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# **Graduate Degree Programs**

# Analytics and Systems *Master of Science*

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## **The UB MS in Analytics & Systems Value Proposition**

The MS in Analytics & Systems (MS A&S) is a 30-credit graduate program designed to meet the needs of students whose career goals include integrating data, technology, and methods to provide insights for constructive decision-making. The program accomplishes its mission by developing student expertise in technical skill, solution architecture and delivery, analysis and management. Graduates of the MS A&S will be well-positioned to enter contemporary data-driven organizations.

Students will learn both a breadth of knowledge of information systems and a depth of skills in modern analytical methods. Classwork involves both rigorous instruction and required projects to prepare graduates for the unique stresses of this fast-paced industry. A similar MBA program with a concentration in Analytics Intelligence is offered by our Ernest C. Trefz School of Business; this MS A&S is for students looking to focus more on analytics and systems specifically, rather than business management generally.

Positive program outcomes will be achieved through the knowledge and skills the students will acquire from a comprehensive curriculum design, instruction in an effective learning environment, opportunities for inquiry, and professional development. This program largely leverages our existing offerings. While more specific and analytical in nature, these learning outcomes are in line with our institutional mission, and our MBA program.

## **Program Characteristics**

Although students with work experience will find maximum benefit from the MS A&S; no previous work experience is required. The curriculum is designed to recognize and accommodate substantial diversity in preparation and experience as well as the different goals and career expectations of students. For this reason, some students may be required to complete preparatory coursework to successfully graduate from the 30-credit

MS A&S program. Flexible course delivery enables students to proceed at their desired pace. Most students complete the MS A&S program in 18 to 24 months.

## **Learning Outcomes**

Students will integrate the knowledge and skills they have gained throughout their graduate program to develop and evaluate information systems and analytics by:

### **Technical**

- Demonstrating an understanding of concepts learned throughout this graduate program
- Describing the business drivers and critical success factors for effective analytics and systems project and program delivery
- Using research, tools and techniques for complex analytical solutions that capture, consolidate and present information for meaningful insights

### **Human**

- Communicating complicated information at a professional level clearly and concisely
- Understanding how to manage all aspects of the data capture, delivery and analysis process
- Demonstrating initiative, discipline, and follow-through on assignments and projects
- Facilitating meaningful dialogue related to class topics

### **Conceptual**

- Evaluating the advantages and disadvantages of analytics and systems solution designs, tools and visualization options
- Analyzing trends within data, facilitating their application, and sharing throughout the organization
- Applying the theories and techniques learned throughout this program with focus on analytics, information systems, sourcing, and vendor management.

### **Learning Outcomes will be assessed using the following measures:**

- Research papers integrating market trends with class topics

- Exams measuring the effective acquisition of technical, systems design and delivery acumen
- “Hands on” tools and calculation assignments and projects covering key managerial aspects of analytics and systems design and delivery
- Student attendance and class participation
- A thesis or internship that demonstrates the ability to conduct investigations in the analytics and systems discipline.

## **Language Requirement**

Conditionally accepted international students with an undergraduate degree that was taught in a language other than English are required to successfully complete additional language-related coursework and third-party assessment testing before joining the program.

## **Academic Preparation**

Students with undergraduate preparation in a non-business field may be required to complete up to 12 credits of preparatory coursework. Students with a strong academic record (B or better in each case) from an accredited university may be able to waive preparatory foundation courses. Accounting & Business Law (ACCT500) requires both managerial and financial accounting, as well as any course labelled business law that included contracts and tort law. Economics & Finance (ECON500) requires both micro- and macro-economics, as well as finance that included time value of money. Information Systems & Quantitative Methods (ITKM500) requires information systems, intermediate Excel, and either MS Excel- or SAS-based statistics or research methods. Management & Marketing (MGMT500) requires organizational behavior, operations management, and marketing or any similarly named course that includes consumer behavior.

## **Preparatory Courses: Acquiring the Foundation for Success (up to 12 Credits)**

This course provides the basic fundamentals that serve as a necessary foundation for the MS A&S program.

- ACCT500 Accounting & Business Law

# Analytics & Systems *Master of Science*

- ECON500 Economics & Finance
- ITKM500 Information Technology & Quantitative Methods
- MGMT500 Management & Marketing

## **MS A&S Program Curriculum (30 credits)**

### **Core Courses (6 credits):**

ITKM505: Information Systems & Knowledge Management

MGMT555: Global Project Management

### **Analytics Intelligences Courses (9 credits)**

ITKM548 Enterprise Intelligence and Decision Support Systems

ITKM549 Technical Concepts for Analytics Professionals

ITKM560 Foundations in Advanced Analytics

### **Analytics Applications Courses (9 credits)**

MKTG525 Data-Driven Marketing

FIN534 Behavioral Economics and Finance

MGMT534 Strategic Sourcing & Vendor Management

### **Capstone Courses (6 credits)**

GLDP501 Research Methods

BUCP598 Thesis or BUCP599 Internship

## **Eligibility for Transfer Credits in the 30-credit upper-level Program Courses**

For students with graduate coursework from a regionally accredited university: No more than two (graduate) courses may be transferred into the MS A&S program. For students who have earned graduate credit from the Trefz School that is not included in a conferred degree: all applicable (graduate) three-credit courses may be transferred into the MS A&S program.

## **MS/MBA Dual-Degree Program**

The Trefz School offers students the opportunity to acquire concurrent (students must not be eligible to graduate from either program until the final semester) graduate degrees within the Trefz School in which students may apply up to 15 credit hours to both programs. A minimum of 51 credit hours must be completed to satisfy the requirements of this dual-degree program.

The BUCP599 Capstone course is available for dual-degree students with the following modification; students may complete a three-credit internship and one one-credit in each program.”

## **STEM Designation**

The MS A&S is classified by ICE (U.S. Immigration and Customs Enforcement) as a STEM (Science, Technology, Engineering and Math) degree.

## **Progression/Sequence of Coursework**

Preparatory coursework must be taken in the first semester. Students begin the formal MS A&S program by completing the eight Core courses (in any order). The Capstone courses should be taken in the final semester, or final two semesters.

## **Fulltime Status**

Fulltime status requires at least three classes per semester (spring and fall) for international students and at least two classes per semester for domestic students. International students on an F1 or J1 visa may take fewer than 9 credits only once during their graduate tenure (spring and fall semesters), which is only permitted in their final semester.

## **Grading Policy**

A grade of C or better is required for credit toward graduation in all preparatory and program coursework. Students are expected to maintain a semester GPA of 3.0 or better throughout their studies. Those students who earn a semester GPA below 3.0 will be placed on probation and must comply with the associated formal process to successfully maintain proper status.

## **Requirements for Graduation**

To qualify for the award of the degree of Master of Science in Analytics and Systems, a student must fulfill the following minimum requirements:

1. Admitted to candidacy for the degree in the School of Business.
2. Satisfactorily complete all academic requirements with a cumulative grade point average grade of “B” (CGPA = 3.0) or better.
3. File an application for the award of the degree at the Registrar’s Office on or before the date published in the University Calendar.
4. Complete all academic requirements within five (5) years from the date of first registration, unless a petition for extension is granted. Extensions are granted only for compelling reasons.

# Biology *Master of Arts/Science*

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The Biology Master's degree programs offer a contemporary biology curriculum that emphasizes the principles and experimental approaches of modern biology. The M.S. program emphasizes design and execution of experimental research, while the M.A. program emphasizes career building.

The program offers a variety of customized options so students may select an academic plan that best suits their goals. We offer degree course paths in Molecular Biology, Biomedical Science, or Ecology and Evolution. We also offer two degree options, the Master of Science (MS) or Master of Arts (MA) in Biology.

## ***Degree Options***

### **MASTER OF SCIENCE (M.S.) IN BIOLOGY**

This option emphasizes design and execution of experimental work. In this program, the student will be required to complete a thesis featuring an original research. Students in this program will most likely be pursuing terminal degrees following the completion of their degree.

### **MASTER OF ARTS (M.A.) IN BIOLOGY**

This option emphasizes career building. As a student in the M.A. degree program, students will have the option of pursuing an internship or completing their degree with coursework only. Students in the M.A. degree program will most likely be working professionals interested in advancing their careers by gaining expertise in the field of biology.

### **CAREERS AND PROFESSIONS AVAILABLE TO GRADUATES OF THE PROGRAM.**

The program advances the skills and training of students with degrees in Biology or related fields, making them competitive for jobs in private, academic, and government research institutions, clinical laboratories, government agencies, teaching opportunities and those seeking to strengthen their applications to doctoral programs and other professional programs. Graduates with master's degrees

in biology are expected to have additional opportunities in nonscientist positions related to biology, in fields like sales, marketing, publishing, and research management. Some examples of nonscientist job titles that require or prefer a Master's degree include Proposal Development Specialist, Global Product Manager, Technical Sales Representative, and Land Management Specialist.

### **OBJECTIVES OF THE PROGRAM**

The M.S. program requires a minimum of 33 credit hours of coursework designed to meet stated objectives of student learning for the program. All credit hours must therefore be graduate level (400-level or higher) courses in Biology, or cognate courses tailored to individual student interests, in Chemistry, Mathematics, Computer Science, Engineering, Health Science, or Medical Technology. All cognate courses are subject to departmental approval of their contributions to either the research or career skill acquisitions listed in the programs objectives (see item III.1 below). Every student in the program must take the core courses Biology 445, 470, 490, 498 or 499 and Math 423B. Those electing the thesis option (M.S.) must complete twenty four credits of course work and six credits of Master's Research, culminating in a written thesis and oral defense, demonstrating the program's objective of successful acquisition by the student of independent research skills. Students choosing the non-thesis option (M.A.) must either complete thirty three credits of course work in Biology or cognate courses aimed at further acquisition and refinement of program student learning objectives or thirty credits of course work and, with the approval of the graduate Chair of biology, three credits of intern experience in a professional setting aimed at student acquisition of career skills targeted by the program. Both MS and MA students should take examinations, oral or written as appropriate. Upon completion of the internship, the student should have a written report by the intern advisor and should present a seminar at UB, demonstrating successful completion of the area of her/his internship.

