and emerging best practices and principles. Project Management certification requirements and real world case studies are discussed. Prerequisites: MGMT 400, MGMT 505 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

MANAGEMENT 560

Foundations of Business Process and Operations Management

The student is introduced to process management methods which are fundamental to delivery of products and services. Topics covered include capacity analysis and planning, inventory management, design of jobs for quality and cost effectiveness, demand forecasting, work flow management, queuing theory, project management and total quality management. Prerequisites for Operations Major: MGMT 400 and completion of all core courses or concurrent registration in final core courses. Prerequisites for Management Major and Human Resources Management Major: MGMT 400 and completion of required major courses or concurrent registration in final required major courses.

3 semester credits

MANAGEMENT 565

Foundations of Product Management

This course focuses on the development of the entrepreneurial spirit and develops specific skills to fulfill plans that develop from that creative and persevering spirit. Many different aspects of entrepreneurial ability will be emphasized including a strong work ethic, leadership, team building and the development of business relationships. The course also covers the growth of an existing business through entrepreneurship. Students will conceive, develop and present a comprehensive business plan intended to obtain external financial support or internal organizational support. Prerequisites for Small Business and Entrepreneurship Major: MGMT 400 and completion of all core courses or concurrent registration in final core courses. Prerequisites for Management Major: MGMT 400 and completion of required Management Major courses or concurrent registration in final required Major courses.

3 semester credits

MANAGEMENT 568

Technical Concepts for Analytics

3 semester credits

MANAGEMENT 582

Small Business and Entrepreneurship

This course focuses on the development of

the entrepreneurial spirit and develops specific skills to fulfill plans that develop from that creative and persevering spirit. Many different aspects of entrepreneurial ability will be emphasized including a strong work ethic, leadership, team building and the development of business relationships. The course also covers the growth of an existing business through entrepreneurship. Students will conceive, develop and present a comprehensive business plan intended to obtain external financial support or internal organizational support. Prerequisite: MGMT 560. This course is intended for students in their next to last semester of study.

3 semester credits

MANAGEMENT 585

New Product Commercialization

The objectives of the course are to understand and apply concepts and techniques of product Commercialization. The course focuses on taking student created product concepts and having student teams drive the concepts to become actual products. Product design, prototype creation, market analysis, and financial analysis all come together within the student team to create a viable product. If ideas are worthy, teams may work with the University's CTech IncUBator to actually commercialize their products. Students are strongly encouraged to find a sponsor to actually commercialize their product ideas. Prerequisite: MBA students must have completed all foundation level courses and have advisor approval.

3 semester credits

MANAGEMENT 595

Management Independent Study

1-6 semester credits

MANAGEMENT 599

Internship

3 semester credits

Marketing

MARKETING 400

Marketing

The course will explore the process of planning and executing the conception, pricing, promotion and distribution of ideas, goods and services, to create exchanges that satisfy individual, organizational, and societal objectives. The underpinnings of the marketing discipline will be taught through text, case, articles and class discussion. Mastery of these principles will come through a variety of individual and group assignments to create marketing solutions for real-world products. Pre-

requisite: Admission to graduate study.

3 semester credits

MARKETING 515

Customer Analysis

This course will take up special topics in customer behavior utilizing knowledge not only from research on consumer behavior but from a variety of disciplines including psychology, sociology and anthropology. The leading models of customer behavior in both industrial and consumer settings will be analyzed. The qualitative and quantitative marketing research tools necessary to understand buyer behavior dynamics in any market will be stressed. Prerequisite: MKTG 400 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

MARKETING 560

Global Market Management

This course analyzes strategy, planning, implementation and control for market entry and development. Topics include social, political and economic changes affecting marketing opportunity; focused versus dispersed marketing efforts; marketing in developed and undeveloped countries; and marketing systems required for the various strategic alternatives. The focus will be on creating competitive advantage in the global marketing environment. Prerequisite for Marketing Major: MKTG 400, MKTG 515 and completion of all required Marketing Major courses or concurrent registration in final required Major courses. Prerequisite for International Business Major: MKTG 400 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

MARKETING 505

Marketing Research

This course introduces students to the essentials of marketing and brand management at the graduate level. Students will learn concepts and frameworks from the marketing and branding literatures, such as the definition of marketing and the concept of Customer-Based Brand Equity (CBBE).

3 semester credits

MARKETING 535

Electronic and Mobile Business

The goal of this course is to prepare current and future executives, managers, and strategists to be leaders and create value in the New Economy – to gain understanding and insight on how the functions of management and marketing in the New Economy have changed as well as how new technology and media

forms have created a radically different business environment. The course examines the impact of the evolving virtual worlds of Internet and mobile commerce on the strategy of traditional “brick-and-mortar” companies. Up-to-date information will be utilized from current publications to provide the student with the ability to work in the new wireless world. This new business frontier requires most firms to significantly change their business strategy and presents unprecedented new opportunities for fast acting entrepreneurs. Prerequisites for Information Technology and Knowledge Management: MKTG 400, ITKM 400, and completion of all required Information Technology and Knowledge Management Major courses or concurrent registration in final required Major courses. Prerequisites for Marketing: MKTG 400, ITKM 400, and completion of all required Marketing Major courses or concurrent registration in final required Major courses. Course is cross-listed with ITKM 535.

3 semester credits

MARKETING 520

Customer Relationship Management

This course emphasizes the long term organizational value of developing relationships with customers. The first focus is on the use of data to provide increased value for the firm. Students will understand how to create value for the customer with a systematic analysis of customer needs. The second focus on the nature of interpersonal relationships in a business setting that develops long lasting business relationships. Prerequisite: MKTG 515 and completion of all required Marketing Major courses or concurrent registration in final required Major courses.

3 semester credits

MARKETING 540

Personal Sales and Sales Management

The purpose of this course is to develop the student's ability to engage in real world professional sales and sales management. The foundation of personal sales is to be able to communicate effectively in both one-on-one sales situations and in group presentation situations. Psychological theory related to persuasion and interpersonal relationships will be used to provide the foundation for specific sales techniques. Practical experience in persuading, prospecting, negotiating, referrals, closing the transaction, and responding to buyer concerns will be utilized. The course will also focus on the management of a sales force including methods of compensation, motivation, hiring and retaining sales people, and the legal and ethical aspects of selling. Prerequisite: MKTG

515 and completion of all required Marketing Major courses or concurrent registration in final required Major courses.

3 semester credits

Mathematics

MATHEMATICS 401

Advanced Analysis for Scientists and Engineers I

Partial differential equations, Bessel functions, Legendre polynomials. Fourier series, boundary and initial value problems, topics in vector analysis, tensor analysis. Prerequisite: Math 301 (Differential Equations). One semester of advanced calculus strongly recommended.

3 semester hours

MATHEMATICS 402

Advanced Analysis for Scientists and Engineers II

Functions of a complex variable, conformal mapping, calculus of residues, operators. Prerequisite: Math 301 (Differential Equations). One semester of advanced calculus, or permission of the instructor.

3 semester hours

MATHEMATICS 403

Functions of a Complex Variable I

The general theory of functions of a complex variable. Complex algebra, analytic functions and their mappings, complex integration, infinite series, Taylor and Laurent expansion, isolated singularities, residue theory. Prerequisite: One year of advanced calculus.

3 semester hours

MATHEMATICS 404

Functions of a Complex Variable II

Continuation of Mathematics 403. Additional topics include insofar as time permits, harmonic functions, conformal mapping and applications, normal families. Riemann mapping theorem, analytic continuation, Riemann surfaces, infinite products, entire functions. Prerequisite: Math 403.

3 semester hours

MATHEMATICS 407

Introduction to Modern Analysis

Metric Spaces, sequences and series, continuity differentiation, Riemann-Stieltjes integral, functions of several variables.

3 semester hours

MATHEMATICS 411 & 412

Introduction to Applied Mathematics 1 & 2

Introduction to Hilbert Space, Fourier Series, calculus of variations, boundary value problems, Green's functions and integral equations.

3 semester hours

MATHEMATICS 414

Numerical Analysis

Interpolation, numerical differentiation and integration, numerical solution of differential equations, least squares, error analysis. Prerequisite: Math 215 (Calculus and Analytic Geometry III) or equivalent. Math 301 (Differential Equations) strongly recommended.

3 semester hours

MATHEMATICS 415

Advanced Numerical Analysis

Convergence, numerical stability, round off error, truncation error arising from the approximation of differential and integral equations.

3 semester hours

MATHEMATICS 423

Mathematical Statistics I

Probability theory, discrete and continuous distributions, transformations, moment generating functions, characteristic functions, central limit theorem, sampling distributions. Prerequisite: Math 215 (Calculus and Analytic Geometry III) or equivalent.

3 semester hours

MATHEMATICS 424

Mathematical Statistics II

Continuation of Mathematics 423. Additional topics include estimation, testing of hypothesis, confidence intervals, regression, and analysis of variance. Prerequisite: Math 423 or Math 323.

3 semester hours

MATHEMATICS 431

Introduction to Topology and its Application

Elements of point set theory; introduction to topological spaces including metric spaces; separation and countability axioms; connectedness; compactness; completeness. Prerequisite: One year of advanced calculus.

3 semester hours; offered as needed

MATHEMATICS 451

Linear Algebra and Matrix Theory I

Linear vector spaces, bases, dimension, inner product, norm, orthogonality. Linear transformations, matrices, matrix algebra, Hamilton-Cayley Theorem, eigenvalues and eigenvectors, rank. Prerequisite: Math 391 (Modern Algebra) or equivalent.

3 semester hours

MATHEMATICS 453

Modern Algebra I

Groups, rings, fields, ideals, polynomials. Prerequisite: Math 391 (Modern Algebra) or equivalent.

3 semester hours

Mathematics • Mechanical Engineering

MATHEMATICS 454

Modern Algebra II

Continuation of Math 453. Modules, field extensions, Galois theory, real fields, special topics. Prerequisite: Math 453.

3 semester hours

MATHEMATICS 480

Selected Topics in Mathematics

Current topics in applied mathematics topics will be selected from specific disciplines as a focus for intense study. Current topics in Physics, Chemistry, Biology and Computer Science will be offered on a semester basis. The course may be repeated as long as topical focus changes.

3 semester hours

Mechanical Engineering

MECHANICAL ENGINEERING 407

Modern Materials and Advanced Manufacturing Technologies

This course focuses on the study of modern industrial materials and the process of developing creative solutions through conceptual analysis and synthesis on different advanced and automated manufacturing processes. The course will help students to learn the emerging topics in the material and manufacturing industries. The topics cover the study on today's popular industrial materials, material selections and industrial applications, and their related manufacturing techniques in US industry. Topics also include the introduction of quality control (QC) process that is important to the production with the high quality. The course has two class projects which will guide and help students to learn the ways of preparing for professional research and keep track of the latest technologies in modern materials, advanced and automated manufacturing processes. Prerequisites: Engineering 111, Mechanical Engineering 223.

3 semester hours

MECHANICAL ENGINEERING 410

Advanced Fluid Dynamics

Advanced topics in applied fluid mechanics. Review of continuity, momentum, and energy equations for viscous, incompressible fluid; voracity and circulation concepts and theorems. Selected topics from the following areas: Complex potential, conformal mapping and applications. Airfoil and wing theory. Boundary layer theory; similarity solutions for laminar flows, integral techniques for turbulent flows. Compression and expansion waves in compressible flows; oblique shock waves,

Prandtl-Meyer flow. Propagating waves and applications; shock tube, transients in duct systems. Prerequisite: Undergraduate Fluid Mechanics, Mechanical Engineering 309.

3 semester hours

MECHANICAL ENGINEERING 415

Propulsion

The course instructs the student in aerospace propulsion systems including both air breathing and non-air breathing devices. The course reviews the basic physics, chemistry, thermodynamics and gas laws applicable to propulsion devices. Details of individual engine components such as diffusers, compressors, turbines, propellers, nozzles, and afterburners as well as all major engine types (turbofans, turboprops, turbojets, ramjet) are studied. Course projects include utilization of engine propulsion software and sizing an engine for an aircraft. Prerequisite: Mechanical Engineering 203, Mechanical Engineering 307.

3 semester hours

MECHANICAL ENGINEERING 421

Computer Aided Engineering Design

This course applies 3-D CAD system e.g., Pro E to industrial product and system design. These CAD systems are very practical and powerful 3-D CAD tools and they have been widely used in the industry. The first half of the class focuses on learning fundamentals of the 3-D system, its popular applications and its related techniques. The special topics of design concept are also included. The second half covers several practical projects. Students will combine the design techniques with the real project and use 3-D tools to design the product or part of industrial system. All projects will be presented by students in class. Prerequisites: Engineering 111, Physics 111, Mechanical Engineering 350D.

3 semester hours

MECHANICAL ENGINEERING 422

Advanced Computer Aided Project Design

This advanced course focuses on some hot and very practical topics in today's industrial design applications. Also, some useful knowledge, such as PLC (Program Logic Control), calculation and selection of industrial motors, fundamentals of automation, sensor technology, and selection of material on different industrial applications are included. Several more complicated projects in this class will help students learn how to manage the different engineering projects and understand all related design issues which will improve the future production and manufacturing process. Pro-E will be used as a 3-D CAD tool to de-

sign these advanced engineering projects. All projects should be presented by students in the class. Prerequisites: Mechanical Engineering 421.

3 semester hours

MECHANICAL ENGINEERING 423

Computer Aided Manufacturing (CAM) and NC Machining

This course applies manufacturing and various numerical controlled software for designing computer-aided manufacturing and NC machining systems, processes and algorithms. This course is heavy in implementation of various manufacturing technologies and programming of NC machines. Prerequisites: Engineering 111, Physics 111, Mechanical Engineering 421.

3 semester hours

MECHANICAL ENGINEERING 424

Advanced CAM & Automation.

This course teaches students to simulate advanced manufacturing processes by learning high level functions in Pro-Engineer/Pro-Manufacturing software package. This course will cover the topics of some advanced and special manufacturing technologies, including laser cutting & welding, water jet cutting & cleaning, and plasma cutting & welding. Automation related topics will also be introduced, including the analysis and application of PLC control systems in manufacturing facilities and modern production systems. Several advanced and real projects will help students to be proficient in using this CAD/CAM package and learn more of US industrial & engineering knowledge through the instructor's lectures & guidance and also the students' self-motivated work. Prerequisites: Mechanical Engineering 350D, Pre-requisites: Mechanical Engineering 372.

3 semester hours

MECHANICAL ENGINEERING 425

Machinery and Mechanical System Design

This course focuses on the process of developing creative solutions through conceptual analysis and synthesis on machinery and biomedical instrument design and development processes. The topics cover the concepts of automated and high speed machinery design, basic biomedical instrument design, FDA regulation in biomedical instrument design, basic instrument mechanism design in assisting manufacturing processes, and other biomedical design techniques in today's US biomedical industries. Pro/Engineer will be used as the computer-aided design CAD tool to design the high function machinery and biomedical instrument in this class. Prerequisites: Mechani-

Mechanical Engineering

cal Engineering 350D.
3 semester hours

MECHANICAL ENGINEERING 426

Material Selection for Mechanical Engineers

This course provides students a systematic approach to the selection of materials and processes at various design stages for mechanical engineering applications. The concept of materials performance indices and materials selection charts are introduced with the detailed background of material properties, processing, and mechanics. Structured case studies are shown to use this methodology to select materials for numerous mechanical designs. CES Edu Pack will be introduced as a materials and processes database and a tool for students to compare, analyze and select materials and processes. Pre-requisites: Mechanical Engineering 223, 310, 372.

3 semester hours

MECHANICAL ENGINEERING 429 (MEEG 429/ELEG 429)

Electronics Cooling

This course is designed to help students understand the thermal challenges and demands of the electronics field. Fundamentals and physics of thermodynamics, heat transfer and fluid mechanics will be introduced and shown how to apply them to the design and testing of electronic hardware. The thermal characteristics and thermal failure modes of electronic components, and reliability prediction techniques will be reviewed. Numerical simulation and commercial CFD packages will be introduced for thermal analysis. Students will have a good understanding of the heat transfer and fluid mechanics principles affecting proper thermal management of electronic components and develop skills to identify potential thermal design problems and develop reliable, cost-effective solutions. Pre-requisites: Mechanical Engineering 310, Mechanical Engineering 363.

3 semester hours

MECHANICAL ENGINEERING 430

Design & Innovation

The objective of this course is to convey a sense of Design and Innovation in the development of products. To accomplish this the class shall review a number of case studies and participate in the design of a project. In addition to the semester project we shall discuss a number of topics of concern to Design and Engineering through illustrated talks (slides/tapes) and when available with guest designers and engineers. Pre-requisites: Engineering 111, Engineering 300.

3 semester hours

MECHANICAL ENGINEERING 440

Ergonomic Factors in Design

This course introduces the student to the concepts of ergonomics. Ergonomics is the study of fitting the workplace and devises to the capabilities of the human worker. Students will have an understanding of the beginnings and evolution of the field of ergonomics. They will learn to recognize risk factors associated with repetitive stress disorders (e.g., carpal tunnel syndrome) and potential sprain/strain injuries as well as be familiar with the body areas affected. This course covers principles of physiology and biomechanics and how they apply to workstation and tool design. Pre-requisites: Engineering 111.

3 semester hours

MECHANICAL ENGINEERING 441

Heating, Ventilating and Air-Conditioning System Design

This course focuses on HVAC systems design. Coverage of HVAC systems includes system type and selection, design, components, materials, installation, and commissioning. Pre-requisites: Mechanical Engineering 307, Mechanical Engineering 363.

3 semester hours

MECHANICAL ENGINEERING 451

Advanced Strength Analysis

This course is designed to give students an advanced understanding of mechanics of materials and their usage in design of mechanical structures and systems. Two-dimensional and three dimensional stress and strain, stress and strain relations, principal stresses; failure theories, factors of safety, stress concentration; beam theory, plate theory, column theory, thin-walled pressure vessels; energy methods, contact stresses, thermal strains, impact effects, fatigue and fracture, elastic stability. This course includes a design project. Pre-requisites: Mechanical Engineering 310.

3 semester hours

MECHANICAL ENGINEERING 452

Advanced Vibrations

Brief review of systems with one and two degrees of freedom. Rayleigh's method. Application of Lagrangian and matrix methods to discrete systems with many degrees of freedom; normal mode theory; vibrations of finite continua; solution methods and mathematical properties. Numerical and computer methods. Sensitivity analysis. Applications to machines and structures. Pre-requisites: Mechanical Engineering 315 or equivalent.

3 semester hours

MECHANICAL ENGINEERING 453

Finite Element Methods in Mechanical Engineering

Formulation of finite element characteristics using energy methods. Convergence criteria. Consistent load and mass matrices. In-plane and axisymmetric analysis using simple and higher-order triangular and quadrilateral elements. Finite element analysis of plate-bending problems. Isoparametric concepts and formulation; applications to two and three-dimensional stress analysis. Topics from the following areas will be chosen as time allows: buckling and vibration studies using discrete element techniques; finite element applications in fluid flow and heat transfer. Prerequisite: Mechanical Engineering 450 or permission of instructor. Pre-requisites: Basic Structural Mechanics, Math 214, Math 215, Engineering 111 or consent of instructor.

3 semester hours

MECHANICAL ENGINEERING 454

Advanced Dynamics

Orthogonal coordinate systems and their transformations. Particle kinematics in inertial and noninertial rotating coordinate systems. Dynamics of systems of particles and rigid bodies. Virtual work and generalized coordinates. Lagrange's equations and Hamilton's principle for holonomic and non-holonomic systems with applications. Lagrange multipliers. Prerequisites: Under-graduate Dynamics, Mathematics 301.

3 semester hours

MECHANICAL ENGINEERING 456

Mechanics of Composite Materials

Introduction to the mechanics of laminated filamentary composites. Prediction of stiffness and strength of laminated plates. Applications. Prerequisites: Undergraduate Strength of Materials, Mechanical Engineering 223.

3 semester hours

MECHANICAL ENGINEERING 458

Fatigue and Fracture Mechanics

Brittle fracture of structures, elastic stress analysis of cracked components, static and dynamic failures, plane stress and plane strain, elastic-plastic fracture mechanics, fatigue crack growth and life prediction under constant and variable amplitude loading, environmental effects. Term work is mainly design problems and is computer oriented. Pre-requisites: Undergraduate Strength of Materials, Mechanical Engineering 223.

3 semester hours

Mechanical Engineering

MECHANICAL ENGINEERING 462

Applied Thermodynamics

This course is designed to review the fundamentals of classical thermodynamics and apply them to the analysis and design optimization of power and refrigeration energy systems incorporating heat exchangers and combustion processes. The topics include: principles of thermal energy conversion; properties of pure substances and mixtures; first and second laws of thermodynamics; entropy; exergy; closed and open systems of various types; applications of the principles of thermodynamics to components and systems, including pumps, compressors, engines, turbines, power plants, renewable energy systems; power and refrigeration cycles. Prerequisite: Mechanical Engineering 203, Mechanical Engineering 307, Mechanical Engineering 363

3 semester hours

MECHANICAL ENGINEERING 463

Advanced Heat Transfer

Topics in conduction, convection and radiation heat transfer. Numerical methods, phase change, boundary layer principles, gas and solar radiation, combined heat and mass transfer. Prerequisite: Mathematics 301, Physics 209, Mechanical Engineering 208.

3 semester hours

MECHANICAL ENGINEERING 464

Advanced Heat Transfer

This course provides the examination of using renewable energy resources within thermal fluid systems. This class will explore principles and technical details of various thermal renewable energy technologies, such as solar heating & cooling, solar power plant, thermal energy storage, wind energy, geothermal. Prerequisite: Mechanical Engineering 203, Mechanical Engineering 307, Mechanical Engineering 363

3 semester hours

MECHANICAL ENGINEERING 470

Satellite Design and Technology

This course teaches the entire process of small satellite design, fabrication, integration and testing. The course covers the following topics: history of satellite design, satellite mission design; environment and hazards of space flight; orbits and astrodynamics (including spacecraft orbital elements and satellite tracking software); thermal control, materials and structures, power (including solar panels), propulsion, overview of payloads (communications and observation) data acquisition systems; ground station operation; NASA small satellite testing specifications and thermal, vacuum and vibration testing. Prerequisites:

Mechanical Engineering 252, Mechanical Engineering 307, Mechanical Engineering 363 or consent of instructor.

3 semester hours

MECHANICAL ENGINEERING 477

Additive Manufacturing

Additive manufacturing (AM) or 3D printing is a process of joining materials to make objects from 3D computer aided design (CAD) data. This course is designed to introduce students to the various AM processes, their theory and industrial practices, the latest developments and critical challenges in developing novel AM processes and applications. The expected outcome of this course is to train future engineers to innovate AM processes, select appropriate AM process for specific design-manufacturing applications. It includes a design project with 3D printing practices. Pre-requisites: Mechanical Engineering 223, Mechanical Engineering 350D.

3 semester hours

MECHANICAL ENGINEERING 479

CNC Machine Control and Milling

This course introduces the CNC milling machine to students. Included are machine and shop safety, CNC coding, material selection, machine maintenance, proper use of the coolant systems and tools. Routine machine procedures and implementation are covered in preparation for several machine operations to develop student skills.

3 semester hours

MECHANICAL ENGINEERING 490

Intellectual Property and Technology

This course is designed for graduate students who have an undergraduate degree in Engineering. Computer Science, Mathematics, Physics, Biology, Industrial Design, etc. Students need not have any familiarity with United States law but they must be prepared to read extensively under the instructor's guidance, statutes and cases decided by the Federal and State courts. Pre-requisites: Undergraduate degree in Engineering or Sciences.

3 semester hours

MECHANICAL ENGINEERING 500

Graduate Co-op/Internship in Mechanical Engineering

By arrangement.

1-3 semester hours

MECHANICAL ENGINEERING 505

Welding Engineering

Welding is the most common method of joining similar as well as dissimilar materials. It has been used in almost all manufactured

products in various sections of industries, such as pipelines, pressure vessels, aircraft, automobiles, microelectronic devices, medical devices, etc. Welding is a complex engineering discipline that involves processes, material science, design, inspection and quality assurance. This course is intended to provide knowledge of welding engineering and its application in developing and designing safe and durable welded structures. Major welding processes and their technical background will be introduced. This course also addresses design fundamentals applicable to welded structures and modeling and simulation of welding processes.

3 semester hours

MECHANICAL ENGINEERING 507

Management of Engineering Projects

The course focuses on the methods used to transform an engineering idea into practice. The course follows taking engineering design through the stages of systems engineering and new product development. Topics include project initiation, cost estimating and budgets, proposal writing, scheduling and planning, project tracking, construction, and startup. 3 credit hours. Prerequisite: graduate standing.

3 semester hours

MECHANICAL ENGINEERING 508(MEEG 508/BMEG 508)

Biomechanics

Biomechanics is the application of mechanical principles to living organisms that included bioengineering, research and analysis of mechanism in living organisms, and application of engineering principles to and from biological systems. This course can be carried forth on from the molecular level including collagen and elastin, all the way up to the tissue and organ level. Some simple applications of Newtonian mechanics can supply approximations on each level, but precise details demand the use of continuum mechanics.

3 semester hours

MECHANICAL ENGINEERING 510

Air and Space Vehicle Design

This course teaches the entire process of air flight vehicle and spacecraft conceptual design - from requirements definition to initial sizing, configuration layout, analysis, sizing, as well as the aeronautics and astronautics and environmental differences in which these vehicles travel. Conceptual similarities and differences between the two classes of vehicles are emphasized. The term project develops a prototype model vehicle implementation. Prerequisite: Mechanical Engineering 307

3 semester hours

Mechanical Engineering

MECHANICAL ENGINEERING 512

Computational Fluid Dynamics (CFD)

Computational fluid dynamics (CFD) is employed in a wide range of industries and disciplines, such as aerospace engineering, automotive engineering, biomedical science and engineering, chemical engineering, civil engineering, power engineering and sports engineering. Practicing engineers are constantly facing extreme challenges to solve complex fluid flow and heat transfer problems using commercial CFD software. To avoid flawed CFD simulation and results interpretation using commercial CFD packages by users with inadequate training, understanding the fundamental principles that underlie commercial CFD solvers can help the users to effectively harness the power of modern CFD for their research or design. This course is intended as an introduction to the scientific principles and practical engineering applications of CFD. It combines lectures on the CFD principles with projects of research or industrial applications. The emphasis of this course is not to teach the theory behind the CFD techniques, but to help the students apply the knowledge gained into practical use of commercial CFD software (COMSOL, ANSYS and/or STAR-CCM+). Students will apply these skills to relevant engineering applications and gain an appreciation of the limitations and advantages of CFD modeling. Prerequisite: Mechanical Engineering 307, Mechanical Engineering 363, or consent of instructor.

3 semester hours

MECHANICAL ENGINEERING 523

Advanced Composite Materials

Composite materials are ideal for structural applications where high strength-to-weight and stiffness-to-weight ratios are required. Aircraft and spacecraft are typical weight sensitive structures in which composite materials cost-effective. Usually, composite materials consist of two separate components, the matrix and the filler. The matrix is the component that holds the filler together and the filler makes the material strong. Most aerospace-application composites have strong, stiff long fibers as the fillers. The fiber makes the material behaves differently in different directions. This anisotropic behavior introduces complication in the analysis of the composite material. The course introduces the student to the basic concepts of the mechanical behavior of composite materials. Specific topics include the stress-strain relation for a lamina, micromechanics of composite materials, bending, buckling, and vibration of composite plates with various laminations, fatigue, fracture mechanics, and

joints of composite structures. Prerequisite: Mechanical Engineering 310.

3 semester hours

MECHANICAL ENGINEERING 530 (MEEG 530/TCMG 530)

Foundations of Manufacturing Management

The objectives of the course are to understand and apply concepts and techniques in manufacturing management. The course includes the management of people (both traditional and high performance systems and teams), lean manufacturing techniques as used on the factory floor, and recent concepts such as Factory Physics. The course focuses on those issues that are important in supervising and managing a modern manufacturing operation. Prerequisites: graduate standing.

3 semester hours

MECHANICAL ENGINEERING 540

Simulation and Modeling Techniques

The purpose of this course is to provide an in depth coverage of the use of simulation and modeling as an analysis tool for the study of production and distribution processes. The course aims to develop a sense of critical thinking, learning and problem solving. Topics include: problem formulation, data collection and analysis, random variable generation, and statistical analysis of output. Utilizes a major simulation language, SIMAN.

3 semester hours

MECHANICAL ENGINEERING 546 (MEEG 546/TCMG 546)

Engineering Economics and Management

The course covers the concepts and methods that will assist engineering and technology managers and professionals to make alternative investment and funding decisions regarding projects, programs, products, business expansion and other alternatives using the financial calculations involving time value of money (IRR, ROI, NPV), uncertainty and risk. Topics include engineering and related financial evaluation techniques and formulas, choosing among alternatives, sensitivity analysis, economic analysis, opportunity costs, depreciation, amortization, probability, cost estimating and systems and others. Prerequisites: TCMG 484.

3 semester hours

MECHANICAL ENGINEERING 550

Aerodynamics and Hydrodynamics in Sports

The course is intended to instruct the student in general topics in sports aerodynamics and hydrodynamics and sport specific advanced topics, develop the methods and means of formulating the mathematical models of physical systems, develop problem-solving skills, develop knowledge and skill in experimental

and numerical methods in areas of aerodynamics and hydrodynamics-related mechanical engineering. Prerequisite Mechanical Engineering 307.

3 semester hours

MECHANICAL ENGINEERING 560 (BMEG 560/MEEG 560)

Advanced Tissue Engineering

This course deals with specific elements of tissue engineering design and analysis. Approaches to the regeneration of three tissue systems will be analyzed utilizing engineering design. Concepts ranging from tissue development and dynamic growth conditions to ultimate tissue properties will be addressed. Students will be required to acquire understanding and expertise from analysis of primary literature and will complete group presentations on directed approaches to tissue design and engineering in three tissue systems. To ensure in-depth understanding of different aspects of tissue engineering the groups will be required to focus on one or two key aspects in each mini design module.

3 semester hours

MECHANICAL ENGINEERING 562 (MEEG 562/BMEG 562/ELEG 562)

Nanofabrication with Soft Materials

This is an advanced level graduate course focusing on fabrication of soft materials. Nanofabrication processes and Nano system products will be discussed. Fundamentals associated with chips fabrications and linking them toward soft materials assembly will be detailed. Emerging nanotechnology based methods for soft and green electronics, mechanical parts, MEMS, PCBS will be covered. Gene chip, label free sensory assay using micro and Nano fluidics will be discussed. Transfer printing, DNA-protein interactions using the chip and several Nano-scale assemblies for soft materials fabrication will be discussed.

3 semester credits

MECHANICAL ENGINEERING 565 (MEEG 565/BMEG 565)

Biomedical Materials and Engineering

This course introduces the students with the progress of biomaterials used in biomedical engineering. This course discusses modern advanced level biomaterials and their engineering principles associated with their biomedical use. Hip, knee Prostheses, implants, grafts, sutures, stents, catheters materials and their application in Biomedical Engineering are covered. Designed biomaterials such as silicones, polyurethane, Teflon, hydrogels, bio nanocomposites are detailed. Modern Biology and biomedical engineering such as protein absorption, bio specific medical mate-

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rials, nonfouling materials, healing and foreign body reaction, controlled release etc. are discussed. Surface-immobilized biomolecules in patterned surfaces are explained with specific examples of the use of immobilized biomolecules, immobilized cell ligands, and immobilization methods. Recent advances in biomedical engineering from the perspectives of inkjet printing of cells and tissues for 3D medical textiles, nanofibers and films in biomedical engineering by electrostatic spinning, bio-inspired materials through layer by layer (LBL) assembly and biogels and advanced instrumentations in biomedical engineering are updated. Artificial red blood and skin substitutes, orthopedic biomaterials applications adhesives and sealants, diagnostics, biomedical sensors, extracorporeal artificial organs and ethical issues of biomedical engineering are discussed.

3 semester hours

MECHANICAL ENGINEERING 567 (MEEG 567/BMEG 567)

Physiological Fluid Mechanics

There is a great and vital difference between the transport processes in the human body from other engineering systems. A thorough understanding of physiological fluid mechanics is essential for innovation in medical assist and monitoring devices. Emphasis in this course is placed on assist devices, flow and thermal measurements, modeling for engineering application, and understanding application to biomedical problems.

3 semester hours

MECHANICAL ENGINEERING 572

Production Technology and Techniques

This course will focus on the process of developing creative solutions to issues in production technology and techniques. The topics cover the concepts of production layout, production processes, quality assurance and control, principles of manufacturing processes, and technology's role in assisting manufacturing processes in today's US industries. Two formal projects are assigned regarding the latest technologies in production that are used to support business products. The target of this class is to help students obtain a basic knowledge in production technologies and techniques, and help students get ready to face the challenging industrial and engineering job market. Prerequisites: Engineering 111, Engineering 300.

3 semester hours

MECHANICAL ENGINEERING 573

Supply Chain Management

The goal of this course is to cover not only high-level supply chain strategy and concepts, but also to give students a solid understanding

of the analytical tools, to understand supply chain design, planning, and operation driven the performance of a firm. It also conveys how supply chain drivers used on a conceptual level during supply chain design and operation leading to performance improvement.

3 semester hours

MECHANICAL ENGINEERING 574

Principles of Logistics

This course presents materials management, logistics theory and concepts in today's manufacturing and commercial environments. It integrates all of the functional areas of the business as well as incorporating logistics into corporate operation. They are examined in light of how they interrelate with other functions for the firms. Pre-requisites: Engineering 111, Engineering 300.

3 semester hours

MECHANICAL ENGINEERING 575

Manufacturing Strategy

This course provides the necessary strategic perspective for manufacturing managers' sights and sustaining manufacturing excellence in the competitive manufacturing environment. The strategic perspective of manufacturing forms that the approach places these issues within the rightful context. It emphasizes the essential requirement to link with other functions in order to determine the best strategies for the business as a whole.

3 semester hours

MECHANICAL ENGINEERING 577

Lean Manufacturing

This course is designed to provide the opportunity for students to learn and apply the principles of lean manufacturing operations and other processes including those found in service industries. The specific techniques and skills required to identify opportunities for improvement, implement improvements, and measure the results of improvement activities will be covered in depth. The Plan, Do, Check, Act (PDCA) cycle and the Define, Measure, Analyze, Improve, Control (DMAIC) methodology will be introduced as important conceptual frameworks for all types of improvement activities in a wide range of manufacturing operations. The importance of lean processes in maintaining the viability and improving the competitive position of an enterprise will be stressed in the coursework.

3 semester hours

MECHANICAL ENGINEERING 580 (TCMG/MEEG/ELEG 580, DSNMG 580, MGMT 585, IDDSN 480)

New Product Commercialization

The objectives of the course are to understand

and apply concepts and techniques of product commercialization. The course focuses on taking student created product concepts and having student teams drive the concepts to become actual products. Product design, prototype creation, market analysis, and financial analysis all come together within the student team to create a viable product.

3 semester hours

MECHANICAL ENGINEERING 597 A

Master's Project

Lecture hours and topics to be arranged with Department Chair.

1 credit hour

MECHANICAL ENGINEERING 597 B

Master's Project

Lecture hours and topics to be arranged with Department Chair.

2 credit hours

MECHANICAL ENGINEERING 597 C

Master's Project (completion)

Lecture hours and topics to be arranged with Department Chair.

1 credit hour

MECHANICAL ENGINEERING 598

Thesis in Mechanical Engineering

Lecture hours, semester hours and topics to be arranged.

3-6 semester hours

MECHANICAL ENGINEERING 599

Independent Study in Mechanical Engineering

Independent study of advanced topics in Mechanical Engineering and submission of project report as required. Problem assignment to be arranged with and approved by the Department Chair.

3 semester hours

Naturopathic Medicine

Basic Sciences

BASIC SCIENCES 511

Anatomy I

This course provides an in depth study of the macroscopic human anatomy and it covers the structure of the trunk and posterior neck. Clinical aspects of the vascular and neurological relationships of these regions will be emphasized.