### ***Program Admissions and Special Requirements***

Applicants to the M.S. and M.A. programs must submit the following documents:

- Official transcripts of all undergraduate (and any graduate) work

- Evidence of successful completion of the baccalaureate degree, with an overall cumulative index of B as well as a B or better average in program prerequisites: Biology and cognate science courses, such as Biochemistry, Chemistry, or applied clinical lab-based science courses.
- Two letters of recommendation
- For M.A. students: If students decide to complete the internship, they will be required to submit a letter of sponsorship from a suitable internship site after enrolling in the graduate Biology program.

In addition, the candidate must have the following pre-requisites.

At least one course (minimum of 3 credits) with a grade of C or better in each of the following areas: math, organic chemistry, physics, genetics, and cell & molecular biology. All prerequisites with the exception of genetics must include a lab. The courses must be designated as appropriate for biology majors. Students will not be admitted to the program with more than 9 credits of deficiency. Credits from courses addressing deficiency do not count toward the M.S./M.A degree. Deficiencies must be remediated in the first 12 credits of the program either at UB or, with prior permission from the program chair, from elsewhere.

### ***Learning Outcomes***

The program will prepare graduates to:

- Search, read and interpret current biological literature
- Develop an in-depth understanding of the scientific issues of a particular area of biology
- Develop expertise in research methods associated with an area of biology
- Develop professional skills related to work in a specific area of biology or biomedical science
- Integrate techniques, skills, and understanding of scientific principles across various area sub-disciplines of biology.

The M.S. program will also develop independent scientific research skills, including the ability to:

- Formulate scientific hypotheses, design and execute experiments
- Collect, analyze and interpret experimental data

# Biology *Master of Arts/Science*

- Deliver scientific ideas and experimental results both at scientific meetings and through preparation and publication of manuscripts

The M.A. program will also develop professional work skills, including the ability to:

- Integrate knowledge of biology and biological research to occupations in clinical settings
- Apply knowledge of biology and biological research to occupations in commercial or policy settings

These objectives serve the university's mission to offer "career-oriented undergraduate, graduate and professional degrees and programs for people seeking personal and professional growth."

## **Graduation requirements**

Comprehensive Examination: All students must pass an oral or written comprehensive examination as determined by their advisors, covering current theory, application and research in areas appropriate to their training and interests. In addition

- M.S. candidates must also submit and defend a research thesis, which demonstrates the student's ability to conduct independent research.
- M.A. candidates who choose the internship option must also submit a recommendation letter from their internship mentor and an internship report describing the work done in their internship and the professional advancement outcomes achieved. Furthermore the student should present her/his work in a seminar at UB.

## **Curriculum**

### **Program Common Core Courses** \_\_\_\_\_ Cred hrs

Bio 445	Advanced Methods in Molec Biology	3
Bio 470	Research Rotation	1
Bio 490	Departmental Seminar	1
Bio 498	Internship	3
Bio 499	Master's Research <sup>b</sup>	6
Math 423B	Biostatistical Analysis	4

### **Molecular Biology** \_\_\_\_\_ Cred hrs

Bio 404	Tissue Culture	3
Bio 407	Microbial Genetics	3
Bio 421	Advanced Cell Biology	3
Bio 479	Bioinformatics	3

### **Biomedical Science** \_\_\_\_\_ Cred hrs

Bio 418	Environmental Health	3
Bio 441	Immunology	3
Bio 446	Environmental Toxicology	3
Bio 491	Gut Microbiota in Health and Disease	3

### **Ecology and Evolution** \_\_\_\_\_ Cred hrs

Bio 402	Evolution	3
Bio 423	Advanced Ecology	3
Bio 424	Physiological Ecology	3
Bio 479	Bioinformatics	3

### **Elective Courses** \_\_\_\_\_ Cred hrs

Bio 401	Histology	4
Bio 441	Immunology	4
Bio 444	General Toxicology	4
Bio 480	Special Topics	3
Bio 493	Bioelectric Phenomena	1
Bio 497	Selected Topics in Integrated Health and Healing	1
Bio 500	Maintaining Matriculation	0

<sup>a</sup> for M.A., <sup>b</sup> for M.S.

# Biomedical Engineering *Master of Science*

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Master of Science degree in Biomedical Engineering (BME) is intended to prepare individuals with a strong scientific and technical background for entry into Biomedical Engineering field at an advanced level and for further study leading to doctorate. Admission to the interdisciplinary BME program requires an undergraduate background that includes elementary coursework in biomedical engineering, biotechnology, biology, clinical science, pharmaceutical science and also includes any branch of science and engineering that permeates through the Fundamentals and advanced courses in engineering and the life sciences. The program offers innovative educational strategy that integrates biological sciences and engineering, and applies engineering tools, methods and practices to solve problems in biology and medicine. Graduates of our programs are expected to be highly-skilled biomedical engineers, and scientists who understand the ethical, social and economic implications of their work. The following fundamental course work has been identified to benefit the students most if they have them in their undergraduate degrees.

- Biomedical Engineering and Engineering
- Tissue Engineering
- Bioelectronics
- Tissue Culture
- Physiology

Applicants with superior academic credentials but lacking the required background can be admitted subject to their taking the necessary preparatory courses. Applicants are expected to have an average B or better in their undergraduate course work. Department offers the unique opportunity to its graduate students the education and research on how to integrate several engineering discipline principles in biomedical engineering.

The Department also offers, as an integral part of the Biomedical Engineering Masters Degree, the opportunity to specialize in several concentration areas.

1. Computer communication and networking in biomedical engineering
2. Biorobotics and automation
3. Biomedical Materials and Engineering

4. Bioelectronics
5. Biotechnology
6. Biomedical signal and Image Processing
7. Wireless and mobile communication pertaining to Biomedical Engineering
8. Bioinformatics
9. Tissue Engineering

In addition the department also offers the opportunity to acquire dual graduate degree with electrical engineering (dual MS degree in BME/ELEG). Candidates for the dual Masters Degree programs are typically required to complete a total of 49 credit hours to satisfy the requirement of two Masters Degrees. This implies 15 credit hours in addition to the 34 credits required for the MS degree in Biomedical Engineering.

## Learning Outcomes

Consistent with the university's vision, and with the missions of the School of Engineering and the Biomedical Engineering Program, the educational objectives for the Master of Science in Biomedical Engineering program were established as follows:

- Graduates of the BME program will have a sound integrated knowledge of science and engineering fundamentals with respect to the biomedical issues.
- Graduates will be proficient in the use of modern techniques, tools, procedures, and information sources which are useful in the definition and solution of problems in biomedical engineering.
- Graduates will have the ability to apply their scientific knowledge and engineering tools and techniques to design useful and economically feasible novel materials, devices, systems and processes which address problems relevant to the fields of biomedical engineering.
- Graduates will have the breadth and depth of knowledge, and a commitment to continued learning, necessary to understand the economic, social, ethical, and aesthetic aspects of their profession and their work, and to effectively communicate the results of their work.

## Course Requirements

### REQUIRED COURSES

**A. A total of 34 semester hours is required. The core curriculum consists of 16 credits and includes:**

BMEG 565	Biomedical Materials and Engineering (3 credits)
BMEG 412	Bioelectronics (3 credits)
BMEG 580	Tissue Engineering (3 credits)
BMEG 620	Team based research (6 credits)
ENGR 400	Seminar (1 credit)

**B. The remaining 18 credits are elective courses.**

The elective courses may be chosen from the list of BME concentration areas or chosen in consultation with the graduate advisor. The course descriptions are in the Graduate Studies Division section of the Catalog.

**C. A team based research project of 6 credits is compulsory and the course number for that is BMEG 620 as mentioned under core courses**

### CORE COURSES

BMEG 410	Biosensors
BMEG 412	Introduction to Bioelectronics
BMEG 440	Ergonomic Factors in Design
BMEG 451	Introduction to BioMEMS
BMEG 452	Biomedical Imaging
BMEG 503	Biometrics
BMEG 506	Transport Phenomena in Biological Systems
BMEG 507	Algorithm in Bioinformatics
BMEG 508	Biomechanics
BMEG 511	Design and development of Biomedical Instrument
BMEG 520	Physiology
BMEG 530	Instrumentation and Laboratory Experience
BMEG 531	Robotics in Bioengineering
BMEG 533	Communication Engineering in Biomedical Systems
BMEG 534	Electrochemistry in Biological Systems
BMEG 540	Advanced Cellular and Molecular Biology
BMEG 541	Foundations of Biotechnology and Bio-entrepreneurship
BMEG 546	Biosignal Processing
BMEG 560	Advanced Tissue Engineering
BMEG 569	Advanced Biomedical Materials and Engineering
BMEG 571	Ethical Issues in Biomedical Research

# Business Administration *Master of Business Administration Degree*

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## **The UB MBA Value Proposition**

The Master of Business Administration (MBA) is a valuable education for aspiring and practicing managers in any industry or field of endeavor. The graduate program provides early to mid-career professionals with the breadth and depth of theoretical and practical knowledge and skills that are necessary for effective leadership in an increasingly international and dynamic environment. Our innovative, interdisciplinary, and interactive MBA experience emphasizes leadership, teamwork, analytical thinking, business and management competencies, and communication to give you a competitive edge for success.