4 lecture hours; 4 semester credits

BASIC SCIENCES 511 L

Anatomy I Lab

Anatomy laboratory to apply and reinforce information acquired in lecture. Exercises include the dissection of human cadavers and

Naturopathic Medicine

the study of bones, models and interactive multimedia software.

3 laboratory hours; 1.5 semester credits

BASIC SCIENCES 512

Histology

This course is the study of the normal microscopic anatomy of the body and its relationship to function at the cellular, tissue, and organ level. Included is the study of the microstructure of epithelia, connective tissue, muscle, nervous system, digestive system, circulatory, reproductive systems and the endocrine system. Where indicated, there is an integration of normal histology with physiological and clinical concepts.

2 lecture hours; 2 semester credits

BASIC SCIENCES 513

Embryology

This course covers the developmental process of humans from conception to birth including the formation of tissues, organs and systems of the body, integrating histology and anatomy.

1 lecture hour; 1 semester credit

BASIC SCIENCES 514

Biochemistry I

This course introduces the student to the fundamentals of protein structure, DNA replication, gene expression, transcription, and translation.

2 lecture hours; 2 semester credits

BASIC SCIENCES 515

Physiology I

This course is the study of physiology at the molecular and cellular level. Included is the study of the function of all major tissues and organ systems. Clinical concepts and correlations are discussed.

3 lecture hours; 3 semester credits

BASIC SCIENCES 521

Anatomy II

This course is a continuation of Anatomy I and it covers the structure of the head, anterior neck and extremities. Clinical aspects of the neurological and vascular relationships of these regions will be emphasized. Prerequisites: NBS 511, NBS 511 L, NBS 512, NBS 513

4 lecture hours; 4 semester credits

BASIC SCIENCES 521 L

Anatomy II Lab

Anatomy laboratory to apply information acquired in lecture. Exercises include the dissection of human cadavers and the study of bones, models and interactive multimedia software. Prerequisites: NBS 511, NBS 511 L, NBS 512, NBS 513

3 laboratory hours; 1.5 semester credits

BASIC SCIENCES 522

Public Health I

Introduction to basic concepts of public health and epidemiology. Exploration of historical and contemporary cases in public health that shape current understanding of population health and disease prevention. Methods of instruction include lecture, discussion, assigned reading, and group work. Laboratory portion will focus on active identification, measurement, and problem-solving of common issues in the surrounding community. Prerequisite: NPS 501

1 lecture hour; 1 laboratory hour; 1.5 semester credits

BASIC SCIENCES 523

Public Health II

Exploration of themes in public health and epidemiology through the perspective of the naturopathic doctor in clinical practice. Connecting historical and contemporary problems in public health to clinical reasoning and naturopathic problem-solving. Methods of instruction include lecture, discussion, assigned reading, and group work. Laboratory portion will focus on active use of public health tools to solve problems in the surrounding community. Prerequisite: NBS 522

2 lecture hours; 2 semester credits

BASIC SCIENCES 524

Biochemistry II

This course is a continuation of NBS 514 Biochemistry I. Prerequisite: NBS 514, NBS 515

2 lecture hours; 2 semester credits

BASIC SCIENCES 525

Physiology II

This course is a study of the physiology at the organ and systems level and its interrelationships. Included is the study of the circulatory, endocrine, respiratory, renal, gastrointestinal, urogenital and nervous system. There is an integration of normal and pathological physiology and clinical concepts. Prerequisites: NBS 511, NBS 512, NBS 514, NBS 515.

3 lecture hours; 3 semester credits

BASIC SCIENCES 526

Neuroscience

This course covers the anatomy and physiology of the central nervous system and of the cranial nerves. The organization of cortical and subcortical motor and sensory systems including the basal ganglia, cerebellum, and the brainstem is covered as well as higher cortical functions and parcellation of function in the cerebral cortex. Prerequisites: NBS 511, NBS 512

2 lecture hours; 2 semester credits

BASIC SCIENCES 527

Microbiology I

Comprehensive overview of structure, func-

tion, growth, and genetics of microorganisms. Methods of instruction include lecture, discussion, and assigned reading.

1 lecture hour; 1 semester credit

BASIC SCIENCES 528

Microbiology II

Bacteriology, virology, and mycology with an emphasis on modes of transmission, symptoms, diagnosis, treatment, and prevention of associated diseases. Methods of instruction include lecture, discussion, and assigned reading. Prerequisite: NBS 527

1.5 lecture hours, 1.5 semester credits

BASIC SCIENCES 529

Biomedical Integration Lab I

This course integrates the concepts of anatomy, physiology, biochemistry, and histology in a case-based format.

2 laboratory hours; 1 semester credit

BASIC SCIENCES 530

Biomedical Integration Lab II

This course is a continuation of NBS 529 Biomedical Integration Lab I. This course integrates the concepts of anatomy, physiology, biochemistry, and histology in a case-based format. Prerequisites: NBS 511, NBS 512, NBS 514, NBS 515, NBS 529.

2 laboratory hours; 1 semester credit

Botanical Medicine

BOTANICAL MEDICINE 511

Botanical Pharmacy Lab

This course introduces the history, identification, plant taxonomy, and nomenclature of medicinal plants used by the Naturopathic Physician, while providing practical experience in the preparation and extraction of botanical medicines.

1 laboratory hour; 0.5 semester credit

BOTANICAL MEDICINE 521

Phytopharmacognosy

This course is an overview of biochemical plant constituents, their interactions, energetics and synergy. Indications and contraindications of applications as well as drug/herb/supplement interactions are explored.

1.5 lecture hours; 1.5 semester credits

BOTANICAL MEDICINE 611

Botanical Medicine I

This course comprises a detailed survey of plants and plant preparations used in naturopathic practice, integrating traditional herbal knowledge with modern pharmacological research. The botany and ethnobotany, pharmacodynamics, phytochemistry, toxicology, and therapeutics of each plant are considered. Prerequisites: NBM 511, NBM 521, NBS 524,

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NBS 525.

2 lecture hours; 2 semester credits

BOTANICAL MEDICINE 621

Botanical Medicine II

This course is a continuation of Botanical Medicine I. Safe, effective, and appropriate prescription of plant medicines in patient care, based on both historical information and current scientific knowledge. Prerequisite: NBM 611.

2 lecture hours; 2 semester credits

BOTANICAL MEDICINE 711

Botanical Medicine III

This course is a continuation of Botanical Medicine II and includes advanced topics in botanical medicine, including materia medica, clinical applications, and current research. Prerequisite: NBM 621.

1.5 lecture hours; 1.5 semester credits

Clinical Nutrition

NUTRITION 611

Nutrition I

This course provides the foundation for therapeutic nutrition. It explores the biochemistry of the macronutrients as well as the known vitamins and minerals in detail. Toxicities, deficiencies, therapeutic uses and appropriate doses are examined. Dietary requirements for micro and macro nutrients are covered. Prerequisites: NBS524, NBS525

2 lecture hours; 2 semester credits

NUTRITION 621

Nutrition II

Nutrition II builds on the concepts learned in Nutrition I. Basic concepts of nutritional counseling, nutraceutical supplementation therapy, and therapeutic diet prescriptions are covered. Prerequisite: NNT611.

2 lecture hours; 2 semester credits

NUTRITION 711

Nutrition III

This course builds on previous nutrition courses, biochemistry, and research methods to focus on how to safely and effectively use vitamins, minerals, amino acids and other nutrients to improve health and address disease. Drug-nutrient interactions, nutrient-nutrient interactions, and food nutrient interactions are learned, as well as, how to apply naturopathic principles to therapeutic prescription of nutrients. Prerequisites: NNT621, NCS621

2 lecture hours; 2 semester credits

NUTRITION 721

Nutrition IV

This course builds on previous nutrition courses and focuses on the use of food as medicine and therapeutic diets and clinical nutri-

tion. Students will be expected to synthesize knowledge from biochemistry and basic nutrition for application to clinical conditions and lifespan issues. This class also explores current research and trends in nutrition and socioeconomic and cultural aspects related to food and diet therapy.

Prerequisite: NNT711.

1.5 lecture hours; 1.5 semester credits

Clinical Sciences

CLINICAL SCIENCES 512

Emergency Medicine I

Training and practice in identifying and responding to emergent situations. Includes CPR and AED training. Methods of instruction include assigned reading and experiential work.

1 laboratory hour; 0.5 semester credit.

CLINICAL SCIENCES 611

Introduction to Pathology

The pathology I lecture/lab series introduces the student to the fundamental basis of disease by studying pathophysiology on both cellular and genetic scales. Such studies include cell death and adaptation, inflammation, tissue regeneration and fibrosis, hemodynamic disorders, neoplasia, genetic diseases, and infectious disease. Each pathophysiologic process studied is placed in a clinical context by reviewing associated physical, radiographic, gross, and microscopic findings. Laboratory exercises require the student to apply information acquired in lecture to various clinical scenarios that are more frequently encountered in practice. The course concludes with the beginning of the study of diseases by organ system. Prerequisites: NBS 512, NBS 513, NBS 521, NBS 522, NBS 524, NBS 525, NBS 526

3 lecture hours, 2 laboratory hours; 4 semester credits

CLINICAL SCIENCES 612

Clinical, Physical and Laboratory Diagnosis I

This course applies the knowledge of pathology, physical exam, and laboratory testing to develop the skills necessary to determine appropriate diagnoses for patients manifesting the signs and symptoms of disease. The material is covered for each organ system with an emphasis on the integration of information from multiple systems. Prerequisites: NBS 512, NBS 513, NBS 521, NBS 522, NBS 524, NBS 525, NBS 526

6 lecture hours, 6 semester credits

CLINICAL SCIENCES 612L

Physical Examination Lab I

This lab course focuses on the development of physical examination skills, including the

competent use of medical instrumentation. Students become proficient in the comprehensive examination of each body system, including relevant specialized tests. Students develop medical reasoning and decision-making skills as they learn to differentiate between normal and abnormal physical findings and begin to assess which diagnostic procedures are appropriate based on the patient's history and medical concerns. This course is offered in conjunction with other courses in laboratory and clinical diagnosis, creating a solid foundation for the development of clinical judgment. Lab Fee. Co-requisite NCS 612

2 laboratory hours, 1 semester credit

CLINICAL SCIENCES 613L

Laboratory Diagnosis Lab I

In this course students will learn to perform in-office laboratory procedures including venipuncture. Co-requisite: NCS 612.

1 laboratory hour; 0.5 semester credit

CLINICAL SCIENCES 616

Immunology

This course covers specific and non-specific components of the human immune system and the role played by each in protection from microbes and non-living agents. Hypersensitivity reactions, immunodeficiency, autoimmune diseases, immune responses to cancer and psychoneuro-immunology are also discussed. Prerequisites: NBS 525, NBS 522

2 lecture hours; 2 semester credits

CLINICAL SCIENCES 617

Medical Genetics

This course covers the basis, the diagnosis, and the transmission of chromosomal and genetic disorders. The role of genetics and disease and the prenatal diagnosis of genetic and chromosomal abnormalities will be discussed. Special emphasis will be placed on preparing the students to recognize potential genetic abnormalities in a clinical setting, on methodologies to educate and inform patients on the genetic basis of their particular disease and on the resources available for additional testing, treatment or counseling. Prerequisites: NBS 515, NBS 521, NBS 525

1 lecture hour; 1 semester credit

CLINICAL SCIENCES 619

Introduction to Diagnostic Imaging

This course covers radiographic anatomy and imaging techniques. A basic introduction to imaging, including radiography, computer tomography (CT), magnetic resonance imaging (MRI), ultrasound, and bone scan (scintigraphy) is discussed. The basic concepts of these techniques and their use in diagnosis are discussed. This course will also cover basic ra-

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diographic anatomy of the skeletal system and viscera. Co-requisites: NCS 611.

2 lecture hours; 2 semester credits

CLINICAL SCIENCES 621

Pathology and Diagnostic Imaging

This course continues the training of the fundamental basis of disease by studying pathophysiology on both organ system and multi-organ system scales. Organ systems studied include the cardiovascular, respiratory, urogenital, gastrointestinal, endocrine, musculoskeletal, and central nervous systems. Each pathophysiologic process studied is placed in a clinical context by reviewing associated physical, radiographic, gross, and microscopic findings. After completing this course curriculum, the student's comprehension of clinical textbooks should be self-perpetuating. Prerequisite: NCS 611

5.5 lecture hours; 5.5 semester credits

CLINICAL SCIENCES 622

Clinical, Physical and Laboratory Diagnosis II

Continued integration of pathology, physical exam, and laboratory testing for appropriate diagnosis and treatment. Prerequisite: NCS 612.

6 lecture hours; 6 semester credits

CLINICAL SCIENCES 622L

Physical Examination Lab II

This course is a continuation of Physical Examination I. Students will complete the process of learning physical examination skills for all systems of the human body. Pre-requisite: NCS-612L. Co-requisite NCS 622

2 laboratory hours; 1 semester credit

CLINICAL SCIENCES 623L

Laboratory Diagnosis Lab II

In this course, students learn all the steps of performing laboratory procedures: pre-test patient instruction, filling out requisition forms, specimen collection, venipuncture, capillary blood collection, saliva and urine collection, specimen handling and processing, and interpretation of results. Students will learn sources of laboratory errors and be able to minimize error potential. They will also learn conventional and alternative labs for various organ systems. This course is a continuation of Laboratory Diagnosis Lab I. Pre-requisite: NCS-613L. Co-requisite: NCS 622.

1 laboratory hour; 0.5 semester credit

CLINICAL SCIENCES 714

Clinical Forum I

This course explores the clinical applications of the basic sciences and the clinical courses taught concurrently in this semester. Case presentations and clinical skills are emphasized through a problem based learning format using naturopathic principles as the foundation.

2 laboratory hours; 1 semester credit

CLINICAL SCIENCES 721

Pharmacology I

Dose response relationships, pharmacokinetics, pharmacodynamics, pharmacogenetics, drug toxicity, signal transduction and second messengers are covered. Drug interactions, indications/contraindications, food/herb interactions are discussed. The pharmacology and toxicology of the drugs of the nervous, respiratory and cardiovascular systems will be examined. Prerequisites: NBS 514, NBS 515, NBS 524, NBS 525

2 lecture hours; 2 semester credits

CLINICAL SCIENCES 723

Clinical Forum II

This course is a continuation of Clinical Forum I. It further explores the clinical applications of the basic sciences and the clinical courses taught concurrently in this semester. Case presentations and clinical skills are emphasized through a problem based learning format using naturopathic principles as the foundation.

2 laboratory hours; 1 semester credit

CLINICAL SCIENCES 724

Emergency Medicine II

This course focuses on identification of emergency situations and procedures, particularly as they present in ambulatory care and general practice. The course includes discussion, demonstration, and practice of treating patients within the scope of practice. Quick response and decision-making process for referral of the patient for treatment.

2 lab hours; 1 semester credit

CLINICAL SCIENCES 811

Pharmacology II

This course, a continuation from Pharmacology I, examines the most common pharmaceutical agents in clinical practice and the ones most likely to be encountered in a clinical setting in general practice. It reviews antibiotics, antimicrobials, both steroidal and non-steroidal anti-inflammatory agents, chemotherapeutic agents, hormones, and commonly prescribed medications. Prerequisite: NCS 721.

2 lecture hours; 2 semester credits

CLINICAL SCIENCES 812

Environmental Medicine

This course focuses on the health effects of pollutants in the home, workplace as well as in the air, water, earth, and food supply. Diagnosis and treatment of health conditions caused by these pollutants is covered with special emphasis on treating the chemically sensitive patient or those with environmental illness. Prerequisites: NCS 621, NCS 622

1 lecture hour; 1 semester credit

Naturopathic Practice/Organ Systems

NATUROPATHIC PRACTICE 621

Introduction to Biochemical Individuality

This survey course introduces the naturopathic student to the basics of personalized medicine and nutrigenomics.

1 lecture hour; 1 semester credit

NATUROPATHIC PRACTICE 714

Naturopathic OB/Gyn

This course synthesizes concepts of female anatomy, physiology, and pathophysiology and applies them to clinical conditions. Physical exam, laboratory and diagnostic evaluation, and clinical diagnosis are presented for major clinical conditions. Students will be prepared to discuss normal preconception, pregnancy, and postpartum-related concerns with their patients and to competently attend unplanned, emergent, but normal deliveries. Scope of practice, consultation, and referral requirements will be discussed. Naturopathic treatment of commonly encountered gynecological and obstetrical issues is included. Prerequisites: NCS 621, NCS 622.

3 lecture hours; 3 semester credits

NATUROPATHIC PRACTICE 721

Pediatrics

Upon completion of this course the student will be able to recognize and diagnose the conditions of the pediatric patient encountered in a general naturopathic practice. Naturopathic therapy and management of these disorders are discussed along with the appropriate use of referral. Prerequisites: NCS 621, NCS 622, NCS 623L.

2 lecture hours; 2 semester credits

NATUROPATHIC PRACTICE 722

Cardiology

This course covers the pathophysiology, advanced diagnosis, and treatment of cardiovascular diseases. Both conventional and naturopathic therapies are covered, and upon completion students will be able to understand and apply this knowledge to the care of patients with cardiac disease and know when to refer for specialized diagnosis and treatment. Prerequisites: NCS 621, NCS 622, NCS 623L.

2 lecture hours; 2 semester credits

NATUROPATHIC PRACTICE 725L

Gynecology Lab

Physical examination practicum relevant to gynecology, including breast and pelvic exams. Prerequisite: NNP 714.

1 laboratory hour; 0.5 semester credit

NATUROPATHIC PRACTICE 713

Gastroenterology

This course examines the digestive tract and

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associated organs, and disorders associated with it. Physical examination, imaging, and laboratory techniques necessary to understand and diagnose these disorders are discussed along with their naturopathic treatment. Prerequisites: NCS 621, NCS 622, NCS 623L.

2 lecture hours; 2 semester credits

NATUROPATHIC PRACTICE 811

Eye, Ear, Nose and Throat

The diagnosis and naturopathic and traditional treatment of diseases of the eyes, ears, nose, and throat are discussed. Upon completion of this course students will be able to diagnose common and important diseases, know when to refer patients for specialty diagnosis and treatment, and will be able to apply naturopathic principles and modalities in case management. Prerequisites: NCS 621, NCS 622, NCS 623L.

0.5 lecture hour; 0.5 laboratory hour; 0.75 semester credit

NATUROPATHIC PRACTICE 812

Endocrinology

This course covers the diagnosis and naturopathic and traditional management of diseases and imbalances of the endocrine system. Upon completion, students will be able to recognize and diagnose hormonal disorders, know when to refer patients for specialty diagnosis and treatment, and be able to apply naturopathic principles and modalities in endocrine case management. Prerequisites: NCS 621, NCS 622, NCS 623L.

2 lecture hours; 2 semester credits

NATUROPATHIC PRACTICE 813

Neurology

This course constitutes a review of the neurological exam with emphasis on diagnosis of neurological conditions. It will include naturopathic treatment and management of diseases of the nervous system as they are discussed. Prerequisites: NBS 526, NCS 621, NCS 622, NCS 623L.

1.5 lecture hours; 1.5 semester credits

NATUROPATHIC PRACTICE 821

Geriatrics

This course covers the aging process and the new field of anti-aging medicine. Conventional geriatrics topics are discussed as well as topics on geriatric illnesses and their naturopathic interventions. Prerequisites: NCS 621, NCS 622, NCS 623L.

1 lecture hour; 1 semester credit

NATUROPATHIC PRACTICE 814

Urology/Proctology

This course covers disorders of the urinary system, male genitalia, and the anal-rectal region. Diagnosis and conventional and naturopathic management of cases are covered. Prerequisites:

NCS 621, NCS 622, NCS 623L.

1 lecture hour; 1 semester credit

NATUROPATHIC PRACTICE 823

Oncology

This course covers the diagnostic, prognostic and preventative and epidemiological information for common cancers. Various theories of cancer are discussed as well as both traditional and non-traditional treatments. Case studies are used to help cement the concepts covered in relation to various malignancies. At the conclusion of this course students will be prepared to screen for common cancers and co-manage patients with cancer. Prerequisites: NCS 621, NCS 622, NCS 623L.

1.5 lecture hours; 1.5 semester credits

NATUROPATHIC PRACTICE 824

Dermatology

The diagnosis and treatment of diseases which manifest in skin lesions are discussed. Naturopathic treatment and prevention are taught. Prerequisites: NCS 621, NCS 622, NCS 623L.

1.5 lecture hours; 1.5 semester credits

NATUROPATHIC PRACTICE 825

Minor Office Procedures

Minor surgical procedures as defined by the scope of practice for naturopathic physicians are taught. The course covers common minor surgery office procedures such as suturing techniques, wound care, local anesthesia, and bandaging techniques. Topics also include recognizing and treating infection, burns, and conditions requiring referral for surgical intervention. Prerequisite: NCS 622.

1 lecture hour; 1 laboratory hour; 1.5 semester credits

NATUROPATHIC PRACTICE 826

Rheumatology

This course explores the structure and function of the musculoskeletal, connective tissue, lymphatic, vascular, and immunologic systems as they pertain to rheumatologic health and disease. Emphasis is placed on prevention, screening, diagnosis, and treatment of rheumatologic symptoms and conditions. Prerequisites: NCS 621, NCS 622, NCS 623L.

1 lecture hour; 1 semester credit

Naturopathic Principles and Practice

PRINCIPLES AND PRACTICE 513

Medical Ethics

An introduction to the principles of medical ethics. Provides a basis for the discussion of therapeutic choices and the role of the doctor in difficult medical decisions that will be reinforced throughout clinical studies. Learning strategies include lecture, discussion, assigned

reading and written reflection. Prerequisites: None. Required for: Public Health I, Psychological Assessment, Clinical Practicum I.

0.5 lecture hour; 0.5 semester credit.

PRINCIPLES AND PRACTICE 512

History and Philosophy of Naturopathic Medicine

This course will explore the philosophical foundations of naturopathic medicine, which form the basis for therapeutic intervention. Vitalistic medicine in the United States of America as an influence on the creation of the naturopathic profession will be discussed. The overall emphasis of the course will be on the philosophical principles that define the empirical "natural laws" which describe the phenomenon of healing. The relationship of naturopathic principles to medical science is included. This course will also examine the historical, socioeconomic, and political foundations of Naturopathic Medicine and its eclectic blend of healing arts and fundamental roots; Botanical Medicine, Nature Cure, Physical medicine, Hydrotherapy, Homeopathy, Energy Medicine, and Ancient Healing systems from around the globe.

2.5 lecture hours; 2.5 semester credits

PRINCIPLES AND PRACTICE 722

Philosophy of Naturopathic Medicine II

Nature acts powerfully through healing mechanisms in the body and mind to maintain and restore health. Students will receive a more in-depth utilization of naturopathic methods and medicinal substances, which work in harmony with the human system, thus facilitating long-lasting health and recovery. In addition to employing various natural medicines, students will gain an important perspective of the vital force and its role in the healing process when used in conjunction with naturopathic principles. Prerequisite: NPP 512.

1 lecture hour; 1 semester credit

PRINCIPLES AND PRACTICE 711

Practice Management I

Students are taught procedures for the establishment and operation of a private practice. Practical aspects of small business management are discussed. Students are encouraged to begin thinking about their personal career path in naturopathic medicine. Prerequisites: NCS 611, NCS 612, NCS 613, NCS 621, NCS 622, NCS 623.

1 lecture hour; 1 semester credit

PRINCIPLES AND PRACTICE 813

Fundamentals of Entrepreneurship

This course will begin by addressing the concepts of entrepreneurship and developing a new venture. The course will address fundamentals such as the types of financing impor-

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tant to the new venture and the finances of its creator, competitive positioning, branding and imaging, stationery, marketing, protecting intellectual property, the legal entity structure, the website development components and cost, insurance, labor and sales and use tax along with basic HR requirements. The class will learn how to source capital and then further how to pitch to capital providers. Each student will develop a minimum viable product by producing a business model canvas.

3 lecture hours; 3 semester credits

PRINCIPLES AND PRACTICE 821

Medical Jurisprudence

The course covers the basics of law as it applies to medical practice, informed consent, confidentiality, and professional liability. Naturopathic practice in licensed and unlicensed states will be discussed, as well as an in depth review of the practice act in Connecticut. The ethical practice of naturopathic medicine will also be discussed. Prerequisites: NCS 621, NCS 622, NCS 623.

0.5 lecture hour; 0.5 semester credit

PRINCIPLES AND PRACTICE 822

Practice Management II

This course introduces the student to the business procedures and practice used in the successful operating of a naturopathic practice. Prerequisite: NPP 711.

2 lecture hours; 2 semester credits

PRINCIPLES AND PRACTICE 823

Applied Medical Ethics

Medical ethics with an emphasis on the unique problems faced by the naturopathic physician. Topics include patient autonomy and choice, selection of appropriate therapies, and coordination of patient care with practitioners from other disciplines. Learning strategies include lecture, discussion, group work, assigned reading, and written reflection. Prerequisites: NPP 511, completion of basic science classes and passed Clinic Promotion Exam.

0.5 lecture hour; 0.5 credit

Homeopathic Medicine

HOMEOPATHIC MEDICINE 621

Homeopathy I

This course lays the foundation of the basic laws and principles of Homeopathy upon which future courses will build. The principles as set forth by Hahnemann in his Organon are the bases of the course. The student will also become thoroughly acquainted with the use of Kent's repertory.

2 lecture hours; 2 semester credits

HOMEOPATHIC MEDICINE 711

Homeopathy II

This course will continue the examination of Homeopathy, with emphasis on the concept of acute prescribing, case taking, and analysis. Students will continue their discussion and understanding of the drug pictures of the remedies for acute complaints commonly seen in a general or family practice.

Prerequisite: NHM 621

2 lecture hours; 2 semester credits

HOMEOPATHIC MEDICINE 721

Homeopathy III

Students will continue their study of the hierarchy of symptoms as they are expressed in the repertory and will begin to recognize the keynote symptoms of polycrest remedies and be able to distinguish among them. Computer repertorization is used throughout to illustrate the relative values of possible rubrics to include in a given case. Prerequisites: NHM 621, NHM 711

2 lecture hours; 2 semester credits

Traditional Chinese Medicine

NATUROPATHIC TRADITIONAL CHINESE MEDICINE 511

NTCM I

The course sequence gives students the tools to integrate the basic philosophical concepts of TCM into naturopathic practice. In this introductory course, students will begin to apply TCM principles and medical philosophy to the human body. They will develop a basic understanding of the relationships between the TCM zangfu ("organs"), and of TCM modes of diagnosis, as found in the "Four Examinations" and "Eight Principles", including pulse, tongue, facial, palpation, and questioning techniques.

2 lecture hours; 2 semester credits

NATUROPATHIC TRADITIONAL CHINESE MEDICINE 521

NTCM II

Students begin the study and practice of basic acupuncture and moxibustion techniques. Students will learn to identify meridians and acupuncture points. The basic tenets of clean needle technique and safe needle insertion as they relate to acupuncture will be covered. Students will learn and practice basic acupuncture protocols for common complaints. Prerequisite: NTCM 511.

2 lecture hours; 2 semester credits

NATUROPATHIC TRADITIONAL CHINESE MEDICINE 721

NTCM III

Students continue the study of traditional Chinese medicine as it is used in naturopathic practice. Students will practice diagnostic skills using physical examination and the ten questions, and identify patterns of Zang-Fu dishar-

mony. They will learn and practice treatment techniques including needling, moxibustion, electroacupuncture, acupressure, and cupping. Required for students matriculating in 2017 and later. Prerequisite: NTCM 521.

1 lecture hour; 2 laboratory hours; 2 semester credits

NATUROPATHIC TRADITIONAL CHINESE MEDICINE 722

NTCM IV

Students continue to practice diagnostic skills and treatment techniques. Management of more complex cases will be addressed, including appropriate referrals to TCM specialists, medical doctors, and other healthcare providers. Required for students matriculating in 2017 and later. Prerequisite: NTCM 721

1 lecture hour; 2 laboratory hours; 2 semester credits

Further study in TCM may be taken through the Acupuncture Institute. Refer to the catalog section on Acupuncture.

Physical Medicine

PHYSICAL MEDICINE 522

Living Anatomy: Palpation

This laboratory course introduces how to locate and palpate the bony landmarks, attachments/origins, and the superficial musculature of the entire body. It is an adjunct to the Anatomy courses and a precursor to the courses in physical medicine.

1.5 laboratory hours; 0.75 semester credits

PHYSICAL MEDICINE 523

Hydrotherapy

This course introduces students to the physiological principles and the clinical application of the therapeutic use of water, heat, and cold. In the laboratory portion of this course, students learn procedures by administering and receiving treatments and determining appropriate applications. Prerequisite: NBS 511.

1 lecture hour; 1.5 laboratory hours; 1.75 semester credits

PHYSICAL MEDICINE 612

Physiological Therapeutics

This course covers the physical, clinical, and contraindications of the use of heat, cold, high-volt galvanism, interferential current, low-volt galvanism, ultrasound, electrical muscle stimulation, diathermy, and paraffin. Upon completion, students will be able to use these modalities both individually and in conjunction with other therapies in the treatment of musculoskeletal and other disorders. Prerequisites: NBS 521, NBS 525.

1 lecture hour; 1 semester credit

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PHYSICAL MEDICINE 612L

Physiological Therapeutics Lab

Laboratory component of NPM 612 Physiological Therapeutics. Co-requisite: NPM 612. Prerequisites: NBS 521, NBS 525.

2 laboratory hours; 1 semester credits

PHYSICAL MEDICINE 621

Orthopedic Assessment

Students in this course will learn to diagnose orthopedic injuries and diseases. Those conditions that can be safely treated in a general practice setting are distinguished from those requiring referral to a specialist. Prerequisites: NBS 511, NBS 515, NBS 521, NBS 525.

1 lecture hour; 1 laboratory hours; 1.5 semester credits

PHYSICAL MEDICINE 711

Naturopathic Manipulative Therapeutics I

This course is a basic presentation of the principles and practices of manipulation of the axial spine. Lecture includes discussion of the neurological rationale for manipulation, as well as various methods of manipulation (both force and non-force techniques). Soft-tissue techniques such as Post-Isometric Relaxation Technique and Positional Release Technique will be discussed and taught in lab. Palpation, neurological and orthopedic evaluation will be performed prior to any manipulative procedures. Prerequisite: NPM 621

1 lecture hours; 3 laboratory hours; 2.5 semester credits

PHYSICAL MEDICINE 721

Naturopathic Manipulative Therapeutics II

This course will extend NPM711 by introducing principles and biomechanics of extremities as well as gait analysis. Non-force techniques such as Sacral-Occipital Technique (SOT) and Cranial-Sacral Techniques will be reviewed. Prerequisite: NPM 711

1 lecture hours; 3 laboratory hours; 2.5 semester credits

PHYSICAL MEDICINE 821

Therapeutic Exercise/Sports Medicine

This course provides an overview of exercise as a preventative and therapeutic tool. Students will learn to perform a fitness assessment and describe and monitor exercise programs for persons with a variety of common disease conditions as well as treatments for sports injuries. Prerequisite: NPM 721

2 lecture hours; 2 semester credits

Psychology

PSYCHOLOGY 511

Physician Self-Care

This course highlights the importance of self-

reflection and self-care for those training to be Naturopathic Physicians. Students will explore the multidimensional aspects of health, the impact of stress on health, and effective strategies and tools for managing stress and attending to one's health in a truly holistic manner. Introspective work and in-class discussions and exercises will be done.

1 laboratory hour; 0.5 semester credit

PSYCHOLOGY 501

Counseling Skills I

This course provides an introduction to developing the naturopathic practitioner/patient relationship via the development of communication skills. Professional issues such as ethics, confidentiality, trust, appropriate boundaries, and relationship building are included. Specific communication skills related to effective patient interviewing are practiced experimentally using exercises in class. Students practice the skills of attending, empathy, active listening, and focusing on important client concerns to identify and begin collaborative goal setting.

1 lecture hour; 1 laboratory hour; 1.5 semester credits

PSYCHOLOGY 621

Psychological Assessment

This course covers the diagnosis of psychiatric disorders according to the Diagnostic and Statistical Manual of Mental Disorders. Included is the development of the DSM, psychological assessment considerations, referral options, and treatment modalities including psychotherapeutic, psychotropic, and alternative interventions. Special attention is paid to addictions and eating disorders. Prerequisite: NPS 501.

2 lecture hours; 2 semester credits

PSYCHOLOGY 711

Counseling Skills II

This course introduces current holistic counseling theories and interventions through lectures, assignments, readings, and experiential exercises. Counseling skills with reference to actual cases are explored using problem-based learning methods. Students will demonstrate basic interviewing techniques and strategies for engaging and motivating the client through reciprocal dialogue during the developmental stages of a counseling relationship. This course emphasizes the basic counseling skills required of a physician in daily practice, in addition to the special circumstances of bereavement, crisis management, and chronic and terminal illness. Prerequisites: NPS 501.

1 lecture hour; 1 laboratory hour; 1.5 semester credits

PSYCHOLOGY 813

Mind-Body Medicine

This course covers key issues in the relationship between a physician and client. It includes an examination of ethical issues, confidentiality, and development of trust, setting appropriate boundaries, and dealing with patients with a variety of conditions. Prerequisites: NPS 501, NPS 621, NPS 711.

1 lecture hour; 1 semester credit

Research

RESEARCH 511

Research

This course introduces students to biomedical research principles, epidemiology, biostatistics, and accessing medical literature with an emphasis on complementary and alternative medicine research.

2 lecture hours; 2 semester credits

RESEARCH 711

Thesis I

In this course the student performs a literature search in a naturopathic area of interest and presents a proposal for a Senior Paper (literature survey only) or a Senior Research Paper (also includes original research). Each student chooses a faculty advisor for their thesis. Original research must be approved by the Research Committee. Prerequisite: NRS 511.

0.5 lecture hour; 0.5 semester credit

RESEARCH 811

Thesis II

With the advice and guidance of the thesis advisor, the student prepares and submits a complete first draft of a Senior Paper in conformity with the guidelines adopted by the Research Committee. Prerequisite: NRS 711.

0.5 lecture hour; 0.5 semester credit

RESEARCH 822

Thesis III

With the advice and guidance of the thesis advisor, the student makes revisions to the first draft and submits a final version of the Senior Paper. Students may also be required to present their papers before a committee of faculty advisors. Prerequisite: NRS 811.

0.5 lecture hour; 0.5 semester credit

Clinical Education

CLINICAL EDUCATION 612

Introduction to Clinic

This course introduces students to the clinical education component of the program. Clinical education requirements, policies, and protocols, are outlined. Students are introduced to hands-

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on patient care skills, such as taking a brief history and assessing vital signs. Other topics include privacy and security of patient information (HIPAA), cultural competence, doctor/patient communication skills, and professionalism. *0.5 lecture hour; 0.5 semester credit*

CLINICAL EDUCATION 631

Clinical Practicum I

Through clinical observation and hands-on experience, this course prepares students for their clinical education. Students will shadow staff and physicians in the clinical environment, and when directed will assist with tasks and patient care. Students will gain hands on experience with electronic medical records (EMR), will be required to take vitals, and assist in hydrotherapy treatments. Prerequisite: NCE-612 *1 laboratory hour; 0.5 semester credit*

CLINICAL EDUCATION 641

Clinical Practicum II

A continuation of Clinical Practicum I. Through clinical observation and hands-on experience, this course prepares students for their clinical education. Students will shadow staff and physicians in the clinical environment, and when directed will assist with tasks and patient care. Students will gain hands on experience with electronic medical records (EMR), will be required to take vitals, and assist in hydrotherapy treatments. Prerequisite: NCE-631 *1.5 laboratory hours; 0.75 semester credit*

CLINICAL EDUCATION

700-LEVEL CLINICAL ROTATIONS

As Secondary Student Clinicians, students begin to gain practical clinical skills by working under the supervision of licensed health care providers. Students learn primarily through observation and are given limited responsibility in the clinical setting during the fall semester. Performance objectives are focused on basic clinical procedures. In the spring semester of their third year, Secondary Student Clinicians continue the clinical training begun in the fall, which includes the ongoing development of clinical skills and case management under the supervision of licensed physicians. Students gradually assume increased responsibility.