## **Program Characteristics**

Although students with work experience will find maximum benefit from the MBA; no previous work experience is required. The curriculum is designed to recognize and accommodate substantial diversity in preparation and experience as well as the different goals and career expectations of students. For this reason, some students may be required to complete preparatory coursework to successfully graduate from the 36-credit MBA program. Flexible course delivery enables students to proceed at their desired pace. Most students complete the MBA program in 18 to 24 months.

## **Learning Outcomes:**

Students will demonstrate

- knowledge in all - and proficiency in at least one of - the basic business disciplines (accounting, economics, entrepreneurship, finance, human resources, information systems, leadership, management, and marketing).
- the ability to communicate ideas clearly and concisely in oral and written structures, and in formal and informal settings.
- interpersonal and professional skills that enable them to contribute within diverse sets of teams and build internal and external relationships that facilitate success in contemporary organizations.

- information literacy, proficiency with technology, and analytical techniques for decision-making.
- critical and logical thinking that integrates concepts across disciplines with creativity and integrity enabling them to successfully lead in a dynamic global environment.

## **Assessment**

- Papers, presentations, responses to cases, and projects are evaluated using formal rubrics as measures.
- Students, and the program as a whole, are evaluated and benchmarked across the basic business disciplines (formative - with the use of standardized academic tests) and (summative - with the use of independent third-party tests).
- Students, working in teams, are evaluated based on team performance and individual contribution.

## **Language Requirement**

Conditionally accepted international students with an undergraduate degree that was taught in a language other than English are required to successfully complete additional language-related coursework and third-party assessment testing before joining the program.

## **Academic Preparation**

Students with undergraduate preparation in a non-business field may be required to complete up to 12 credits of preparatory coursework. Students with a strong academic record (B or better in each case) from an accredited university may be able to waive preparatory foundation courses. Accounting & Business Law (ACCT500) requires both managerial and financial accounting, as well as any course labelled business law that included contracts and tort law. Economics & Finance (ECON500) requires both micro- and macro- economics, as well as finance that included time value of money. Information Systems & Quantitative Methods (ITKM500) requires information systems, intermediate Excel, and either MS Excel- or SAS-based statistics or research methods. Management & Marketing (MGMT500) requires organizational behavior, operations management, and marketing or any similarly named course that includes branding and consumer behavior.

## **Preparatory Courses: Acquiring the Foundation for Success (12 Credits)**

This coursework provides the basic fundamentals across the business disciplines that serve as a necessary foundation for the MBA program.

- ACCT500 Accounting & Business Law
- ECON500 Economics & Finance
- ITKM500 Information Technology & Quantitative Methods
- MGMT500 Management & Marketing

## **MBA Program Curriculum: (total of 36 credits)**

- Three Components: Core, Concentration, and Capstone

### **Core Courses (18 credits)**

In the six Core courses you will apply the theory from the Foundation coursework through cases and real-world exercises.

- ACCT505 Managerial & Cost Accounting
- FIN505 Advanced Financial Management
- ITKM505 Information Systems & Knowledge Management
- MGMT505 Organizational Behavior
- MGMT555 Global Project Management
- MKTG505 Marketing & Branding

### **Concentration Courses (9 credits)**

Because many careers require specialized and in-depth knowledge and skills in specific business areas, the program provides students with the opportunity to complete three courses of in-depth study in an area of their choice. Students may choose from eight concentrations.

- Accounting
- Analytics Intelligence
- Entrepreneurship
- Finance
- General
- Human Resources
- International
- Marketing

# Business Administration *Master of Business Administration Degree*

## Capstone Courses (9 credits)

The Capstone experience provides the final integration of student learning across the disciplines and the application of concepts learned to practical and competitive situations.

### Capstone (9 credits)

- Integration (required)
  - BUCP597 Strategy & Policy
- Practicum (select one)
  - MGMT582 Business Planning
  - BUCP589 Cases in Ethics, Innovation, & Leadership
  - BUCP588 Research Methods
- Experiential (select one)
  - MGMT582 Business Planning
  - BUCP589 Cases in Ethics, Innovation, & Leadership
  - BUCP598 Thesis (requires GLDP501: advisor assigned by discipline)
  - BUCP599 Internship

## Eligibility for Transfer Credits in the 36-credit upper-level Program Courses

For students who have earned graduate credit from a regionally accredited university that is not included in a conferred degree: No more than two (graduate) three-credit courses may be transferred into the MBA program. For students who have earned graduate credit from the Trefz School that is not included in a conferred degree: all applicable (graduate) three-credit courses may be transferred into the MBA program.

## MBA/MS Dual-Degree Program

The Trefz School offers students the opportunity to acquire concurrent (students must not be eligible to graduate from either program until the final semester) graduate degrees within the Trefz School in which students may apply up to 15 credit hours to both programs. A minimum of 51 credit hours must be completed to satisfy the requirements of this dual-degree program.

## Multiple MBA Concentrations

Students may gain additional concentrations by successfully completing three courses in any of the eight concentrations (courses may not be counted twice toward concentra-

tions). Students may receive a double concentration in their original concentration by taking three additional advanced courses in the discipline.

## MBA/Engineering Partnership

In an arrangement, with the School of Engineering, approved Engineering courses offered by the College of Engineering are available for students in the MBA degree. Specific courses for this study are selected with - and approved by - the student's advisor.

## Progression/Sequence of Coursework

Preparatory coursework is the first step: Students start their studies by completing all necessary Preparatory courses. Once all the Preparatory courses have been completed, students may enter the formal MBA program. In some cases, students may take a combination of Preparatory and Core courses during their transition into the Program, but students should not take a Preparatory and advanced class in the same discipline at the same time (e.g. ITKM500 and ITKM505).

Students begin the formal MBA program by completing the six Core courses (in any order). The three Capstone courses should be taken in the final semester, or final two semesters, and must only be taken once all Core courses have been successfully completed (not concurrently).

## Fulltime Status

Fulltime status requires at least three classes per semester (spring and fall) for international students and at least two classes per semester for domestic students. International students on an F1 or J1 visa may take fewer than 9 credits only once during their graduate tenure (spring and fall semesters), which is only permitted in their final semester.

## Grading Policy

A grade of C or better is required for credit toward graduation in all preparatory and program coursework. Students are expected to maintain a semester GPA of 3.0 or better throughout their studies. Those students who earn a semester GPA below 3.0 will be placed on probation and must comply with the associated formal process to successfully maintain proper status.

## Requirements for Graduation

To qualify for the award of the degree of Master of Business Administration, a student must fulfill the following minimum requirements:

1. Admitted to candidacy for the degree in the School of Business.
2. Satisfactorily complete all academic requirements with a cumulative grade point average grade of "B" (CGPA = 3.0) or better.
3. File an application for the award of the degree at the Registrar's Office on or before the date published in the University Calendar.
4. Complete all academic requirements within five (5) years from the date of first registration, unless a petition for extension is granted. Extensions are granted only for compelling reasons.

# Computer Engineering *Master of Science Degree*

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The Master's Degree in Computer Engineering is a course of study intended to prepare individuals whose undergraduate background is in computer or electrical engineering for advanced professional work in the field and for further study leading to the doctorate. Emphasis is placed on current state-of-the-art applications including parallel computing, image processing, VLSI design, sensing, robotics, mobile computing, automation and the like. Admission to the program requires an undergraduate degree in engineering, and includes the following fundamental coursework:

- Programming Languages and Techniques
- Data Structures
- Digital Design
- Digital Design Lab
- Computer Organization
- Microprocessors
- Probability and Statistics

Applicants with superior academic credentials but lacking the required background can be admitted subject to their taking the necessary preparatory courses. Applicants are expected to have an average of B or better in their undergraduate coursework.

The Department also offers, as an integral part of the Computer Engineering Masters Degree, the opportunity to specialize in several concentration areas.

Computer Engineering Concentration areas:

1. Advanced Applications and Systems Programming
2. Bio-Medical Engineering
3. CAD/CAM
4. Computer and Information Security
5. Computer Communications and Networking
6. E-Commerce
7. Microelectronics and Computer Architecture
8. Modern Data Base Systems
9. Robotics and Automation
10. Signal and Image Processing
11. Software Engineering

12. Very Large Scale Integration (VLSI)

13. Wireless and Mobile Communications

Please refer to the Graduate Studies Division Catalog pages for course details of the concentration areas.

In addition, the department also offers the opportunity to acquire dual graduate degrees along with the M.S. degree in Computer Engineering. Candidates for these dual Masters degree programs are typically required to complete a total of 48 credit hours to satisfy the requirements of two Masters degrees. This implies 15 credit hours in addition to the 33 hours required for the M.S. degree in Computer Engineering.

Please refer to the Graduate Studies Division catalogue pages for detailed information on Dual Graduate Degree programs.

Furthermore, customized study plans to allow receiving the Computer Engineering M.S. degree while pursuing either the Ph.D. degree in Computer Science and Engineering or the Ed.D. degree in Education are available. Doctoral students in these two programs should consult their respective doctoral advisors to work on their individualized plans. Further details on the dual M.S. in Computer Engineering degree programs are available in the catalog section on the Graduate Studies Division.

## Program Objectives

Our Computer Science Students will:

- Apply foundational scientific concepts and sound engineering principles efficiently and effectively.
- Be well-educated, highly valued, and successful engineers and scientists.
- Significantly contribute to technical interdisciplinary team projects.
- Professionally communicate technical solutions and results.
- Continue to pursue lifelong multidisciplinary learning as professional engineers and scientists.

## Learning Outcomes

Our Computer Engineering Students will:

1. Demonstrate an in depth and comprehensive understanding of Computer Engineering.
2. Have an enhanced ability to learn, on their own, technical details for which

they are responsible.