CLINICAL EDUCATION

800-LEVEL CLINICAL ROTATIONS

As Primary Student Clinicians, students assume the role of primary care giver under the direct supervision of a licensed physician. Physical examination, diagnostic assessment, and treatment skills are honed while specific performance objectives of clinical training are met. In this final semester of clinical training, students examine, diagnose, and treat patients in preparation for providing primary care as a

naturopathic physician.

Types of Clinical Rotations Offered

CLINICAL EDUCATION 635

Hydrotherapy Shift

Second year students begin to gain practical clinical skills in the area of hydrotherapy by working under the supervision of licensed naturopathic physician. Hydrotherapy techniques include constitutional hydrotherapy, infrared sauna, wet sheet pack, Russian steam, fomentations, contrast baths, peat baths, and paraffin baths. Performance objectives are focused on basic hydrotherapy treatments and case management. Prerequisites: NPM 523; successful completion of all Year 1 courses. *24 clinic hours, 0.67 semester credit*

CLINICAL EDUCATION 700/800

General Medicine

Students begin to gain practical clinical skills by working under the supervision of licensed health care providers. Students learn through observation with progressively increasing responsibility in the clinical setting. Students perform physical exams, diagnostic assessments, and develop treatment programs for patients with a wide variety of health conditions. *72 clinic hours, 2 semester credits*

72 clinic hours, 2 semester credits

CLINICAL EDUCATION 701/801

Pediatrics

Students perform physical exams, diagnostic assessments and develop treatment programs for pediatric patients under the supervision of licensed health care providers, integrating biomedical science with natural therapeutics. *72 clinic hours, 2 semester credits*

72 clinic hours, 2 semester credits

CLINICAL EDUCATION 702/802

Integrative Oncology

Students learn to approach oncology cases by performing a review of biomedical findings and integrating best practices in natural therapeutics. Students co-manage patients' health-care with their specialists to address their cancer diagnosis and to minimize adverse effects that may arise from their treatment. *72 clinic hours, 2 semester credits*

72 clinic hours, 2 semester credits

CLINICAL EDUCATION 703/803

Generative Medicine

Students learn how to use the methods of network science to understand the complex relationships between individuals, their genetics, the environment, and the molecular basis of disease to develop treatment strategies aimed at optimizing health for each individual patient, utilizing specialized computer tools and a comprehensive knowledge of genetics, pathology, and biochemistry. *72 clinic hours, 2 semester credits*

72 clinic hours, 2 semester credits

CLINICAL EDUCATION 705/805

Mind-Body Medicine

Under the supervision of licensed health care providers, students develop trust, set appropriate boundaries, and using counseling tools, they work with patients by addressing their social and emotional concerns. *72 clinic hours, 2 semester credits*

72 clinic hours, 2 semester credits

CLINICAL EDUCATION 706/806

Physical Medicine

Students perform physical exams, diagnostic assessments, and develop and apply treatment approaches using a variety of therapeutic tools for patients with musculoskeletal concerns. *72 clinic hours, 2 semester credits*

72 clinic hours, 2 semester credits

CLINICAL EDUCATION 708/808

Community Medicine

Students perform physical exams, diagnostic assessments, and develop and apply treatment approaches in a variety of community settings. *72 clinic hours, 2 semester credits*

72 clinic hours, 2 semester credits

CLINICAL EDUCATION 709/809

Women's Health

Students perform physical exams, diagnostic assessments and develop and apply treatment approaches directed at health concerns related to women's health. *72 clinic hours, 2 semester credits*

72 clinic hours, 2 semester credits

CLINICAL EDUCATION 714

Clinic Mentoring

Supervising Clinicians model the process of case-taking and management as students develop physical exam and diagnostic assessment skills, as well as treatment approaches through their increasingly active participation in the patient visit. *72 clinic hours, 2 semester credits*

72 clinic hours, 2 semester credits

CLINICAL EDUCATION 888

Integrative Medicine

This rotation is a collaborative effort of the College of Naturopathic Medicine, the College of Chiropractic, the Acupuncture Institute, and the Fones School of Dental Hygiene. The focus of this rotation is on prevention and improving patients' health globally. Student Clinicians/Supervisors from all four schools interview the patient and write case study reports after each encounter, with the inclusion of evidence-informed clinical practice information in the global assessment. *72 clinic hours, 2 semester credits*

72 clinic hours, 2 semester credits

ELECTIVE COURSES

CLINICAL EDUCATION 821I

Practicum in IV Therapy

The student will learn the indications and contraindications for various IV therapies in the

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naturopathic practice. Preparation and administration (including osmolality) of various IV solutions using proper aseptic techniques will be emphasized. Lectures will be accompanied by hands-on in-class experience. Prerequisites: NCS 623L, must be eligible for clinic entry.

0.5 lecture hour; 1 laboratory hour; 1 semester credit

NATUROPATHIC PRACTICE 712

Generative Medicine I

This course examines the basics of complexity theory and systems biology as applied to naturopathic strategies, in particular the vis medicatrix naturae. Students who wish to qualify for senior shift positions on the Center of Excellence in Generative Medicine (COEGM) Personalized Medicine shifts will be required to take Generative Medicine I. Students who wish to qualify (upon licensure) to sit for the board certification (diplomate) in Personalized Medicine through the AANP affiliated Institute for Naturopathic Generative Medicine are required to take Generative Medicine I and Generative Medicine II. Students who wish to qualify for post-graduate residencies at the COEGM are required to take Generative Medicine I and Generative Medicine II. Pathfinder Scholars are required to take Generative Medicine I and Generative Medicine II.

1 lecture hour; 1 semester credit

NATUROPATHIC PRACTICE 828

Generative Medicine II

This survey course introduces the naturopathic student to the basics of generative medicine as envisioned and practiced at the Center of Excellence in Generative Medicine. Topics include: Advanced network theory, generative molecular biology, computational medicine, information theory and bioinformatics. Students who wish to qualify for senior shift positions on the Center of Excellence in Generative Medicine (COEGM) Personalized Medicine shifts will be required to take Generative Medicine I. Students who wish to qualify (upon licensure) to sit for the board certification (diplomate) in Personalized Medicine through the AANP affiliated Institute for Naturopathic Generative Medicine are required to take Generative Medicine I and Generative Medicine II. Students who wish to qualify for post-graduate residencies at the COEGM are required to take Generative Medicine I and Generative Medicine II. Pathfinder Scholars are required to take Generative Medicine I and Generative Medicine II. Prerequisite: NNP 712

1 lecture hour; 1 semester credit

HOMEOPATHIC MEDICINE 821

Homeopathy IV

In this seminar-style course, students develop

a deeper understanding of homeopathic case-taking, analysis, prescribing and long-term case management strategies. Casework using video recordings, group discussions and computer repertorizations are employed to deepen the student's understanding of case analysis and management of chronic states. Students prepare to incorporate classical homeopathic treatment into their private practices.

Prerequisites: NHM 621, NHM 711, NHM 721
2 lecture hours; 2 semester credits

CLINICAL EDUCATION 861

Externship

Students gain hands-on clinical experience in working with patients under the supervision of a naturopathic physician outside of UB Clinics. The externship experience mimics that of the UB Clinics experience, in that students are actively involved in patient care, participating in the diagnosis and treatment of patients. Pre-requisites: Completion of all Preceptorship hours, and a minimum of 100 hours clinical experience as a Primary Student Clinician in the UB Clinics and Community Clinics.

NATUROPATHIC TRADITIONAL CHINESE MEDICINE 721

NTCM III

Students continue the study of traditional Chinese medicine as it is used in naturopathic practice. Students will practice diagnostic skills using physical examination and the ten questions, and identify patterns of Zang-Fu disharmony. They will learn and practice treatment techniques including needling, moxibustion, electro-acupuncture, acupressure, and cupping. Required for students matriculating in 2017 and later. Prerequisite: NTCM 521.

1 lecture hour; 2 laboratory hours; 2 semester credits

NATUROPATHIC TRADITIONAL CHINESE MEDICINE 722

NTCM IV

Students continue to practice diagnostic skills and treatment techniques. Management of more complex cases will be addressed, including appropriate referrals to TCM specialists, medical doctors, and other healthcare providers. Required for students matriculating in 2017 and later. Prerequisite: NTCM 721

1 lecture hour; 2 laboratory hours; 2 semester credits

Nutrition

Nutritional Science

The following nutritional science courses are offered only in the master's program in Nutrition. This program is available on the main

campus and online.

- 560 A Pathophysiologic Basis of Metabolic Disease
- 560 B Biochemistry of Nutrition
- 560 C Vitamins and Minerals
- 560 E Assessment of Nutritional Status
- 560 D Clinical Biochemistry
- 560 G Lifelong Healing with Food
- 560 H Developmental Nutrition
- 560 I Functional Medicine Nutrition
- 560 F Nutritional Therapeutics
- 560 M Evidence Based Nutrition
- 560 K Virtual Clinic
- 560 P Botanical Medicine

NUTRITION 560A

Path physiologic Basis of Metabolic Disease

A study of the underlying mechanisms of disease and the complex interrelationships between critical systems including respiratory, urinary, cardiovascular, digestive, nervous and endocrine. Lectures will include fluid and electrolyte imbalances, acid and base imbalances, inflammation, hypersensitivity, infection, necrosis, and neoplasms. The influence of various nutrients on systemic function will be stressed. Prerequisite: Anatomy & Physiology I, II, NUTR 560A, 560B, 560C, 560D, 560E, 560F, 560G, 560H, 560I, 560J, 560M, 560P.

4 semester hours

Offered: Twice Annually

NUTRITION 560B

Biochemistry of Nutrition

The course reviews the static and dynamic aspects of the biochemistry of carbohydrates, lipids, amino acids, proteins, nucleic acids, hormones and vitamins in the healthy individual. Cations, anions, enzyme kinetics, and integration and control mechanisms of the various metabolic pathways are discussed. Prerequisite 4 credits of Introduction to Biochemistry or 8 credit of Organic Chemistry.

4 semester hours

NUTRITION 560C

Vitamins and Minerals

The course covers the basic and clinical aspects of nutrient homeostasis with emphasis on vitamin and mineral metabolism at the cellular and tissue level. Lectures will include specific functions, requirements, sources, assay methods, and effects of deficiencies and excesses of vitamins and minerals. Prerequisite: Nutrition 560A and 560B.

3 semester hours

NUTRITION 560E

Assessment of Nutritional Status

Clinical and laboratory procedures for evaluation of nutrient status, including blood and

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other tissue analyses, principles of functional assessment, dietary records, questionnaires, case histories, physical examinations, and anthropometric methods are covered extensively. Prerequisite Nutr 560A and 560B.

3 semester hours

NUTRITION 560D

Clinical Biochemistry

The course encapsulates the biochemistry of disorders arising from acid/base imbalance and the abnormal metabolism of the carbohydrates, lipids, proteins, amino acids, nucleic acids, bile pigments, vitamins and hormones. Inherited disorders of metabolism, the role of enzyme performance in prognosis of biochemical dysfunctions and the meaning and interpretations of clinical laboratory findings both traditional and functional are discussed. Prerequisite Nutr 560A, B, C and E

3 semester hours

NUTRITION 560G

Lifelong Healing with Food

This course will focus on the general knowledge and skills needed to educate nutrition clients about food to facilitate healing. It will teach the landscape of the US food system, menu and recipe planning, multiple food theories, fad and medical diets. Cultural and behavioral perspectives on nutrition will be addressed. Pre-requisite Nutr 560 A B C and E.

4 semester hours

NUTRITION 560H

Developmental Nutrition

Nutritional considerations and health-related concerns throughout the life cycle are explored. Pregnancy, lactation, fetal, infancy, childhood, and adolescent growth and development are addressed in detail, in this context. Also considered is the etiology of nutrition-related disorders of adulthood and the elderly. Prerequisites Nutr 560A, B, C, D and E

3 semester hours

NUTRITION 560I

Functional Medicine Nutrition

This course will teach advanced biochemical assessment using critical analysis of client history with clinical testing from a functional medicine perspective. Functional lab testing will be evaluated in detail with case studies. Topics will be relevant to preventative as well as therapeutic nutrition care. Prerequisites Nutr 560A, B, C, D, E, G.

3 semester hours

NUTRITION 560F

Nutritional Therapeutics

This course will include an understanding of the mechanism of action of various nutritional

interventions, as well as the role it can play in helping to restore wellness. Students will become familiar with common pharmaceutical treatments, and become aware of possible drug-nutrient interactions, as well as drug-induced nutrient depletions. Students will learn how to incorporate nutrition in a complimentary role with conventional treatments. This course will emphasize the importance of incorporating evidence based medicine into nutritional therapeutic decisions. Prerequisites Nutr 560A,B,C,D,E,G,H I.

4 semester hours

NUTRITION 560M

Evidence Based Nutrition.

(Must be taken in online format)

The course describes the analytical approaches for searching and interpreting clinical research data reported in the literature using evidence based practice with emphasis on the application of those data in clinical practice. Biological variation, experimental design, data and fact differences, matching analysis to design, integrity in analysis, and bias in design and analysis are considered in detail. Prerequisites Nutr 560A,B, C,and E

3 semester hours

NUTRITION 560K

Virtual Clinic

(Must be taken in online format)

This final semester course will incorporate critical thinking and scientific knowledge as you complete 4 monthly modules on clinical management online with different instructors. You will learn key skills in assessment, clinical test analysis, designing treatment plans for specific common health conditions, weight loss strategies and how to effectively start and grow your nutrition practice. Synchronous data technology will be used to help you learn real-time with your classmates and instructors. Prerequisites Nutr 560A, B, C, D, E, G, F, H, I and M.

4 semester hours

NUTRITION 560P

Botanical Medicine

A study of the use of herbs in nutritional practice. Lectures include the mechanism of action, pharmacological/toxicological properties, clinical applications, product standardization, and recommended dosage of individual herbs. Prerequisites Nutr 560A, B, C, D, E, G, F, H, I and M.

3 semester hours

ELECTIVE COURSES*

THESE COURSES ARE NOT REQUIRED /ALL ARE OPTIONAL AND IN ADDITION TO REQUIRED COURSES.

NUTRITION 560J

Research in Nutrition

The independent research project is an option in the Human Nutrition program in place of an elective course. The project can take the form of a literature-based study or an original research project. All work must be done by the student. The topic must be approved by the faculty advisor. The project must be completed within one semester following the completion of the core curriculum.

3 semester hours

NUTRITION 560L

Nutrition and Exercise

An instructional class for nutritionists detailing proper protocols for evaluating a client's readiness for exercise, designing a proper exercise/nutrition program with follow up assessments, exercise recommendations for clinical conditions, and enhancing endurance and performance during exercise and sports.

3 semester hours

NUTRITION 560Q

Nutrition and Cancer

This course will provide an understanding of the etiology for cancer from a functional medicine paradigm and current allopathic assessment and treatment options and how to implement nutritional therapy to assist cancer patients undergoing treatment. This course will also teach complementary supplementation strategies, and understanding of the role of diet and lifestyle in prevention of primary and secondary cancer and the establishment of communication skills to enhance collaboration with oncologists. Prerequisites: NUTR 560T 560Q and 560L

3 semester hours

Offered: Annually

NUTRITION 560T

Nutrition and Autism

This course will establish a foundational understanding of what Autism Spectrum Disorder (ASD) is by defining the different conditions within the spectrum, and reviewing the known causes, symptoms, and trends and to acquire a foundational knowledge of the dietary modifications designed to facilitate healing and improve cognitive outcomes and increase overall health and well-being. Course will cover introduction to other biomedical treatments and testing available for ASD.

3 Semester hours

Physician Assistant (MSPA)

PHYSICIAN ASSISTANT 511

Anatomy I with Lab

This course introduces the functional anatomy

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of the human body. Students will have the opportunity to locate, identify, and dissect all major muscular, nervous, vascular, bony, and soft tissue structures using cadaveric specimens.

3 credits

PHYSICIAN ASSISTANT 512

Anatomy II with Lab

This course builds on Anatomy I investigating the functional anatomy of the human body by offering students the opportunity to locate, identify, and dissect all major muscular, nervous, vascular, bony, and soft tissue structures using cadaveric specimens.

3 credits

PHYSICIAN ASSISTANT 521

Physiology I

This course offers fundamental and integrated approach to human physiology and biochemistry starting with basic processes of metabolism and homeostasis including carbohydrate, lipids and protein metabolism, cell cycle and DNA replication, cellular energy production, tissue types and their functions. This course presents an in-depth exploration of the nervous system, musculoskeletal functioning and cardiac physiology.

3 credits

PHYSICIAN ASSISTANT 522

Physiology II

This course builds on MSPA 521 to offer a fundamental and integrated approach to the circulatory, pulmonary, gastrointestinal and endocrine systems. The circulatory system will highlight regulation of local flow, Starling forces equilibrium and function of lymphatics. The pulmonary system will cover ventilation, perfusion and gas exchange processes. The GI system will address details of nutrient digestion, peristalsis, secretion and absorption processes as well as autonomic nervous system impact on regulation of GI tract. The endocrine system will discuss hormones and the types of receptors they affect.

3 credits

PHYSICIAN ASSISTANT 529

Clinical Medicine I

The first of a three-semester series, this course is an organ-systems-based exploration of psychiatric, neurologic, hematologic, and dermatologic diseases, as well as diseases of the head, eyes, ears, nose, and throat. Emphasis is on the integration of anatomy, physiology, pathophysiology, microbiology, history and exam findings and diagnostic procedures in order to formulate a differential diagnosis; on ordering and interpreting diagnostic tests in order to develop a working diagnosis; and on

developing and implementing treatment plans including as needed therapeutic procedures, pharmacology, referral and patient education and counseling.

5 credits

PHYSICIAN ASSISTANT 530

Clinical Medicine II

The second of a three-semester series, this course is an organ-systems-based exploration of cardiac, pulmonic, gastrointestinal genitourinary, endocrine, and renal, diseases. Emphasis is on the integration of anatomy, physiology, pathophysiology, microbiology, history and exam findings and diagnostic procedures in order to formulate a differential diagnosis; on ordering and interpreting diagnostic tests in order to develop a working diagnosis; and on developing and implementing treatment plans including as needed therapeutic procedures, pharmacology, referral and patient education and counseling.