3. Have an enhanced ability to apply the knowledge learned to solve technical problems that arise in research they conduct or supervise.
4. Have an enhanced ability to study an issue, identify and evaluate alternative actions, propose an optimal course of action.
5. Have an enhanced ability to prepare technical point papers, brief their seniors, and defend their conclusions.

## Course Requirements

### REQUIRED COURSES

**A. A total of 34 semester hours is required. The core curriculum consists of 15 credits and includes:**

CPCSC 501	Object Oriented Programming using Software Design Patterns Using C++
CPEG 410	Introduction to Computer Architecture
CPEG 572	Data and Computer Communication
CPEG 448D	Introduction to VLSI Design
or CPEG 447	Logic Synthesis Using FPGAs
ELEG 443	Applied Digital Signal Processing

**B. THE REMAINING 18 CREDITS ARE ELECTIVE COURSES.**

The elective courses may be chosen from the list of Computer Engineering concentration areas or chosen in consultation with the graduate advisor. Also, students are required to take ENGR 400 (Engineering Colloquium).

The course requirements of the concentration areas are described in the Graduate Studies Division section of the catalog.

**C. STUDENTS MUST DO A MASTERS PROJECT (3 CREDIT HOURS) OR THESIS (6 CREDIT HOURS) AS PART OF THE 18 ELECTIVE CREDIT HOURS.**

The concentration areas can be applied to satisfy the requirements of second Masters degree programs of study.

# Computer Science *Master of Science Degree*

*Chair:* Ausif Mahmood  
Engineering Technology Building  
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Email: mahmood@bridgeport.edu

The Master's Degree in Computer Science is intended to prepare individuals with a strong mathematical, scientific, or technical background for entry into the computer science field at an advanced level and for further study leading to the doctorate. Admission to the program requires an undergraduate background that includes elementary physics, calculus sequence, linear algebra, and the following fundamental coursework in computer science:

- Programming Languages and Technique
- Data Structures
- Digital Design
- Discrete Structures
- Computer Organization
- Probability and Statistics

Applicants with superior academic credentials but lacking the required background can be admitted subject to their taking the necessary preparatory courses. Applicants are expected to have an average of B or better in their undergraduate coursework.

The Department also offers, as an integral part of the Computer Science Masters Degree, the opportunity to specialize in several concentration areas.

Computer Science Concentration Areas:

1. Advanced Applications and Systems Programming
2. Bio-Medical Engineering
3. CAD/CAM
4. Computer and Information Security
5. Computer Communications and Networking
6. E-Commerce
7. Microelectronics and Computer Architecture
8. Modern Data Base Systems
9. Robotics and Automation
10. Signal and Image Processing
11. Software Engineering
12. Very Large Scale Integration (VLSI)
13. Wireless and Mobile Communications

Please refer to the Graduate Studies Division Catalog pages for course details of the concentration areas.

In addition, the department also offers the opportunity to acquire dual graduate degrees along with the M.S. degree in Computer Science. Candidates for these dual Masters degree programs are typically required to complete a total of 48 credit hours to satisfy the requirements of two Masters degrees. This implies 15 credit hours in addition to the 33 hours required for the M.S. degree in Computer Science.

Please refer to the Graduate Studies Division catalogue pages for detailed information on Dual Graduate Degree programs.

Furthermore, customized study plans to allow receiving the Computer Science M.S. degree while pursuing either the Ph.D. degree in Computer Science and Engineering or the Ed.D. degree in Education are available. Doctoral students in these two programs should consult their respective doctoral advisors to work on their individualized plans. Further details on the dual M.S. in Computer Science degree programs are available in the catalog section on the Graduate Studies Division.

## Program Objectives

Our Computer Science Students will:

- Apply foundational scientific concepts and sound engineering principles efficiently and effectively.
- Be well-educated, highly valued, and successful engineers and scientists.
- Significantly contribute to technical interdisciplinary team projects.
- Professionally communicate technical solutions and results.
- Continue to pursue lifelong multidisciplinary learning as professional engineers and scientists.

## Learning Outcomes

Our Computer Engineering Students will:

1. Demonstrate an in depth and comprehensive understanding of Computer Science.
2. Have an enhanced ability to learn, on their own, technical details for which they are responsible.

3. Have an enhanced ability to apply the knowledge learned to solve technical problems that arise in research they conduct or supervise.
4. Have an enhanced ability to study an issue, identify and evaluate alternative actions, propose an optimal course of action.
5. Have an enhanced ability to prepare technical point papers, brief their seniors, and defend their conclusions.

## Course Requirements

### REQUIRED COURSES

**A. A TOTAL OF 33 SEMESTER HOURS IS REQUIRED. THE CORE CURRICULUM CONSISTS OF 15 CREDITS AND INCLUDES:**

CPSC 400	Object Oriented Programming Using C++
CPSC 450	Data Base Design
CPSC 502	Analysis of Algorithms
CPSC 503	Operating Systems
CPEG 471	Data and Computer Communication

**B. THE REMAINING 18 CREDITS ARE ELECTIVE COURSES.**

The elective courses may be chosen from the list of Computer Science concentration areas or chosen in consultation with the graduate advisor.

The course requirements of the concentration areas are described in the Graduate Studies Division section of the catalog.

**C. STUDENTS MUST DO A MASTERS PROJECT (3 CREDIT HOURS) OR THESIS (6 CREDIT HOURS) AS PART OF THE 18 ELECTIVE CREDITS HOURS.**

Since July 2004, the Department of Computer Science and Engineering has been offering the full M.S. degree program in Computer Science through distance learning. For more information please contact the department or visit: <http://www.bridgeport.edu/ub/dlearning/>

The concentration areas can be applied to satisfy the requirements of dual Masters degree programs of study.

# Counseling *Master of Science Degree*

*Director:* Director: Sara Connolly  
Charles A. Dana Hall, Room 163  
Telephone: (203) 576- 4183  
Fax: (203) 576-4051  
Email: sconnoll@bridgeport.edu

*Secretary (information and application material):* Angela DiMario  
Charles A. Dana Hall  
Telephone: (203) 576- 4271  
Fax: (203) 576-4051  
Email: adimario@bridgeport.edu

*Faculty:* A. Buller S. Connolly, L. Leedom

## **Admissions Requirements**

The University has a rolling admissions policy. To be fully admitted applicants must have a bachelor's degree from an accredited college or university with a minimum GPA of 2.75. Applicants are expected to have at least 9 credits of psychology coursework (graduate or undergraduate) such as Personality Theories, Abnormal Psychology, or Clinical Psychology. They must also successfully complete the supplemental application portfolio which includes personal references, a writing assignment, and an official transcript.

## **PROGRAM PREREQUISITES**

Bachelors degree, or its equivalent, from an accredited university or recognized international institution

Undergraduate cumulative grade point average of 2.75 or higher

Nine credits in undergraduate psychology coursework with a grade of B or higher; three of the nine credits may be in an area closely related to psychology

- It is recommended that clinical mental health counseling applicants have three undergraduate credits in either abnormal psychology or psychopathology

## **REQUIRED MATERIALS**

University of Bridgeport graduate application

\$50 application fee (non-refundable)

- Checks or money orders should be made payable to the University of Bridgeport
- Official transcripts from every school attended
- International transcripts must include an official course-by-course evaluation of all academic work from an accredited academic evaluating service

Two recommendation letters

- Letters must be signed and come from employers, professors or professional associates
- Clinical mental health counseling applicants must obtain at least one recommendation letter from someone who can attest to field experience

## **PERSONAL STATEMENT**

In 250-500 words, detail your interest in the counseling program, your relevant academic and personal experience, and describe your professional plans

- Resume
- Interview

Once all required materials are received, you will be contacted to meet with the review committee

## **DEADLINES**

Completed application and all supporting documents must be received by:

May 1 for priority consideration, August 1 (final deadline) for the fall semester

October 1 for priority consideration, December 15 (final deadline) for the spring semester

*It is highly recommended that you meet our priority deadline as program space is limited. If admitted, priority candidates receive preferred course registration.*

In addition to the general admissions requirements listed above, admission decisions for the Clinical Mental Health Counseling concentration will give careful consideration to indicators of candidate life experience and maturity (e.g., successful work experience in a human service field). A personal interview is also required.

Applicants who hold a bachelor's degree from an accredited college or university but do not meet one or more of the above criteria may be admitted provisionally. Those without the recommended background in Psychology will be required to take additional psychology-related coursework as part of their degree program. Those admitted on provisional status may be fully admitted once they have completed 12 credits of coursework with a grade point average of 3.0 or higher.

Although students may enter the program in any term, it is advised to begin in the fall. Students who begin in the spring or summer may have limited course options.

## **Programs**

The Division of Counseling offers a Master of Science degree in Counseling with concentrations in Clinical Mental Health Counseling and College Student Personnel. In addition to the master's degree, a Certificate of Advanced Study (CAS) is offered for those who wish to take specialized courses beyond the masters and/or complete licensure requirements. Students who apply to one program and wish to transfer to another must apply to change programs.

Upon entry into a program, students plan an individualized plan of studies with their advisor in which graduate transfer credit of no more than six credits may be included. While students can take courses at their own pace, all of the counseling degree programs require a minimum of two years to complete. There is a set sequence of courses for each concentration and some courses have prerequisites. Courses are offered once a year, typically in the evening or on weekends. In addition, there is a seven year time limit for completion of all degree requirements.

Typically students take two or three courses each term. Many students have full or part-time employment. Although it is possible to take all course work in the late afternoon, evening, or on weekends, some additional time during the day may be required to meet course expectations. This is especially true for internship placement.