6 credits

PHYSICIAN ASSISTANT 533

Clinical Medicine III

The third of a three-semester series, this course is an exploration of obstetric, gynecologic, pediatric diseases and approaches to the surgical and emergency medicine patient. Emphasis is on the integration of anatomy, physiology, pathophysiology, microbiology, history and exam findings and diagnostic procedures in order to formulate a differential diagnosis; on ordering and interpreting diagnostic tests in order to develop a working diagnosis; and on developing and implementing treatment plans including as needed therapeutic procedures, pharmacology, referral and patient education and counseling.

8 credits

PHYSICIAN ASSISTANT 534

Correlative Medicine I

The first of a two-course series, this course gives students the skills to develop differential diagnoses and patient-centered management plans, as well as write complete medical notes and give oral presentations. Family medicine and psychosocial medicine are aspects of this course.

2 credits

PHYSICIAN ASSISTANT 542

Correlative Medicine II

The second of a two-course series, this case-based course refines the formation of diagnoses and complete management plans of common symptoms. The synthesis of material previously learned in a case-based format refines skills in critical thinking, medical problem solving, the written and the oral presenta-

tion of clinical cases

2 credits

PHYSICIAN ASSISTANT 551

History and Physical Exam I

This course has three aims. First, it helps students develop the skills of obtaining a comprehensive and a problem-focused history. Second, students gain the ability to write a medical note. Last, students learn interviewing techniques and the affective aspects of the medical encounter.

3 credits

PHYSICIAN ASSISTANT 552

History and Physical Exam II

The second course in this series focuses on performing a comprehensive physical examination. This course further emphasizes the integration and interpretation of findings to create a foundation for further clinical evaluation. This course further emphasizes normal versus abnormal findings and on accurate and appropriate documentation.

3 credits

PHYSICIAN ASSISTANT 556

Patient Education, Nutrition and Counseling

This course is an evidence-based approach to educate and counsel patients in order to improve lifestyle, increase adherence and reduce medical errors. This course will emphasize disease prevention, health promotion during various stages of life with emphasis on the nutritional aspect of health.

2 credits

PHYSICIAN ASSISTANT 565

Integrative Medicine and Practice

This course exposes students to the philosophy, practice and techniques utilized in alternative and complementary medicine. The focus of this course is on occupational therapy, physical therapy, Tai Chi, Qi Gong, Yoga, Chiropractic techniques and Massage Therapy Ayurveda, Traditional Chinese Medicine, Acupuncture, Naturopathic medicine, Homeopathy, Hypnotherapy. Students have an opportunity to experience some of the modalities, such as Yoga or Massage Therapy, in guided exercise classes.

2 credits

PHYSICIAN ASSISTANT 574

Medical Ethics & Professional Practice

This course presents the student with the four-topic method of evaluation of ethical issues. Student examine ethical issues in terms of medical indications, patient preferences, quality of life and contextual features to provide a response to the ethical dilemma. Additionally, this course incorporates the history, develop-

Physician Assistant

ment, certification and licensure process of the PA profession. PA web sites and professional organizations. Special topics include risk management, professional liability, and, patient safety. Billing, reimbursement, and the organization of healthcare in the US and in other countries are also explored.

2 credits

PHYSICIAN ASSISTANT 575

Global & Preventive Health

This course offers the student the opportunity to investigate the impact of health issues in other countries and the interactive effect on all populations in terms of epidemiology, disease, disasters, economics, health initiatives, ethics and policy.

2 credits

PHYSICIAN ASSISTANT 581

Pharmacology I

This course introduces the student to the basic principles of pharmacology, including mechanisms of action; absorption, distribution, metabolism, and excretion; pharmacokinetics; interactions with other drugs and with food; problems with special populations (prenatal, neonatal, the elderly); rational drug usage for clinical disorders (therapeutics); clinical measures; and toxicology.

3 credits

PHYSICIAN ASSISTANT 582

Pharmacology II

This course builds on Clinical Pharmacology I with more advanced principles of pharmacology, including mechanisms of action; absorption, distribution, metabolism, and excretion; pharmacokinetics; interactions with other drugs and with food. A presentation of drug classes as they relate to the different organ systems includes anticipated results and adverse reaction monitoring.

3 credits

PHYSICIAN ASSISTANT 591

Technical Skills

The demonstration and practice of technical procedures frequently encountered in primary care, emergency medicine, and surgical settings are explored in this course. The emphasis is on such skills as intravenous cannulization, suturing, urethral catheterization, splinting and casting incision and drainage and nasogastric lavage.

2 credits

PHYSICIAN ASSISTANT 602

Information Literacy and Medical Writing

This course develops the ability to identify a clinical problem and to collect, process, analyze, summarize and present an evidence-

based approach solution to that problem. The topic can be a medical challenge in terms of diagnosis or treatment of a disease state, or management issues for patients or their family's issues of which there is lack of consensus or a lack of clear guidelines.

2 credits

PHYSICIAN ASSISTANT 651

Internal Medicine Rotation

This six-week clerkship provides direct patient care experiences in the in-patient setting. Under the direction of board-certified internists, students learn to evaluate and formulate treatment plans for patients with a wide variety of adult illnesses. Emphasis of this clerkship is on critical thinking skills, synthesis of pertinent clinical information, the presentation of problem-oriented patient data, indications for and interpretation of laboratory studies, and competence in clinical procedures.

5 credits

PHYSICIAN ASSISTANT 652

Pediatrics Rotation

This six-week clerkship explores the care of children from birth through adolescence. Acute illness, developmental delay, genetic abnormalities, psychosocial issues and preventive medicine are explored.

5 credits

PHYSICIAN ASSISTANT 653

Surgery Rotation

This six-week clinical experience focuses on the care of the surgical patient in the pre-operative, operating room and post-operative settings. Determination of surgical diagnoses and immediate management of life-threatening conditions are stressed.

5 credits

PHYSICIAN ASSISTANT 654

Emergency Medicine Rotation

This six-week clerkship provides opportunities to evaluate and treat patients with urgent and emergent medical complaints under the supervision of an emergency medical physician. The care of patients with life-threatening illness as well as patients seen in the sub-acute "fast track" are emphasized.

5 credits

PHYSICIAN ASSISTANT 655

Obstetrics/Gynecology Rotation

Experiences in the full range of woman's health issues throughout the reproductive and post-menopausal years are offered in this six-week clerkship, including participation in common gynecological surgical procedures and assisting in labor and delivery. Students learn to provide pre- and post-partum care

and family planning as well.

5 credits

PHYSICIAN ASSISTANT 656

Family Medicine Rotation

Students work with board-certified family physicians and general internists to evaluate, diagnose and treat patients of all ages with a wide variety of illness in this six-week clerkship. Emphasis is on health care delivery in the outpatient setting, health promotion, preventive medicine and the patient-centered medical home.

5 credits

PHYSICIAN ASSISTANT 657

Psychiatry Rotation

The diagnosis, treatment and management of patients with psychiatric illness in the in-patient, outpatient and emergency settings are stressed in this six-week rotation. This clerkship requires students develop and demonstrate a variety of skills under the supervision and guidance of an experienced psychiatric practitioner.

5 credits

PHYSICIAN ASSISTANT 658

Elective Rotation

This six-week experience offers the opportunity to explore a discipline of interest in depth. Students are responsible to enhance their understanding of this discipline through by self-motivation.

2 credits

PHYSICIAN ASSISTANT 661

Capstone Project I

This first part of a two-course series guides students through the selection of a capstone topic, conducting a complete literature search, and devising a plan to collect data. The data collection will continue, with faculty mentorship, through the clinical

4 credits

PHYSICIAN ASSISTANT 662

Capstone Project II

This course is the second part of the Capstone Project experience. Students will continue the work begun on the projects in semester 6 in MSPA 698 Capstone Project, drawing on skills gained in MSPA 605 Information Literacy and MSPA 647 Research Methods. This course has the added requirement of presenting the project either in poster or presentation form to the program faculty.

2 credits

PHYSICIAN ASSISTANT 671

Research Methods

This course provides a foundation in quanti-

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tative and qualitative research and evaluation methods appropriate for health professionals. Students will develop competencies in working with communities to identify and understand health related conditions and will be able to evaluate interventions and health outcomes.

2 credits

PHYSICIAN ASSISTANT 695

Graduate Logistics

This course presents a complete review of clinical medicine in preparation for the summative examination. This course helps students identify content weaknesses. Program resources can best aid students to complete their study and prepare for the NCCPA certifying exam.

1 credit

**All students are required to complete all of the seven core supervised clinical clerkships. The clinical clerkship sequence will be individually assigned to students.*

Statistics

STATISTICS 400

Statistics and Quantitative Analysis

This course is an introduction to basic statistical methodology and its applications to business decisions. Topics include probabilities, discrete and continuous probability distributions, probability sampling techniques, sampling distributions, interval estimation and hypothesis testing. The basics of specific statistical tests will be presented including chi square, correlation, multiple regression and analysis of variance. Students will use software packages to perform statistical analysis. Prerequisite: Admission to graduate study.

3 semester hours

Technology Management

TECHNOLOGY MANAGEMENT 400

Marketing, Entrepreneurial and Innovation Issues and Practices in Management

This course focuses on strategic marketing, entrepreneurial, intrapreneurial and innovation issues, opportunities and best practices in helping organizations grow in a complex global environment. which have emerged in the last few years such as the growing importance of strategic marketing, voice of the customer, customer service and innovation in helping companies grow as well as achieve and sustain competitive advantage. The business impact of new technologies which enable marketing

and innovation are covered. The course also examines the principles of entrepreneurship and intrapreneurship in developing new products, services and processes. In addition to individual assignments, students are assigned to team projects to develop product or service market plans either for start-up businesses or within the context of a corporate venture. Prerequisite: Admissions to graduate studies. 3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 410

Survey of Technology

The course provides an introduction into managing engineering and technology projects and surveys, the history, current and emerging technologies in the areas of: health/medicine and biotechnology; materials, energy, environment; electronics, computing and the Internet; nanotechnology, transportation; structures, transit; infrastructure, security, manufacturing, systems processes and aerospace.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 495

Contemporary Issues in Communications and Research

The course is designed to help students improve their communications (e.g. oral, written, and formal presentation) skills and research methods and techniques used in business, technology and engineering disciplines.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 500

Graduate Co-Op/Internship in Technology Management

Students will work for a company in a role that is appropriate for an MS - TM graduate, or near graduation. Through this experience students will apply management principles and theory in a practical setting. The student will write a paper summarizing the tasks and accomplishments encountered within the organization, as well as make managerial recommendations for improvement of the company, or division in which s/he was employed. Prerequisite: Final semester of study and the Director, TM Program approval.

1-3 semester hours

TECHNOLOGY MANAGEMENT 505 (TCMG 505/MGMT 555)

Global Program and Project Management

This course focuses on the managerial aspects of how to more effectively manage, plan and execute programs/projects with a focus on high quality deliverables arriving on time, within budget, within scope and to the customer's satisfaction. Areas covered will include program and project management life cycle phases, executive sponsorship, portfolio

investment management selection and prioritization, requirements, scope and project charters, planning, development, estimating, staffing, leadership, scheduling, risk management, change management, project metrics, vendor integration and management and other related topics. This course is based on current and emerging best practices and principles. It will also discuss PM certification requirements and provide real world case studies. Prerequisite: TCMG 484.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 506 (TCMG 506)

Advanced Program and Project Management

This is an advanced course in Global Program and Project Management. It covers the Project Management Institute's Knowledge and Process areas and prepares students to take various PMI Project Management Certification. Prerequisite: TCMG 505.

3 semester hours

TECHNOLOGY MANAGEMENT 508 (TCMG 508/MKTG 560)

Foundations of Project Management

This course covers new product development, innovation and commercialization, as well as the product management life cycle. Topics covered include the feasibility and investment prioritization of new products or product enhancements, raising capital for new product development, market and customer needs analysis, make versus buy alternatives and product launch and commercialization issues and considerations, including promotion, pricing, distribution, competition, pre and post sales support, systems and infrastructure support, customer service and related areas. Students will work on individual and team projects that will include the development of a new product market/business plan. Prerequisite: TCMG 400.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 512 (TCMG 512/MGMT 590)

Intellectual Property Management

Protection of a business' intellectual property assets can make the difference between success and failure. This course will discuss the strategies and methods available for protection of intellectual property in the global environment. Students will work through the American patent, copyright and trademark processes, including how to prepare and file applications for each. Students completing this course should be able to pass the Patent Agent exam. Global business issues, such as protection of ideas in an off-shoring arrangement, IP co-development and other issues, will also be addressed. Prerequisite: TCMG 490 or Direc-

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tor, TM program approval.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 520 (TCMG 520)

Information Systems Development & Design

A course in the analysis, design, and development of business systems. Students will learn a variety of development models and tools available for systems development, deployment and management. The role of all systems constituents is addressed through discussion of the specification, decision-making, and review of designs, documentation, program specifications, and system improvement. Course level and content is suitable for managerial as well as the more technically oriented. Prerequisites: ITIS 400 or Director, TM program approval.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 523 (TCMG 523/MGMT 523)

Leadership, Teams & Managing Change

This course focuses on the development of leadership skills important in the effective management of change. Through role-playing exercises, videotapes, diagnostic tools, seminar discussion, selected readings, and a group project, students will learn theory and build interpersonal skills necessary for providing leadership in diverse multicultural groups and organizations. The course will address the managerial issues present in organizations undergoing accelerating change and adopting a culture of creativity. Creating and sustaining high performance multi-cultural and interdisciplinary traditional and virtual teams is covered. Prerequisite: Admissions to graduate studies.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 524

Statistical Quality Control Techniques

This course presents a comprehensive summary of methods for managing quality and continuous process improvements. The course objective is to develop an operational familiarity with contemporary methods found to be effective. Topics covered include statistical process control, quality function deployment, concurrent design, the house of quality, the Taguchi method, Six Sigma, lean and others. It also covers continuous process improvement methodologies and techniques. This course is intended for those students who do not plan to specialize in quality management. Prerequisite: Admissions to graduate studies.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 525 (TCMG525)

Finance and Accounting for Managers

This course provides managers with the skills required to read, interpret and apply information about an organization's financial position.

Managerial accounting and finance concepts will be presented, followed by financial statement analysis. Topics presented from a managerial perspective will include how accounting data is generated during business operations, how financial statements are created and analyzed, management of finance to maximize return on investment and stakeholder equity and other related topics. Students will be required to participate in case work applying the principles presented in the class. Prerequisite: Admissions to graduate studies.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 530 (TCMG 530/MEEG 530)

Foundations of Manufacturing Management

The objectives of the course are to understand and apply concepts and techniques in manufacturing management. The course includes the management of people (both traditional and high performance systems and teams), lean manufacturing techniques as used on the factory floor, and recent concepts such as Factory Physics. The course focuses on those issues that are important in supervising and managing a modern manufacturing operation. Prerequisites: graduate standing.

3 semester hours

TECHNOLOGY MANAGEMENT 532 (TCMG 532/MKTG 550)

Global Market Management

Strategy planning, implementation and control for market entry and development. Topics include social, political and economic changes affecting marketing opportunity; focused versus dispersed marketing efforts; marketing in developed and undeveloped countries; and marketing systems required for the various strategic alternatives. Prerequisite: TCMG 400.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 533 (TCMG 533)

Information Technology Strategy and Governance

This course covers information technology plans, strategy, business/IT alignment, governance, environmental, ethical, economic, regulatory, compliance and technical issues and trends with a focus on planning, organizing, justifying, controlling, implementing and integrating concepts and real world experiences. It discusses business and IT balanced scorecards, metrics and key performance indicators. Current and emerging best business and technology strategy and governance best practice frameworks such as COBIT, CMMI, PMBOK, Kano, VOC, QDF, ITIM, Prince2, ITIL, select ISO standards and others will be covered with emphasis on lessons learned, critical success factors and pragmatic solutions. Individual and team projects and case studies are integrated

into the course. Prerequisite: ITIS 400 or Director, TM program approval.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 534 (TCMG 534/MGMT 535)

Strategic Sourcing and Vendor Management

This course covers the rewards and risks of outsourcing and vendor management and identifies where outsourcing should be used and not used. The objectives of the course are to help students understand how to plan, direct, manage and more effectively participate in outsourcing initiatives in terms of the feasibility of outsourcing (off-shore, near-shore, rural-shore, best shore), vendor selection, contract negotiation, vendor management and evaluation, risk assessment and terminating outsourcing deals. Prerequisite: TCMG 523 and TCMG 505 or Director, TM program approval.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 535 (TCMG 535/BMEG 535)

Foundations of Bio Tech Sciences and Management

This course covers the comprehensive scope of knowledge of major issues and technologies in the bio technology field. This includes regulatory, robotic, imaging, cybernetics, bio-informatics, genetics, ethics and related areas. Individual and team projects will be assigned. Prerequisite: Admissions to graduate studies.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 540

Advanced Simulation and Modeling Techniques

The purpose of this course is to provide an in depth coverage of the use of simulation and modeling as an analysis tool for the study of production and distribution processes. The course aims to develop a sense of critical thinking, learning and problem solving. Topics include: problem formulation, data collection and analysis, random variable generation, and statistical analysis of output. Utilizes a major simulation language, SIMAN.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 546 (TCMG 540/MEEG 540)

Simulation and Modeling Techniques

The course covers the concepts and methods that will assist engineering and technology managers and professionals to make alternative investment and funding decisions regarding projects, programs, products, business expansion and other alternatives using the financial calculations involving time value of money (IRR, ROI, NPV), uncertainty and risk. Topics include engineering and related financial evaluation techniques and formulas, choosing among alternatives, sensitivity analysis, economic analysis, opportunity costs, depreciation,

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amortization, probability, cost estimating and systems and others. Prerequisites: TCMG 484.
3 semester hours

TECHNOLOGY MANAGEMENT 556 (TCMG 556/MKTG 552)

Services Marketing

The course addresses the unique problems of marketing intangibles in the broad spectrum of service industries. The course focuses on the development, implementation and control of strategy, systems and people for effective service operations. This is a case study course. Prerequisite: TCMG 400.

3 semester hours; 3 semester hours

TECHNOLOGY MANAGEMENT 557 (TCMG 557/ITIS 557)

Infrastructure Systems

This course covers the fundamentals of data networking, including signaling, routing and technologies underlying the explosive growth of e- and m-commerce. The managerial issues relevant to network utilization, security and service delivery will be addressed as the underlying communications technologies are discussed. Prerequisite: ITIS 400.

3 semester hours; 3 semester hours

TECHNOLOGY MANAGEMENT 560 (TCMG 560)

Foundations of Environmental and Energy Management

This course covers the assessment of current and potential environmental and energy management issues, opportunities and threats. Key issues such as global warming, pollution, global energy supply and demand needs will be discussed. Alternative energy sources are reviewed, including examination of energy technologies in each fuel cycle stage for fossil (oil, gas, synthetic), solar, biomass, wind, hydro, nuclear, and geothermal energy types, along with storage, transmission, and conservation issues. Prerequisite: Admission to graduate studies.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 561 (TCMG 561)

Economic, Regulatory, Cultural, and Societal Issues in Environment and Energy Management

The course will focus on a review of the environmental and energy management safety, hazard identification and disaster prevention policies, laws, concepts and issues. U.S. and international laws, regulations and standards will also be covered. The course will provide the student with a better understanding of how the complexity of this topic impacts economic, political, cultural and societal and opportunities in environment and energy management. Prerequisite: TCMG 560.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 570 (TCMG 570/MGMT 570)

Foundation of Health Care Management and Administration

This course focuses on a systematic exploration of the health care system in the United States, government interactions and regulations, delivery systems, healthcare insurance and financing, health care providers, innovations in healthcare services and alternative strategies. Prerequisite: TCMG 523.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 571 (TCMG 571/MGMT 571)

Foundations of Service Management and Engineering

With the rapid growth of the services industry, this course integrates topics from economics, engineering, law, technology and organizational theory to deal with how firms change over time to become more service oriented or become service business and the mechanisms and tools by which they seek innovation and competitive advantage in the service sector. The services life cycle is reviewed. In addition, enabling technologies and how different disciplines help to answer questions about how business services combine, evolve, standardize and mature are covered. Prerequisite: Admissions to graduate studies.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 572 (TCMG 572/MEEG 572)

Production Technology and Techniques

This course will introduce up-to-date technology, techniques and systems of the global manufacturing industry. American manufacturing situation would be analyzed and Japanese manufacturing success is also explored. Comprehensive and readable description of manufacturing practice is researched.

3 semester hours

TECHNOLOGY MANAGEMENT 573 (TCMG 573/MEEG 573)

Supply Chain Management

The goal of this course is to cover not only high-level supply chain strategy and concepts, but also to give students a solid understanding of the analytical tools, to understand supply chain design, planning and operation and how it impacts the performance of a firm. It also conveys how supply chain drivers used on a conceptual level during supply chain design and operation lead to performance improvements. Prerequisite: Admissions to graduate studies.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 574 (TCMG 574/MEEG 574)

Principles of Logistics and Materials Management

This course presents materials management,

logistics theory and concepts in today's manufacturing and commercial environments. It integrates all of the functional areas of the business as well as incorporating logistics into corporate operation. They are examined in light of how they interrelate with other functions for the firms. Prerequisite: ENGR 111, ENGR 300 and Admissions to graduate studies.

3 lecture hours; 3 semester hours

TECHNOLOGY MANAGEMENT 595

Technology Business Strategy (Capstone Course)

This course is a capstone course dealing with the development and implementation of a business strategy and plan within a framework of ethical decision-making, globalization and managing accelerating change. It tests the capability of the student to apply all prior learning to solve actual strategic management problems.

3-6 semester hours

TECHNOLOGY MANAGEMENT 597AB

Master's Project

A capstone course dealing with the development and implementation of business strategy and plan within a framework of ethical decision-making, globalization and managing accelerating change. It tests the capability of the student to apply and integrate all prior graduate learning to solve actual strategic management problems, develop a business plan and conduct organizational performance and governance assessments. The final project of this course is project-based and shall constitute, therefore, an outcome assessment of what the student has learned in the MS - TM program. Prerequisite: Final semester for completion of MS - TM Program

3-6 semester hours

TECHNOLOGY MANAGEMENT 597 C

Masters Project (Completion)

Topics to be arranged. Prerequisite: Approval of the Director, TM Program.

1 semester hour

TECHNOLOGY MANAGEMENT 598

Thesis in Technology Management

Completion of a report based on field, library and institutional research to demonstrate ability to conduct investigations in a technology management discipline. Approval of the Director, TM Program.

3- 6 semester hours

TECHNOLOGY MANAGEMENT 599

Independent Study in Technology Management

This course is reserved for a special project that cannot be done any other way and to help a student complete the MS when no other alternative is available. Prerequisite: Ap-

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approval of the Director, TM Program.
3 semester hours

TECHNOLOGY MANAGEMENT 645 **Technology New Venture Creation**

This course is for graduate students interested in starting a technology venture, joining a small firm intent upon rapid growth, or pursuing a career in consulting, venture capital, or the management of a technology business or venture for larger companies. The course will provide an opportunity to identify and analyze new business and technology venture issues and opportunities. Select topics covered include: evaluating market opportunities, designing profitable business models, producing a solid business plan, raising capital (multiple rounds), protecting intellectual property and exit strategies such as a merger, the sale of the company or an initial public offerings (IPO). Prerequisites: TCMG 400.
3 semester hours

TECHNOLOGY MANAGEMENT 645 **Technology New Venture Creation**

This course is for graduate students interested in starting a technology venture, joining a small firm intent upon rapid growth, or pursuing a career in consulting, venture capital, or the management of a technology business or venture for larger companies. The course will provide an opportunity to identify and analyze new business and technology venture issues and opportunities. Select topics covered include: evaluating market opportunities, designing profitable business models, producing a solid business plan, raising capital (multiple rounds), protecting intellectual property and exit strategies such as a merger, the sale of the company or an initial public offerings (IPO). Prerequisites: TCMG 400.
3 semester hours

Technology Management (Ph.D.)

Doctoral Seminars

These courses are designed for doctoral students only. (TMPD= Technology Management Ph.D. course)

TECHNOLOGY MANAGEMENT 620X **Strategic Management of Technology and Innovation**

This course presents a coherent process for the formulation, implementation, and assessment of technology strategy. This includes the technology life cycle of birth, growth, maturation, and decline of business innovation. Technology management and innovation are studied

within a strategic management perspective. Methods of technology planning, strategic management and forecasting for use in technology intensive organizations are discussed, including strategies for commercializing products.
3 semester hours

TECHNOLOGY MANAGEMENT 645 **Technology New Venture Creation**

This course is for graduate students interested in starting a technology venture, joining a small firm intent upon rapid growth, or pursuing a career in consulting, venture capital, or the management of a technology business or venture for larger companies. The course will provide an opportunity to identify and analyze new business and technology venture issues and opportunities. Select topics covered include: evaluating market opportunities, designing profitable business models, producing a solid business plan, raising capital (multiple rounds), protecting intellectual property and exit strategies such as a merger, the sale of the company or an initial public offerings (IPO).
3 semester hours

TECHNOLOGY MANAGEMENT 694 **Written/Oral Comprehensive Examination**

Students taking comprehensive Ph.D. examinations are required to register for (TMPD)* 694.
0 semester hours

TECHNOLOGY MANAGEMENT 698 **Teaching Requirement**

Ph.D. students assigned to teach courses to fulfill the teaching practicum of the Ph.D. in Technology Management are required to register for (TMPD) 698.
0 semester hours

TECHNOLOGY MANAGEMENT 699 **Seminar (Oral Defense of Dissertation Proposal (Oral Defense))**

This course is a zero credit course. It involves attending the regular departmental seminars and presenting one's work in one of the seminars.
0 semester hours

TECHNOLOGY MANAGEMENT 702 **Explorations in Research Methodologies**

This course exposes students to a wide variety of research approaches across many disciplines. Explores the processes and problems of designing and conducting various kinds of research. Develops skill in evaluating TM research. Through a series of guest researchers, enables students to discuss research process and publication issues with experts. Explores the non-statistical issues in research planning and execution. Develops understanding and

skill in the scientific approach, problem definition, hypothesis development, research design and methodology planning.
3 semester hours

TECHNOLOGY MANAGEMENT 704 **Research, Design, Data Analysis and Measurement**

This course covers techniques such as measurement approaches, scale construction, interview procedures, questionnaire design, secondary sources, observational capability, content analysis, and experimental design. Explores problems of assessing reliability and validity of research findings. Explores the selection and application of statistical procedures for analyzing data to reach significant conclusions and avoid erroneous conclusions through application of statistical techniques such as correlation analysis, multiple regressions, analysis of variance, cluster analysis, discriminate analysis, conjoint analysis and others. Develops criteria for selecting appropriate procedures to assess the statistical properties of data sets. Prerequisite: TMPD 702
3 semester hours

TECHNOLOGY MANAGEMENT 706 **Quantitative Methodologies**

This course provides the mathematical and statistical preparation to support subsequent doctoral course work within the Technology Management department and prepare the student to apply quantitative methods and data analysis techniques. Topics include probability, statistics, measurement and evaluation, sampling, designing studies, linear algebra, linear programming, optimization, simulation, and modeling and regression analysis. Students make extensive use of leading-edge industry software packages.
3 semester hours

TECHNOLOGY MANAGEMENT 710 **Ph.D. Dissertation**

This course is the Ph.D. Dissertation. The student is expected to work on the accepted topic and come up with original results. S/he has to report the results in the form of a Ph.D. dissertation. The student is encouraged to document the intermediate results in the form of reports. S/he is also encouraged to publish these results as they are discovered, in the international professional literature, i.e., refereed conference proceedings and journals. Proof of good work is the acceptance of the results by reputable journals. Intermediate results can also be discussed in departmental seminars. The completed dissertation must be distributed to the dissertation committee mem-

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bers at least two weeks before the dissertation defense. The committee will read it and certify that the dissertation is a work of substantial merit and that it can be defended. It is the responsibility of the student that the final draft of the dissertation addresses all legitimate concerns of the committee members.

Minimum of 15 semester hours

Area 1: New Technology Venture Creation Electives

It is assumed that individuals taking this focus area will have the appropriate academic and business/industrial background. Those people not having the needed background will be responsible for taking necessary prerequisite courses, which will not count toward the minimum classroom hours required for the Ph.D. degree.

TECHNOLOGY MANAGEMENT 505 (TCMG 505/MGMT 555)

Global Program and Project Management

This course focuses on the managerial aspects of how to more effectively manage, plan and execute programs/projects with a focus on high quality deliverables arriving on time, within budget, within scope and to the customer's satisfaction. Areas covered will include program and project management life cycle phases, executive sponsorship, portfolio investment management selection and prioritization, requirements, scope and project charters, planning, development, estimating, staffing, leadership, scheduling, risk management, change management, project metrics, vendor integration and management and other related topics. This course is based on current and emerging best practices and principles. It will also discuss PM certification requirements and provide real world case studies.

3 semester hours

TECHNOLOGY MANAGEMENT 506 (TCMG 506)

Advanced Program and Project Management

This is an advanced course in Global Program and Project Management. It covers the Project Management Institute's Knowledge and Process areas and prepares students to take various PMI Project Management Certification. Prerequisite: TCMG 505

3 semester hours

TECHNOLOGY MANAGEMENT 508 (TCMG 508 / MGMT 565)

Foundations of Product Management

This course covers new product development and innovation, as well as the product management life cycle. Topics covered include the feasibility and investment prioritization of new products or product enhancements, raising

capital for new product development, market and customer needs analysis, make versus buy alternatives and product launch and commercialization issues and considerations, including promotion, pricing, distribution, competition, pre and post sales support, systems and infrastructure support, customer service and related areas. Students will work on individual and team projects that will include the development of a new product market/business plan.

3 semester hours

TECHNOLOGY MANAGEMENT 512 (TCMG 512 / MGMT 590)

Advanced Intellectual Property Management

This course will discuss the strategies and methods available for protection of intellectual property in the global environment. Students will work through the American patent, copyright and trademark processes, including how to prepare and file applications for each. Students completing this course should be able to pass the Patent Agent exam. Global business issues, such as protection of ideas in an offshoring arrangement, IP co-development and other issues, will also be addressed. Students will understand that the protection of a business' intellectual property assets can make the difference between success and failure.

3 semester hours

TECHNOLOGY MANAGEMENT 523 (TCMG 523/MGMT 523)

Leadership, Teams & Managing Change

This course focuses on the development of leadership skills important in the effective management of change. Through role-playing exercises, videotapes, diagnostic tools, seminar discussion, selected readings, and a group project, students will learn theory and build interpersonal skills necessary for providing leadership in diverse multicultural groups and organizations. The course will address the managerial issues present in organizations undergoing accelerating change and adopting a culture of creativity. Creating and sustaining high performance multi-cultural and interdisciplinary traditional and virtual teams is covered.

3 semester hours

TECHNOLOGY MANAGEMENT 525 (TCMG 525)

Finance and Accounting for Managers

This course provides managers with the skills required to read, interpret and apply information about an organization's financial position. Managerial accounting and finance concepts will be presented, followed by financial statement analysis. Topics presented from a managerial perspective will include how accounting data is generated during business operations, how financial statements are created and analyzed, and management of finance to maxi-

mize return on investment and stakeholder equity and other related topics. Students will be required to participate in case work applying the principles presented in the class.

3 semester hours

TECHNOLOGY MANAGEMENT 532 (TCMG 532/MKTG 560)

Global Market Management

Strategy planning, implementation and control for market entry and development. Topics include social, political and economic changes affecting marketing opportunity; focused versus dispersed marketing efforts; marketing in developed and undeveloped countries; and marketing systems required for the various strategic alternatives.

3 semester hours

TECHNOLOGY MANAGEMENT 559 (TCMG 559/MGMT 560)

Foundations of Business Process and Operations Management

The nature of any organization is to provide products and services. At the heart of such provision is the operations management function, which can account for 60% to 75% of an organization's operating costs, investment and assets. Consequently the operations management role is challenging and dynamic, ranging from short-term control to long-term planning activities. Indeed due to the critical nature of the operations management function it is highly visible and exposed to scrutiny, more so than any other function of an organization. Therefore, if you want a career which is demanding and stimulating, as well as knowing that you are contributing to the success of an organization, the Operations & Business Management course can provide you with the perfect launch pad.

3 semester hours

TECHNOLOGY MANAGEMENT 582 (TCMG/MGMT 582)

Small Business and Entrepreneurship

This course provides a comprehensive review of the marketing, operational, financial, product, service and business strategy and plans that must be mastered and developed as foundation for start-up of a small business or entrepreneurship enterprise. In addition, the growth of existing business, through Intrapreneurship, is also covered. Students are required to develop a comprehensive business plan for a business of their own choice and which is acceptable to the instructor.

3 semester hours

TECHNOLOGY MANAGEMENT 580 (TCMG 580X/MGMT 585X)

New Product Commercialization

The objectives of the course are to understand and apply concepts and techniques of product commercialization. The course focuses on

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taking student created product concepts and having student teams drive the concepts to become actual products. Product design, prototype creation, market analysis, and financial analysis all come together within the student team to create a viable product.

3 semester hours

TECHNOLOGY MANAGEMENT 595 (TCMG 595)

Technology Business Strategy (Capstone/Course)

This course is a capstone course dealing with the development and implementation of a business strategy and plan within a framework of ethical decision-making, globalization and managing accelerating change. It tests the capability of the student to apply all prior learning to solve actual strategic management problems.

3 semester hours

Area 2: Select Current Emerging Technologies (Technology Specializations)

Bio-Technology and Bio-Medical Technology, Systems and Processes

It is assumed that individuals taking this focus area will have the appropriate academic and business/industrial background. Those people not having the needed background will be responsible for taking necessary prerequisite courses, which will not count toward the minimum classroom hours required for the Ph.D. degree. Students are expected to have a working knowledge of statistics, biology and chemistry.

BIOMEDICAL ENGINEERING 508 (BMEG 508/MEEG 508)

Biomechanics

Biomechanics is the application of mechanical principles to living organisms that included bioengineering, research and analysis of mechanism in living organisms, and application of engineering principles to and from biological systems. This course can be carried forth from the molecular level including collagen and elastin, all the way up to the tissue and organ levels. Some simple applications of Newtonian mechanics can supply approximations on each level, but precise details demand the use of continuum mechanics.

3 semester hours

BIOMEDICAL ENGINEERING 510 (BMEG 510/ELEG 510)

Medical Machines

This course provides a very good introduction and understanding of Electrical Safety, Medical electronics and Medical Machines, as applica-

ble. Students often have different backgrounds and levels of understanding of technical concepts; therefore, we will develop the necessary background in this course in first few weeks and gradually move from basic to advance topics as listed below in "Class Topics" section. This course will further help by developing an approach to design devices and safety features. Behind every invention, law or device, there is always a need, a necessity. Students go from necessity to invention in the class since a large number of electronic equipment are being used in hospitals and medical centers for patient care and diagnosis or to carry out advanced surgeries. This course will enable students to learn the basics principles of different instruments used in medical science.

3 semester hours

BIOMEDICAL ENGINEERING 513 (BMEG 513/ELEG 513)

Biomedical Image Processing

This course is an elective course. The content of this course include the fundamentals of Digital Image Processing and its applications in biomedical field. Sampling and Quantization of signals are mentioned in order to introduce the digital images, some basic relationship between pixels are mentioned. Introduction to Fourier Transformation, Discrete Fourier Transform and Fast Fourier Transformed are explained. MATLAB programming with Image Processing Toolbox will be introduced to empathize and rigid the understanding of students. Others important fundamental theorems, e.g., Image Enhancement, Image Segmentation, Representation and Description are also mentioned. Students are required to implement some programs using the theorems learnt in classes.

3 semester credits

TECHNOLOGY MANAGEMENT 535 (TCMG 535/BMEG 535)

Foundations of Bio Tech Sciences and Management

This course covers the comprehensive scope of knowledge of major issues and technologies in the bio technology field. This includes regulatory, robotic, imaging, cybernetics, bioinformatics, genetics, ethics and related areas. Individual and team projects will be assigned.