## **Professional Licensure**

Students interested in licensure should consult the state in which they wish to practice for specific requirements. The State of Connecticut requires 60 credit masters degree.. Specific areas of coursework are also required. In addition, candidates for licensure must complete supervised clinical experiences and obtain a qualifying score on a standardized examination. Students who wish to pursue licensure should select the Clinical Mental Health Counseling concentration.

## **Certificate of Advanced Study**

For individuals who hold a master's degree in Counseling or a closely related field but lack one or more of the requirements for licensure as a professional counselor, the Division of Counseling and Human Resources offers a specialized program of study leading to a Certificate of Advanced Study (CAS) in Clinical Mental Health Counseling. The require-

# Counseling Master of Science Degree

ments of this program are individualized to the needs and goals of each student and consist of 30 credits.

## Practicum

The practicum is designed to allow students to develop their counseling skills in a closely supervised setting. The course instructor, student's advisor, and site supervisor determine appropriate practicum activities. Activities could include observing/shadowing, attending staff meetings, tutoring, advising, interviewing professional staff members, studying materials and procedure manuals, and other support functions.

## Internship

Following the practicum and pre requisite courses, students will pursue an internship. 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. The internship operationalizes this training and, in the person of the clinical supervisor, personifies the profession with which the intern ideally identifies. Therefore, careful consideration should be given to the type of internship site that you choose and you should discuss this closely with your advisor. Successful internship training can only occur when program faculty and site supervisors form a close collaborative relationship with the mission of providing quality training and the development of the intern as a whole person. Internships are not guaranteed and approval to attend internship is dependent upon students' performance both interpersonally and academically. Internships must be completed over two semesters, typically over the course of a full academic year, starting in the fall and ending in the spring.

## Learning Outcomes

Graduates in Clinical Mental Health Counseling will:

- Evidence understanding of the role of a counselor; including ethical practice, counselor behaviors and professional associations

*As measured by: Internship, Participation in professional associations, C570, C568*

- Demonstrate knowledge, awareness and skills requisite for counseling persons from different cultural contexts and of different levels of ability

*As measured by: C512, C545, Internship, CPCE*

- Apply counseling theories, techniques and intervention to practice; in individual and group settings

*As measured by: C505, C570, Internship, C512, C540*

- Demonstrate knowledge of the ethical use of appraisal instruments

*As measured by: C582, CPCE*

- Demonstrate an ability to diagnose mental health status

*As measured by: C515, Internship*

- Demonstrate an ability to review counseling research and integrate its contribution to specific areas of knowledge

*As measured by: C535, CPCE*

- Demonstrate knowledge of, and skills in Cognitive Behavioral Therapy

*As measured by: C505, C570, Internship*

Graduates in College Student Personnel will:

- Demonstrate knowledge, awareness and skills requisite for working with students from different cultural contexts and of different levels of ability

*As measured by: C545, Internship*

- Demonstrate an ability to review field related research and integrate its contribution to specific areas of knowledge

*As measured by: C536*

- Apply knowledge of counseling theories and developmental theory as well as best practices in Student Affairs and student

*As measured by: Internship, C512, C555, Cumulative Exam*

- Evidence understanding of role of the Student Affairs professional; including ethical behavior and professional affiliation

*As measured by: Internship, Professional Associations*

- Demonstrated an ability to assess needs of different groups within a particular college environment, develop appropriate program, implement and assess program

*As measured by: Internship*

- Demonstrate understanding of the historical influences that have shaped student affairs practice

*As measured by: C527, Cumulative Exam*

- Demonstrate knowledge of current issues in higher education and the purpose and function of student affairs practice in higher education

*As measured by: C503, C520, Cumulative Exam*

- Demonstrate an ability to integrate the knowledge and awareness gained to individual courses

*As measured by: Cumulative Exam*

Graduates in Human Services will:

- Evidence understanding of the role of a counseling professional; including ethical practice, behaviors and professional associations

*As measured by: Internship, C568, professional associations*

- Demonstrate knowledge, awareness and skills requisite for working with persons from different cultural contexts and of different levels of ability in a counseling setting

*As measured by: C510, C545, Internship*

- Apply counseling theories, techniques and intervention to practice; in individual and group settings

*As measured by: C505, C540, Internship*

- Demonstrate knowledge of the historical influences within human services and the management within the human service environment

*As measured by: C532, C625, C620*

- Demonstrate an ability to review counseling research and integrate its contribution to specific areas of knowledge

*As measured by: C535, Masters Project*

- Demonstrate an ability to integrate the knowledge and awareness gained to individual courses

*As measured by: Internship, Masters Project*

## Summary of Requirements

Masters students in the Division of Counseling are required to complete the following courses:

# Counseling *Master of Science Degree*

## CONCENTRATION IN CLINICAL MENTAL HEALTH COUNSELING (CMHC)

The concentration in Clinical Mental Health Counseling is designed to prepare students for work as mental health counselors and requires advanced coursework in clinical skills, psychopathology, appraisal procedures, addiction, and psychotherapeutic techniques.

	Credit Hours
Coun505 Helping Relationships	4
Coun568 Counselor as Professional	3
Coun545 Social & Cultural Foundations	3
Coun540 Group Process Application & Theory	4
Coun610 Career & Lifestyle Development	3
Coun512 Theories of Counseling	3
Coun570 Strategies & Techniques of Counseling	4
Coun582 Appraisal Processes for Counselors	3
Coun595 Addiction & Treatment	3
Coun535 Research Methods	3
Coun552 Human Growth & Development	3
Coun600 Clinical Mental Health Counseling Internship 1	4
Coun605 Clinical Mental Health Counseling Internship 2	4
Coun585 Trauma & Crisis Intervention	3
Coun587 Psychopharmacology	3
Coun502 Orientation	1
Coun515 Clinical Skills for Counselors	3
Elective (Practicum)	3
Elective	3
Total	60

## CONCENTRATION IN COLLEGE STUDENT PERSONNEL (CSP)

The concentration in College Student Personnel is designed to prepare students for counseling careers in higher education. It requires advanced coursework in career and lifestyle development, organization and administration of higher education, and college student development.

	Credit Hours
COUN 503 Orientation in Student Affairs	1
COUN 505 Helping Relationships	4
COUN 512 Counseling Theories	3
COUN 520 Introduction to Student Affairs	3
COUN 527 Student Affairs Administration	3
COUN 536 Assessment in Student Affairs	3
COUN 540 Group Process	4
COUN 545 Social & Cultural Foundations	3
COUN 552 Human Growth and Development	3
COUN 555 Student Development Theory	3
COUN 562 Today's College Student	3
COUN 601 CSP Internship 1	3
COUN 606 CSP Internship 2	3
COUN 610 Career and Lifestyle	3
COUN 615 Ethical & Legal Issues in Higher Ed	3
Total	45

# Design Management *Master of Professional Studies Degree*

*Chair:* Alex W. White  
Arnold Bernhard Center  
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alwhite@bridgeport.edu

Design is quickly moving to the center many organizations' core strategy. Such companies achieve a significant competitive advantage through the implementation of effective design thinking. New demands are being placed on designers, and new skills are needed to fully integrate into the business landscape of the 21st century.

Design Management is more than the study of business and design, it is a fundamental belief within an organization that design can improve productivity, create more innovative products, lower operational costs and create a more sustainable work environment. The field of Design Management encompasses every discipline of design, including graphic and communication; industrial design and engineering; architecture and interior; and fashion and textile design.

The MPS Design Management program at Shintaro Akatsu School of Design (SASD) emphasizes the following five core aspects of design and business:

## LEADERSHIP

Design Managers lead teams of designers, which requires a specific set of skills to develop the leadership style that's right for the individual and the team. Additionally, Design Managers are often asked to champion ideas throughout an organization. Both of these types of leadership skills are emphasized in this program, resulting in graduates with strong leadership skills.

## STRATEGY

Design and strategy are deeply connected. Design Managers who graduate from this program will be able to develop concepts that support and promote the core strategy of their organization, and articulate that strategy in a clear and persuasive way.

## MARKETING

Understanding the principles of marketing is critical to effective Design Management. Promotion, product design, package design, and the design of the physical plant often all fall under the responsibility of the Design Manager. Upon completing the

courses in this program, students will have working knowledge of these issues.

## OPERATIONS

Through interactive simulations and case study research, Design Management students gain a deep understanding of the operational procedures within an organization. The courses in this program help students identify, understand, and influence efficient operational practices.

## FINANCE

Students will be able to read and comprehend financial statements such as annual reports, cash flow statements, and balance sheets to more effectively integrate design proposals with business functions within their organization.

## LEGAL

Design Managers are often faced with the protection of intellectual property. The MPS DM program gives students a working knowledge for dealing with design issues of trademarks, copyrights, and patents.

These core skills will give Design Managers who graduate from SASD the tools they need to solve the most pressing design issues of our time, from matters of sustainability to social responsibility and profitability.

## Admissions Requirements

Applicants must possess an undergraduate degree in graphic, industrial, interior, or fashion design, architecture or related design or business fields from an accredited college or university with at least a 2.7/4.0 GPA.

Applicants should have a well-rounded education, as gained through general education courses.

Admissions will consider writing, speaking, and analytical skills, as demonstrated through college-level coursework or professional experience, although professional experience is not a prerequisite for admission.

Applicants must submit a personal essay and two letters of recommendation.

An interview is not required, but is recommended.

A portfolio is not required, but is an advantage in the admissions process.

Evidence of internship, volunteer, or prior employment in design management, mar-

keting, business or a studio settings will be viewed favorably.

Please visit Graduate Admissions for detailed information

<http://www.bridgeport.edu/admissions>.