3 semester hours

BIOMEDICAL ENGINEERING 547 (BMEG 547/ELEG 547)

BioMEMS

This course will introduce to students the fundamentals of BioMEMS, the application of MEMS (Microelectromechanical Systems) for biological applications. The topics include microfabrication, microfluids, biosensors, actuators, micro/nano drug delivery systems, micro total analysis systems and lab-on-a-chip

devices, and detection and measurement systems. The main focus is to understand the fundamental challenges and limitations involved in designing and fabricating various BioMEMS and BioNEMS devices

3 semester credits

TECHNOLOGY MANAGEMENT 555X (TCMG 555/BMEG 555X)

Biotechnology and Entrepreneurship

The course examines the principles of bio-entrepreneurship in developing new products, services and processes. Students will learn about the biotechnology dynamics at the global scale in the biomedical drug, diagnostic, hospital management, and devices industries and their markets. Deliverables include homework, assignments, an academic report and a team project. This course provides students with the skills required to read, interpret and apply academic literature, how to identify, extract and understand important information that is useful in the bioentrepreneurial decision making processes. Students will be required to participate in case work applying the principles presented in the class. 3 Semester hours

3 semester hours

BIOMEDICAL ENGINEERING 562 (BMEG 562/ELEG 562)

Nanofabrication with Soft Materials

This is an advanced level graduate course focusing on fabrication of soft materials. Nanofabrication processes and nanosystem products will be discussed. Fundamentals associated with chips fabrications and linking them toward soft materials assembly will be detailed. Emerging nanotechnology based methods for soft and green electronics, mechanical parts, MEMS, PCBS will be covered. Gene chip, label free sensory assay using micro and nanofluidics will be discussed. Transfer printing, DNA-protein interactions using the chip and several nano-scale assemblies for soft materials fabrication will be discussed.

3 semester credits

BIOMEDICAL ENGINEERING 563 (BMEG/MEEG 563)

Polymer Nanocomposites

A great deal of emphasis is put on you getting exposure to the growing field of nanocomposite materials and their biomedical engineering applications. This exciting field is constantly evolving. New composite materials are always being developed and their commercial impact is beginning to be seen. Hence many biomedically relevant nanocomposites such as biogels, bones, cartilages etc and their bioinspired analogs will be covered. The processes pertaining to in-situ and ex-situ nanocomposites, many antibacterial nanoparticle syntheses and their use

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in devise will be covered in detail. Students will learn the structure and properties of polymers. Polymer-carbon nanotube, polymer-graphene and polymer-nanoparticle based nanocomposites will be discussed. Design and development of mechanical, thermal, electronic and multifunctional nanocomposites are their direct and indirect interfaces with natural and synthetic biological structures will be discussed.
3 semester hours

BIOMEDICAL ENGINEERING 565 (BMEG 565/ELEG 565)

Biomedical Materials and Engineering

This course introduces the student to the progress of biomaterials used in biomedical engineering. Starting from early civilization biomaterials, this course discusses modern advanced level biomaterials and their engineering principles associated with their biomedical use. Hip, knee prostheses, implants, grafts, sutures, stents, catheter materials, and their application in Biomedical Engineering are covered. Designed biomaterials such as silicones, polyurethane, Teflon, hydrogels, bionanocomposites are detailed. Modern biology and biomedical engineering such as protein absorption, biospecific medical materials, nonfouling materials, healing and foreign body reaction, controlled release, etc., are discussed. Surface-immobilized biomolecules in patterned surfaces are explained with specific examples for the use of immobilized biomolecules, immobilized cell ligands, and immobilization methods. Recent advances in biomedical engineering from the perspectives of inkjet printing of cells and tissues for 3Dmedical textiles, nanofibers and films in biomedical engineering by electrostatic spinning, bio-inspired materials through layer by layer (LBL) assembly and biogels and advanced instrumentations in biomedical engineering are updated. Artificial red blood and skin substitutes, orthopedic biomaterials applications adhesives and sealants, diagnostics, biomedical sensors, extracorporeal artificial organs and ethical issues of biomedical engineering are discussed.

3 semester hours

BIOMEDICAL ENGINEERING 567 (BMEG/MEEG 567X)

Physiological Fluid Dynamics

There is a great and vital difference between the transport processes in the human body from other engineering systems. A thorough understanding of physiological fluid mechanics is essential for innovation in medical assist and monitoring devices. Emphasis in this course is placed on assist devices, flow and thermal measurements, modeling for engineering application, and understanding appli-

cation to biomedical problems.

3 semester hours

BIOMEDICAL ENGINEERING 580 (BMEG 580)

Tissue Engineering

The objective of this course is to provide students a foundation for the understanding of cell based systems needed for tissue engineering. The structure-property-function relationships in normal and pathological mammalian tissues will be covered. A review of the current development of biological substitutes to restore, maintain, or improve functions that includes strategies to regenerate metabolic organs and repair structural tissues, as well as cell-based therapies to deliver proteins and other therapeutic drugs will be discussed. There are a variety of very important materials issues in tissue engineering, which will be discussed in detail. Cells adherence to the extracellular matrix materials in the body and their enormous effect on cell behavior will be detailed. The physical and chemical properties of these materials will be examined and important materials used in tissue engineering will be discussed

3 semester hours

COMPUTER SCIENCE 551 (CPSC 551)

Advanced Database Design

This course introduces database design with an emphasis on systems (as opposed to applications). Topics include relational model, SQL, database normalization techniques, data storage and indexing, query evaluation and optimization, physical database design, and transaction management.

3 semester hours

Information Analytics, Technology and Decision Support Systems

It is assumed that individuals taking this focus area will have the appropriate academic and business/industrial/STEM background. Those people not having the needed background will be responsible for taking necessary prerequisite courses, which will not count toward the minimum classroom hours required for the Ph.D. degree. Students are expected to have a working knowledge of statistics and a combination of information technology and computer science courses.

COMPUTER SCIENCE 546 (CPSC 546)

Services Oriented Architecture

This course covers Service-Oriented Architectures as well as associated technologies such as XML processing, Web Services and Ajax. SOA is an approach to building a set of web

services such that larger applications are exposed as smaller service modules (web services) that also allow integration via service composition mechanisms to build newer, useful larger applications. SOA is an evolution of distributed object computing and utilizes the messaging design pattern between web services. An application's business logic (middle-tier), or data related functions are modularized and presented as services for consumer/client applications. These services in a proper SOA design are loosely coupled in nature; i.e., the service interface is independent of the implementation. Application developers can build newer applications by composing one or more services without knowing the services' underlying implementations. This course not only presents the concepts behind proper SOAs, but also covers the technologies such as WCF (based on latest WS-* specifications) needed to practically build such architectures.

3 semester hours

COMPUTER SCIENCE 551 (CPSC 551)

Advanced Database Design

This course introduces database design with an emphasis on systems (as opposed to applications). Topics include relational model, SQL, database normalization techniques, data storage and indexing, query evaluation and optimization, physical database design, and transaction management.

3 semester hours

COMPUTER SCIENCE 555 (CPSC 555)

Web-based Application Development

This course provides an introduction to fundamental issues in designing a web-based application. Review of the web technologies such as HTML, VBScript, DHTML, Java, XML and server-side technologies using Active Server Pages (ASP), CGI and Java Server Pages (JSP). Design issues include the creation of tiered and scalable applications by the use of COM+ components involving Microsoft Transaction Server and the Java Beans. Different projects are assigned to create dynamic, database-driven E-Commerce solutions involving, order tracking systems, inventory systems, inventory management, advertising management, creating score reports, personalizing the shopping experience and secure credit card transactions. Wireless E-Commerce applications and developing business-to-business applications using XML, SOAP and Biztalk Servers.

3 semester hours

COMPUTER SCIENCE 556(CPSC 556)

Data Mining

This course is dealing with basic concepts,

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tasks, methods, and techniques in data mining. The focus is on various data mining problems and their solutions, such as association rule, classification, and clustering analysis. Students will learn various techniques for data mining, and apply the techniques to solve data mining problems. The following topics will be discussed in this course Introduction of Data Mining, Mining Frequent Patterns, Associations, and Correlations, Classification and Prediction, Cluster Analysis, Mining Stream, Time-Series, and Sequence Data, Graph Mining, Mining Spatial, Multimedia, Text and Web Data and Applications and Trends in Data Mining.

3 semester hours

COMPUTER SCIENCE 562 (CPSC / CPEG 562)

Information Assurance

This course covers both the principles and practice of information assurance. The topics include law and ethics of information security, intrusion detection, firewall & trusted computing, trust management, authentication & biometrics, authorization and access control, web security, web service security, privacy issues, principles & practices of IT auditing, information systems security professional certification (CISSP). The basic issues to be addressed by information assurance are explored through a tutorial and survey of law and ethics at the very beginning of the course. Then, the detailed practice of information assurance is explored via practical aspects as well as applications that have been used and implemented nowadays.

3 semester hours

COMPUTER SCIENCE 571 (CPSC / CPEG 571)

Internet Computing

This course discusses the principles and practices of computing problems over the Internet. This course focuses on the Internet as a domain for sharing information and resources with cloud systems. The topics include distributed systems, World Wide Web, the browser-cloud computing model, cloud systems, information retrieval and search technologies, multi-agent systems, web usage mining and personalization, social networks, peer-to-peer technologies, and semantic webs. Foundations of Internet computing and how to use modern technological frameworks to develop various Internet-based applications are covered by this course. Application areas include finance and e-business, government services, scientific computing, bioinformatics, collaborative computing, multimedia applications, and file-sharing systems. This course is not intended to be a course on web site development.

3 semester hours

TECHNOLOGY MANAGEMENT 520 (TCMG 520)

Information Systems Development and Design.

This course focuses on the analysis, design, and development of business systems. Students will learn a variety of development models and tools available for systems development, deployment and management. The role of all systems constituents is addressed through discussion of the specification, decision-making, and review of designs, documentation, program specifications, and system improvement. Course level and content is suitable for managerial as well as the more technically oriented.

3 semester hours

TECHNOLOGY MANAGEMENT 521(TCMG 521/ ITKM 505)

Information Systems and Knowledge Management

The purpose of this course is to acquaint the students with some of the organizational and management issues surrounding the emergence of information and knowledge as key factors in developing and maintaining a competitive advantage for firms. The course is organized around two ideas, 1) knowledge as a manageable asset, and 2) why people in organizations sometimes don't use what they know. A basic assumption of the class is that organizations are complex adaptive systems operating in highly competitive, information and knowledge rich environments.

3 semester credits

TECHNOLOGY MANAGEMENT 533 (TCMG 533)

Information Technology Strategy and Governance

This course covers information technology plans, strategy, business/IT alignment, governance, environmental, ethical, economic, regulatory, compliance and technical issues and trends with a focus on planning, organizing, justifying, controlling, implementing and integrating concepts and real world experiences. It discusses business and IT balanced scorecards, metrics and key performance indicators. Current and emerging best business and technology strategy and governance best practice frameworks such as COBIT, CMMI, PMBOK, Kano, ITIM, Prince2, ITIL, select ISO standards and others will be covered with emphasis on lessons learned, critical success factors and pragmatic solutions. Individual and team projects and case studies are integrated into the course.

3 semester hours

TECHNOLOGY MANAGEMENT 540 (TCMG / MEEG 540)

Simulation and Modeling

The purpose of this course is to provide an in depth coverage of the use of simulation and modeling as an analysis tool for the study of

production and distribution processes. The course aims to develop a sense of critical thinking, learning and problem solving. Topics include: problem formulation, data collection and analysis, random variable generation, and statistical analysis of output. Utilizes a major simulation language, SIMAN.

3 semester hours

TECHNOLOGY MANAGEMENT 549 (TCMG 549/ MGMT 548)

Business Intelligence and Decision Support Systems

Decision Support Systems (DSS) are interactive computer based systems that help decision makers understand and use data, models, and other analytical tools to evaluate their options. The course will focus on several aspects of DSS. Topics covered include Data-Driven systems, Model-Driven systems and Communications-Driven systems that help groups solve problems and Knowledge-Driven systems, and Document-Driven systems (expert systems). This course will enhance the student's ability to understand the design and development of DSS with Web technology. Prerequisites: Completion of all required Information Technology and Knowledge Management required concentration courses or concurrent registration in final required concentration courses.

3 semester credits

TECHNOLOGY MANAGEMENT 568 (TCMG 568/ CPSC 568)

Foundation of Information Analytics

This course will introduce the foundation of Informatics. It will review how information sciences and computer technology can be applied to enhance research and practice in management and technology. The basic principles of informatics that govern communication systems, information retrieval, data mining, data warehousing support and evidence based business and technology decision support will be explored. Various Informatics tools will be covered.

3 semester hours

TECHNOLOGY MANAGEMENT 571 (TCMG 571/MGMT 571)

Foundations of Service Management and Engineering

This course integrates topics from economics, engineering, law, technology and organizational theory to deal with how firms change over time to become more service oriented or become service business and the mechanisms and tools by which they seek innovation and competitive advantage in the service sector. The services life cycle is reviewed. In addition, enabling technologies and how different disciplines help to answer questions about how business services combine, evolve, standardize and mature are covered.

3 semester hours

Technology Management

Manufacturing, Supply Chain and Logistics, Technology, Systems and Processes (Electives)

It is assumed that individuals taking this focus area will have the appropriate academic and business/industrial/application background. Those people not having the needed background will be responsible for taking necessary prerequisite courses, which will not count toward the minimum classroom hours required for the Ph.D. degree. Math skills that include calculus are required, and students are expected to have a working knowledge of statistics.

MECHANICAL ENGINEERING 512X (MEEG 512X)

Computational Fluid Dynamics

This course is intended as an introduction to the field of Computational Fluid Dynamics (CFD). Finite difference/finite volume methods will be introduced for solving Navier-Stokes and energy equations in heat transfer and fluid dynamics processes. This course will help students develop practical skills in Computational Fluid Dynamics and the use of commercial CFD packages, such as STAR-CCM+. Students will apply these skills to relevant engineering applications and gain an appreciation of the limitations and advantages of CFD modeling.

3 semester hours

TECHNOLOGY MANAGEMENT 524 (TCMG 524)

Statistical Quality Control Techniques

This course presents a comprehensive summary of methods for managing quality and continuous process improvements. The course objective is to develop an operational familiarity with contemporary methods found to be effective. Topics covered include statistical process control, quality function deployment, concurrent design, the house of quality, the Taguchi method, Six Sigma, lean and others. It also covers continuous process improvement methodologies and techniques. This course is intended for those students who do not plan to specialize in quality management.

3 semester hours

TECHNOLOGY MANAGEMENT 530 (TCMG/ MEEG 530)

Foundations of Manufacturing Management

The objectives of the course are to understand and apply concepts and techniques in manufacturing management. The course includes the management of people (both traditional and high performance systems), lean manufacturing techniques as used on the factory floor, and recent concepts such as Factory

Physics. The course focuses on those issues that are important in supervising and managing a modern manufacturing operation.

3 semester hours

TECHNOLOGY MANAGEMENT 534 (TCMG 534/ MGMT 535)

Strategic Sourcing and Vendor Management

This course covers the rewards and risks of outsourcing and vendor management and identifies where outsourcing should be used and not used. The objectives of the course are to help students understand how to plan, direct, manage and more effectively participate in outsourcing initiatives in terms of the feasibility of outsourcing (off-shore, near-shore, rural-shore, best shore), vendor selection, contract negotiation, vendor management and evaluation, risk assessment and terminating outsourcing deals.

3 semester hours

TECHNOLOGY MANAGEMENT 559 (TCMG 559/ MGMT 560)

Foundation of Business Process and Operations Management

Students in this course apply the methods to projects of their own design and choosing, employing systems designed for application to process management issues. Emphasis is put on quantitative and data-based problem-solving and decision-making processes applied by the professional manager for the improvement of product or service development quality and customer satisfaction. Business process improvement techniques such as lean, Six Sigma and others will be covered.

3 semester hours

TEVHNOLOGY MANAGEMENT 572 /MECHANICAL EMGINEERING 572 (TCMG/MEEG 572)

Production Technology and Techniques

This course will introduce up-to-date technology, techniques and systems of the global manufacturing industry. American manufacturing situation would be analyzed and Japanese manufacturing success is also explored. Comprehensive and readable description of manufacturing practice is researched.

3 semester hours

TECHNOLOGY MANAGEMENT/MECHANICAL EMGINEERING 573 (MEEG/ TCMG 573/MKTG 565)

Supply Chain Management

This course aims at not only covering high-level supply chain strategy and concepts, but also to providing students with a solid understanding of the analytical tools, to understand supply chain design, planning, and operation driven the performance of a firm. It also conveys how supply chain drivers used on a conceptual level during supply chain design and operation leading to performance improvement.

3 semester hours

TECHNOLOGY MANAGEMENT / MECHANICAL EMGINEERING 574 (MEEG/ TCMG 574)

Principles of Logistics

This course presents materials management, logistics theory and concepts in today's manufacturing and commercial environments. It integrates all of the functional areas of the business as well as incorporating logistics into corporate operation. They are examined in light of how they interrelate with other functions for the firms.

3 semester hours

MECHANICAL EMGINEERING 575 (MEEG 575)

Manufacturing Strategy

This course provides the necessary strategic perspective for manufacturing managers' sights and sustaining manufacturing excellence in the competitive manufacturing environment. The strategic perspective of manufacturing forms the approach that places these issues within the rightful context. It emphasizes the essential requirement to link with other functions in order to determine the best strategies for the business as a whole.

3 semester hours

TECHNOLOGY MANAGEMENT 577X (TCMG/MEEG 577X)

Lean Manufacturing

Lean manufacturing is a philosophy based on the elimination of waste in the production system. Use of various concepts such as flow, just-in-time, lead times, inventory turns, standardized work, pull systems, value streams, quick changeover, workplace organization, and visual controls are covered with the focus on improving manufacturing system performance.

3 semester hours

TECHNOLOGY MANAGEMENT 578X (TCMG 578X)

Six Sigma

Six Sigma is a methodology and set of quality management tools (especially statistical methods) used to improve the quality of process outputs, identifying and removing the causes of defects or errors and minimizing variability in manufacturing and business processes. This course teaches the core methods and philosophy of Six Sigma. Develop the leadership skills needed to drive Six Sigma and change effectively.

3 semester hours