## International Admissions

<http://www.bridgeport.edu/admissions/international/applying/requirements/graduate.aspx>

## Curriculum

### FIRST SEMESTER

DSNMG400	Collaborative Design Studio I	2
DSNMG410	Design Management I	3
MKTG 600	Marketing Concepts (Marketing)	3
MGMT 600 (Management)	Leadership & Management	3

### SECOND SEMESTER

DSNMG401	Collaborative Design Studio II	2
DSNMG410	Design Management II	3
BLAW 600 Ethics (Law)	Legal Environment of Business and	3
DSNMG599	Special Projects	2
DSNMG598	Internship or Coop (Elective*)	1-3

### THIRD SEMESTER

DSNMG500	Collaborative Design Studio III	2
DSNMG511	Design Management III	3
ACCT 600	Financial Accounting (Finance)	3
ITKM 600	Information Systems & Technology	3

### FOURTH SEMESTER

DSNMG501	Collaborative Design Studio IV	2
DSNMG511	Thesis/Design Management IV	3
MGMT 652 (Strategy)	Small Business & Entrepreneurship	3

*or*

DSNMG580X	New Product Commercialization	3
DSNMG598	Internship or Coop (Elective*)	1-3

*\*Alternate coursework is an additional graduate-level business course and requires permission of the academic advisor.*

# East Asian and Pacific Rim Studies *Master of Arts Degree*

Dean: Dr. Thomas J. Ward  
 Carlson Hall 235  
 Telephone: (203) 576-4966  
 Fax: (203) 576-4967  
 Email: ubcpia@bridgeport.edu

The Masters of Arts in East Asian and Pacific Rim Studies is designed for those anticipating a future career as a civil servant, a business professional or those planning to teach and research topics related to the Pacific Rim. The Pacific Rim includes the United States, China, Canada, Russia, Japan, the Koreas, Chile, the ASEAN countries and all other members of the Asia Pacific Economic Cooperation (APEC). The curriculum is designed to equip students with the necessary foundations in language, religion, political economy, culture and history that would allow students to have the bases needed to function effectively as a professional in the Pacific Rim. The program is interdisciplinary in nature. It requires a working knowledge of at least English and one East Asian language or Russian. The program emphasizes the development of skills in social science research methods, in political economy and an understanding of the religions, cultures and the major historical developments of the region. In addition to the core courses, students in the program will also develop expertise in one of four areas: Business, Global Communications, Diplomacy or Development.

## Learning Objectives

The program has the following learning Objectives:

- Introducing and comparing extant models of socioeconomic development with a special focus on those development models that have been used successfully in the Pacific Rim;
- Introducing the Sociopolitical Implications of the religions that are common in the Pacific region;
- Introducing and comparing models of trade;
- Equipping students with the quantitative and qualitative research skills needed to undertake effective planning, analysis and implementation of projects;
- Identifying and fostering an appreciation of the prerequisites for successful governance and amiable trade practices within developing countries;

- Development of skills in negotiation and in conflict resolution;
- Development of practical skills in problem solving and in project management through an internship in the Pacific Rim. US students will be expected to do their internship in Northeast or Southeast Asia and students from Asia will be encouraged to pursue an internship in Latin America or in a country other than their own in East Asia;
- Development of a at least a level 2 competency of an East Asian language (normally Chinese (Mandarin). Korean or Japanese or Russian.

The Masters Degree offers four potential tracks and students should choose from one of the following:

### CONFLICT ANALYSIS AND RESOLUTION TRACK (CULTURE, PEACE AND DEVELOPMENT)

For those interested in conflict management.

### INTERNATIONAL POLITICAL ECONOMY AND DEVELOPMENT TRACK

For those interested in development and its challenges.

### GLOBAL MANAGEMENT TRACK

For those interested in working in the commercial domain.

### GLOBAL COMMUNICATION

For those interested in working in the field of public diplomacy or media relations.

## Course of Study

Sample Curriculum Sequence:  
 Curriculum: East Asian and Pacific Rim Studies Program requires a minimum of 36 credit hours

### SEMESTER I

(For All Tracks)		
GLDP/EAPRS 501	Research Methods	3
GLDP/EAPRS 522	Conflict Analysis and Resolution	3
GLDP/EAPRS 528	Sociopolitical Implications of the World's Religions	3

### SEMESTER II

EAPRS 530	Pacific Rim Culture and Development	3
EAPRS 542	Political and Economic Integration of the Pacific Rim	3

### Concentration A: Negotiations and Diplomacy

Choose One		
GMCS 557	Political Communication and Governance	3
EAPRS 563	Business and Diplomacy—East Asia vs the West	3
GLDP 580	Advanced Diplomacy	3
One Course in one Concentration B, C or D		

### Concentration B: International Political Economy and Development

Choose One		
GLDP 560	Sustainable Development	3
EAPRS 525	Models of Good Governance in the Asia-Pacific Region	3
EAPRS 563	Business and Diplomacy—East Asia vs. the West	3

Or One Course in Concentration A, C or D if the student has not yet completed this requirement.

### Concentration C: Global Management Track

Choose One		
MGMT 530	Leadership, Teams & Managing Change	3
MGMT 539	International Issues	3
MKTG 560	Global Market Management*	3
One Course in Concentration A, B or D if the student has not yet completed this requirement		

### Concentration D: Global Communication Track

Choose One		
GMCS 537	Global Communication and Mass Media	3
GMCS 543	Communication and National Development	3
GMCS 557	Political Communication and Governance	3
One Course in Concentration A, B or C if not yet completed		

## SEMESTER III

EAPRS 591	Internship	3
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## SEMESTER IV

### Concentration A: Negotiations and Diplomacy

Choose Three		
GMCS 557	Political Communication and Governance	3
EAPRS 563	Business and Diplomacy—East Asia vs. the West	3
GLDP 580	Advanced Diplomacy	3
One Course in one Concentration B, C or D		

### Concentration B: International Political Economy and Development

Choose Three		
GLDP 560	Sustainable Development	3
EAPRS 525	Models of Good Governance in the Asia-Pacific Region	3
EAPRS 563	Business and Diplomacy—East Asia vs. the West	3

One Course in Concentration A, C or D if student has not yet completed this requirement

### Concentration C: Global Management Track

Choose Three		
MGMT 530	Leadership, Teams & Managing Change	3
MGMT 539	International Issues	3
MKTG 560	Global Market Management*	3
One Course in Concentration A, B or D if the student has not yet completed this requirement		

# East Asian and Pacific Rim Studies *Master of Arts Degree*

## Concentration D: Global Communication Track

Choose Three

EAPRS 537	Global Communication and Mass Media	3
GMCS 543	Communication and National Development	3
GMCS 557	Political Communication and Governance	3
One Course in Concentration A, B or C if not yet completed		3

## SEMESTER V

EAPRS 598	Tutorial	3
EAPRS 599	Thesis	3

## ENGLISH LANGUAGE REQUIREMENT

For applicants whose native language is not English, a minimum score of 213 (computer) or 550 (paper) on the TOEFL (Test of English as a Foreign Language) is required. Exception to these requirements will be considered on a case-by-case basis in consultation with the Director of the University's English Language Institute and following completion of an oral and written English exam that is administered by the English Language Institute. Students with demonstrated difficulty communicating in English may be required to take an advanced ELI course even if they have earned between 213/550 and 250/600 TOEFL scores.

## MINIMUM GRADE POINT AVERAGE REQUIREMENT

Candidates for the Masters of Arts in East Asian and Pacific Rim Studies are required to maintain a minimum semester grade point average of 3.0 to remain in good academic standing. The Master of Arts in East Asian and Pacific Rim Studies may only be conferred upon a student who has the minimum required average of a 3.0 at the conclusion of the student's studies. To receive credit for the completion of one of the tracks, a minimum of a "B" must be received in each course within the concentration. Students failing to maintain minimum academic standards will be placed on academic probation at the end of the first semester in which they do not maintain a semester or overall GPA of at least 3.0 or earn a C- or lower grade in any class. If the student fails to raise his overall GPA above a 3.0 by the end of the semester following being placed on academic probation, fails again to earn at least a 3.0 semester GPA or again earns a C- or lower grade in any class, she or he will be separated from the EAPRS program.

A student separated from the program may apply for readmission to the program following a minimum of one semester of not participating in the program. The student may only do this once.

# Education *Master of Science in Elementary or Secondary Degrees, Sixth Year Certificates of Advanced Studies, and Certification Areas*

*Dean:* Allen P. Cook  
Carlson Hall, Room 109  
Telephone: (203) 576-4192  
Fax: (203) 576-4200  
Email: [acook@bridgeport.edu](mailto:acook@bridgeport.edu)

This degree program provides advanced study in content and content pedagogy for persons interested in careers in education, and/or certification in the State of Connecticut to teach on the elementary, or secondary levels.

## **Intern Program**

*Intern Director:* Patricia Philips-Gorkowski  
Carlson Hall, Room 108  
Telephone: (203) 576-4219  
E-mail: [paphilli@bridgeport.edu](mailto:paphilli@bridgeport.edu)

The Graduate School of Education provides an internship option for the following students: (1) those seeking a Master's degree or 6th Year Certificate of Advanced Studies and teacher certification; (2) those already certified and seeking a Master's degree or Sixth Year Certificate of Advanced Studies, or (3) those seeking a Master's degree only for work in nonpublic American schools, schools in another country, or in other educational settings. This internship is designed to integrate field experience with graduate course work. During the internship students earn thirty-three tuition remission credits.

## **Master's Degree Program**

Master of Science in Elementary and Secondary Education

(Connecticut Teacher Certification)

This program provides educators with the opportunities for in-depth study of subject content, techniques and materials appropriate to contemporary classrooms within a structured framework of field concentration and professional development. Emphasis is placed on selected areas of concentration in content and content pedagogy and professional course work for the development of individual clinical competencies.

Individuals seeking Connecticut certification must take courses required for their license in a Master's Planned Program of Study. This program consists of foundation courses, subject content courses, professional courses, field experiences, and residency teaching.

The following certification tracks are avail-

able: Elementary content area courses; Secondary Academic Subjects: Biology, Physics, General Science, Chemistry, Earth Science, English, Mathematics, History and Social Studies, and Music (K-12).

## **Teacher Preparation Programs**

Candidates who seek certification to teach in Connecticut must follow a Planned Program of Study that results in a Master's Degree and a recommendation by the State Certification Officer at the University for an Initial Educator Certificate in the State of Connecticut.

## **Admissions into the Master's Degree (Certification Track Programs)**

Students seeking certification must apply to the program of their choice and must meet the following requirements PRIOR to admission into a Certification Track Program in Elementary, Secondary Academic Subjects, or Music:

1. A Bachelor's Degree in a subject area major (not professional education) from a regionally accredited institution with thirty-nine credits in general education, including course work in English, Mathematics, Natural Science, Social Studies, and World Language or Fine Arts (Grades below a C are NOT accepted for this category).
2. Passing scores on the PRAXIS I exams in Reading, Writing, and Mathematics or an official Essential Skills Test waiver based on required passing scores on the SAT, ACT, GRE, or La Prueba de Aptitud Académica.
3. Undergraduate GPA of at least a B.
4. A well-written essay, at least 350 words, describing the candidate's reasons for enrolling in the program and experience relevant to teaching and demonstrating the appropriate dispositions for becoming a teacher.
5. Two letters of recommendation from persons able to testify to the candidate's suitability as a prospective teacher and potential for graduate-level work.

Candidates seeking admission to the certification-track programs are expected to possess basic technology proficiencies, such as

word processing, sending and receiving e-mail messages, using the Internet, and the University's web based platforms.

All candidates for Connecticut State Certification must meet the following additional requirements prior to recommendation for certification:

1. Completion of all required Planned Program course work
2. Completion of all General Education (undergraduate requirements)
3. PRAXIS I (or waiver) and PRAXIS II examinations, as well as any additional state mandated assessments for specific certification areas
4. Demonstration of all state-required program competencies
5. Demonstration of the knowledge, skills, and dispositions for teaching in the program area, including successful completion of all performance assessments specific to the certification program.

## **Program Goals**

The Teacher Preparation Program Goals coincide with the six domain goals of the Connecticut Common Core of Teaching and the national States' Common Core of Teaching. The Teacher Preparation program at the University of Bridgeport seeks to develop teachers who can accomplish all of the following:

Understand and apply essential skills, central concepts, and tools of inquiry in their subject matter or field.

Promote student engagement, independence, and interdependence in learning by facilitating a positive learning community.

Plan and Implement instruction in order to engage students in rigorous and relevant learning and to promote their curiosity.

Use multiple measures to analyze student performance and to inform subsequent planning and instruction.

Maximize support for student learning by developing and demonstrating professionalism, collaboration with others, and leadership.

# Education *Master of Science in Elementary or Secondary Degrees, Sixth Year Certificates of Advanced Studies, and Certification Areas*

## Elementary Education, K-6, Certification Track Program

*Co-Chair:* Steven Rosenberg, Lori Noto  
 Email: srosenbe@bridgeport.edu,  
 lorinoto@bridgeport.edu

### Planned Program of Study

#### PRE-PROFESSIONAL REQUIREMENTS COURSEWORK

##### FOUNDATIONS OF EDUCATION – 3 credits (required)

EDUC 502 Philosophical Foundations of Modern Education	3
or EDUC 503 Differentiated Instruction: Building on Student Diversity	3

##### HUMAN GROWTH AND DEVELOPMENT – 3 credits (required)

EDUC 509 Psychological Foundations in Education	3
SPECIAL EDUCATION – 3 credits (required)	
EDUC 564 Education of the Exceptional Student	3

#### PROFESSIONAL EDUCATIONAL REQUIREMENTS

##### CURRICULUM AND METHODS OF TEACHING

##### METHODS AND MATERIALS – 6 credits (required) (TWO OF THE FOLLOWING)

EDUC 441C Methods and Materials in Teaching Mathematics	2
and EDUC 442C Methods and Materials in Teaching Social Studies	2
and EDUC 443C Methods and Materials in Teaching Science	2

##### LITERACY – 9 credits (required)

EDUC 440C Methods and Materials in Teaching Language Arts	3
EDUC 573 Early Literacy Instruction	2
and EDUC 574 Developmental Reading in the Elementary School	3

##### STATUTORY REQUIREMENTS – 1 credit (required)

EDUC 511 Statutory Requirements in Education	1
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##### FIELD EXPERIENCE/RESIDENCE TEACHING – 6 credits plus Supervised Residency Teaching

EDUC 450 Field Experience	6*
or EDUC 515C Internship — First Semester	3
and EDUC 516C Internship — Second Semester	3
and EDUC 548C Directed/Supervised Residence Teaching	6

PRAXIS II Examinations (required)  
 Connecticut Foundations of Reading Test (required)

#### ADDITIONAL GRADUATE COURSES AND ELECTIVES

##### Additional Graduate Coursework (Required if noted)

##### MATHEMATICS (Adviser approval is needed for this course.)

EDUC 399 College Math for Teachers	2
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##### LITERACY AND ENGLISH LANGUAGE LEARNING

EDUC 536C Children's Literature	3
EDUC 570 Instruction for the English Language Learner	1

##### UNITED STATES HISTORY

HIST 300 U.S. History for Teachers	3
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#### FINAL DEGREE REQUIREMENT

(Choose one; certification-track students must take PRAXIS II and Connecticut Foundations of Reading Test.)

##### EXAMINATIONS (required for certification)

PRAXIS II	
Connecticut Foundations of Reading Test	
EDUC 566 Contemporary Educational Problems II	3
EDUC 595 Thesis Research	3

##### Total Number of Credits

Master of Science degree is a minimum of 33 credits. (not including 6 credits for student teaching)

#### OTHER REQUIREMENTS FOR STATE OF CONNECTICUT CERTIFICATION

Additional Coursework for Certification (required if noted)

\*EDUC 450 may be taken in 2 semesters (3 credits each) or one semester at 6 credits.

## Masters of Science in Secondary Education, Certification Track Programs

### Planned Program of Study

#### PRE-PROFESSIONAL REQUIREMENTS COURSEWORK

##### FOUNDATIONS OF EDUCATION – 3 credits (required)

EDUC 502 Philosophical Foundations of Modern Education	3
or EDUC 503 Differentiated Instruction: Building on Student Diversity	3

##### HUMAN GROWTH AND DEVELOPMENT – 3 credits (required)

EDUC 509 Psychological Foundations in Education	3
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##### SPECIAL EDUCATION – 3 credits (required)

EDUC 564 Education of the Exceptional Student	3
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#### PROFESSIONAL EDUCATIONAL REQUIREMENTS

##### CURRICULUM AND METHODS OF TEACHING

##### Methods and Materials—Secondary Level – 3 credits (required)

(Students must take the Methods and Materials course specific to the certification area).	
EDUC 440J Methods and Materials in Teaching Language Arts	3
or EDUC 441J Methods and Materials in Teaching Mathematics	3
or EDUC 442J Methods and Materials in Teaching Social Studies	3
or EDUC 443J Methods and Materials in Teaching Science	3

##### CONTENT LITERACY & LITERATURE – 3 credits (required)

EDUC 575J Reading and Writing in the Content Areas	3
(Secondary English Education Program Students)—3 credits (required)	
EDUC 536J Adolescent Literature	3

##### STATUTORY REQUIREMENTS – 1 credit (required)

EDUC 511 Statutory Requirements in Education	1
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##### Supervised Residency Teaching

EDUC 450 Field Experience	6*
or EDUC 515J Internship	3
and EDUC 516J Internship	3
and EDUC 548J Directed/Supervised Residence Teaching	6

PRAXIS II

#### ADDITIONAL PROGRAM REQUIREMENTS

##### Additional Coursework Required if Noted

EDUC 500 Research and Report Writing	3
EDUC 570 Instruction for the English Language Learner	1
HIST 300 U.S. History for Teachers	3

#### FINAL DEGREE REQUIREMENT

##### EXAMINATIONS (required for certification)

PRAXIS II	
EDUC 566 Contemporary Educational Problems II	3
or	
EDUC 595 Thesis Research	3

##### Total Number of Credits

Master of Science degree is a minimum of 33 credits. (not including 6 credits of student teaching)

# Education *Master of Science in Elementary or Secondary Degrees, Sixth Year Certificates of Advanced Studies, and Certification Areas*

## OTHER REQUIREMENTS FOR STATE OF CONNECTICUT CERTIFICATION

Additional Coursework for Certification or Endorsement (required if noted)

\*EDUC 450 may be taken in 2 semesters (3 credits each) or one semester at 6 credits.

## Specific Subject Area Requirements for Secondary Certification

Each student must have the appropriate undergraduate coursework for the certification area. Students are advised to check with their academic advisor for all undergraduate and graduate certification requirements.

### BIOLOGY, CHEMISTRY, EARTH SCIENCE, GENERAL SCIENCE, OR PHYSICS

Chair: Nelson Ngoh  
Email: ngoh@bridgeport.edu

#### REQUIREMENTS

*Undergraduate major in certification area or 30 credits plus nine credits in related subject(s) in certification area*

EDUC 443J Methods/Materials, Teaching Science 3

Students need to complete all requirements on their Planned Programs of Study and pass all performance assessments.

### ENGLISH

Chair: Patricia Mulcahy-Ernt  
Email: mulcahy@bridgeport.edu

#### REQUIREMENTS

*English major or 30 credits plus nine credits in related subject(s)*

EDUC 440J Methods/Materials, Teaching Language Arts 3

EDUC 536J Adolescent Literature 3

EDMM 625 Teaching Writing in Classrooms 1

Students need to complete all requirements on their Planned Programs of Study and pass all performance assessments.

### MATHEMATICS

Chair: Allen P. Cook  
Email: acook@bridgeport.edu

#### REQUIREMENTS

*Mathematics major or 30 credits plus nine credits in related subject(s)*

EDUC 441J Methods/Materials, Teaching Mathematics 3

Students need to complete all requirements on their Planned Programs of Study and pass all performance assessments.

### MATH CONTENT – 12 credits (required)

MATH 401 Analysis I (EDMM 600B) 3

MATH 402 Analysis II (EDMM 600B) 3

MATH 407 Analysis III (EDMM 600B) 3

MATH 414 Numerical Analysis (EDMM 600B) 3

### HISTORY AND SOCIAL STUDIES

#### REQUIREMENTS

History major plus 18 credits in other social sciences; or major in Anthropology, Sociology, Political Science, Geography, Economics, plus 18 credits in history

EDUC 442J Methods/Materials, Teaching Social Studies 3

Students need to complete all requirements on their Planned Programs of Study and pass all performance assessments.

## Music Education, K-12, Certification Track

Chair: Frank Martignetti  
Email: fmartigni@bridgeport.edu

## Planned Program of Study

### FOUNDATIONS OF EDUCATION REQUIREMENTS COURSEWORK

EDUC 503 Differentiated Instruction: Building on Student Diversity 3

### HUMAN GROWTH AND DEVELOPMENT – 3 credits (required)

EDUC 509 Psychological Foundations in Education 3

\*These course requirements may be met by taking an appropriate undergraduate course with a grade of at least a "B," taken within the past five years.

EDUC 564 Education Students with Exceptionalities 3

### PROFESSIONAL EDUCATION REQUIREMENTS

#### Content Area Core:-- 9 credits (required)

MSED 435 Teaching and Learning of Music 3

MSED 543 Music in Elementary Schools 3

MSED 544 Music in Secondary Schools 3

#### Content Area Specialization: (8)

APM 400: Private Instruction (vocal/instr.) (1-2)

MSED 511: Conducting (3)

MSED 520: Group Instruction in Voice (3)  
MSED 521: Group Instruction in Strings (3)  
MSED 523: Group Instruction in Woodwinds(3)  
MSED 526: Group Instruction in Percussion (3)  
MSED 531: Lit. & Tech. for Choral Music (3)  
MSED 532: Lit. & Tech. for Instr. Music (3)  
MSED 541: Choral Practicum (1)  
MSED 542: Instrumental Practicum (1)  
MSED 545: Technology in Music Education (3)  
MSED 546: Music in Early Childhood (3)

### FIELD EXPERIENCE/STUDENT TEACHING – 4 credits plus Student Teaching

EDUC 450 Field Experience 4\*  
or EDUC 515 Internship 2  
and EDUC 516 Internship 2  
and MSED 590 Directed/Supervised Resident Teaching, Music 6

### ADDITIONAL PROGRAM REQUIREMENTS

#### STATUTORY REQUIREMENTS – 1 credit (required)

EDUC 511 Statutory Requirements 0

#### Content Literacy – 3 credits (required)

EDUC 575M Reading and Writing in the Content Areas 3

#### FINAL DEGREE REQUIREMENT

#### EXAMINATIONS (required for certification)

PRAXIS II  
EDUC 566 Contemporary Educational Problems II 3  
EDUC 595 Thesis Research 3

#### Total Number of Credits

Master of Science degree is a minimum of 33 credits (not including 6 credits of student teaching)

### OTHER REQUIREMENTS FOR STATE OF CONNECTICUT CERTIFICATION

#### Survey Course of United States History – 3 credits (required)

Additional Coursework for Certification or Endorsement (required if noted)

\*EDUC 450 may be taken in 2 semesters (2 credits each) or one semester at 4 credits.

# Education *Master of Science in Elementary or Secondary Degrees, Sixth Year Certificates of Advanced Studies, and Certification Areas*

## **Master of Science in Elementary or Secondary Education, Certification Track Program in Remedial Reading and Remedial Language Arts**

Chair: Patricia Mulcahy-Ernt  
Email: mulcahyp@bridgeport.edu

This 33 credit Master of Science degree course of study program at either the Elementary or Secondary level provides extensive course work and experiences in working with students in the field of literacy and language arts, leading to the initial educator certification in Remedial Reading and Remedial Language Arts. An individual with an appropriate regionally accredited Bachelor's degree may apply for this program. Although the program focuses on literacy for grades 1-12, the candidates elect either an Elementary degree focus or a Secondary degree focus through their field experiences and research. This concentration focuses on working with students in a variety of instructional settings for the purpose of teaching literacy processes, for evaluating students in reading and language arts, and for developing and evaluating literacy programs. Students learn to create appropriate literacy instruction for learners experiencing difficulty in reading and language arts. Upon completion of the coursework, field experiences, and appropriate performance assessments, students may apply for the Connecticut initial educator certificate in Remedial Reading/ Remedial Language Arts, 1-12.

### **Program Goals**

The program goals in literacy are adapted from the international Reading Association Standards for reading Professionals - Revised 2010. The goals in Literacy for the Remedial Reading and Remedial Language Arts Program are as follows:

1. Reading professionals understand the theoretical and evidence-based foundations of reading and writing processes and instruction.
2. Reading professionals use instructional approaches, materials, and an integrated, comprehensive, balanced curriculum to support learning in reading and writing.
3. Reading professionals use a variety of assessment tools and practices to plan and

evaluate effective reading and writing instruction.

4. Reading professionals create and engage their students in literacy practices that develop awareness, understanding, respect, and a valuing of differences in our society.
5. Reading professionals create a literate environment that fosters reading and writing by integrating foundational knowledge, instructional practices, approaches and methods, curriculum materials, and the appropriate use of assessments.
6. Reading professionals recognize the importance of, demonstrate, and facilitate professional learning and leadership as a career-long effort and responsibility.

### **Admissions Criteria**

1. A valid Connecticut teaching certificate (or proof of eligibility);
2. An appropriate regionally accredited Bachelor's degree;
3. At least two letters of recommendation from persons able to testify to your suitability as a prospective teacher and your potential for graduate-level work;
4. An essay demonstrating a command of the English language and setting out the reasons for wanting to enroll in the program and emphasizing experience relevant to teaching;
5. A successful team interview with faculty;
6. Completion of at least 30 school months of successful classroom teaching experience.
7. Connecticut's essential skills testing requirements: passing scores in the PRAXIS I exams in Reading, Writing, and Mathematics or an official essential skills test waiver currently meeting this requirement.

### **Planned Program of Study**

#### **PREREQUISITE REQUIREMENTS**

Foundations of Education	3
Educational Psychology	3
Children's or Adolescent Literature	3
Special Education	3

#### **PROFESSIONAL EDUCATION REQUIREMENTS**

##### **READING AND LANGUAGE ARTS – 8 credits (required)**

EDUC 440C	Methods and Materials in Teaching Language Arts	3
or EDUC 440M/J	Methods and Materials in Teaching Language Arts	3
and EDUC 574	Developmental Reading in the Elementary School	3
and EDUC 575	Reading and Writing in the Content Area	3

##### **DIAGNOSIS AND REMEDIATION OF READING AND LANGUAGE ARTS DIFFICULTIES – 3 credits (required)**

EDUC 571	Diagnosis and Intervention of Reading and Language Arts Difficulties	3
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##### **TESTS AND MEASUREMENTS – 3 credits (required)**

EDUC 558	Evaluation of Instructional Outcomes	3
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##### **CLINICAL PRACTICES IN READING AND LANGUAGE ARTS – 7 credits (required)**

EDUC 596	Field Experience in Reading and Language Arts	1
EDUC 597	Practicum in Reading and Language Arts	6

#### **ADDITIONAL PROGRAM REQUIREMENTS**

##### **SECOND LANGUAGE LEARNING AND ACQUISITION – 1 credits (required)**

EDUC 570	Instruction for the English Language Learner	1
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##### **ADDITIONAL GRADUATE COURSEWORK (required if noted)**

EDUC 500	Research and Report Writing	3
EDUC 515	Internship	3
EDUC 516	Internship	3
EDUC 570	Instruction for the English Language Learner	3
EDUC 573	Early Literacy Instruction	2

#### **FINAL DEGREE REQUIREMENT**

(Choose one of the following:)

EDUC 566	Contemporary Educational Problems II	3
EDUC 568	Studies in Literacy Research	1
or EDUC 595	Thesis Research	2-6

#### **ADDITIONAL COURSEWORK FOR CERTIFICATION**

(required if Noted)

##### **Total Number of Credits**

M.S. Total Minimum: 33 credits

Students need to complete all requirements on their Planned Programs of Study and pass all performance assessments.

# Education *Master of Science in Elementary or Secondary Degrees, Sixth Year Certificates of Advanced Studies, and Certification Areas*

## **Professional Educator Development**

### **Master of Science in Elementary or Secondary Education/Certificate of Advance Studies (CAS) in Elementary or Secondary Education**

*Chair:* Norma Atkinson  
Carlson Hall, Room 108  
Telephone: (203) 576-4028  
Fax: (203-576-4200  
Email: natkinso@bridgeport.edu

This degree program provides advanced study for certified teachers and for persons interested in careers related to school-age students.

## **Professional Educator Development**

This program is designed for students who are certified teachers or who wish to pursue a Master's degree in Elementary or Secondary Education (33 credits); or 6th year (30 credits) Certificate of Advanced Studies in Elementary or Secondary Education.

### **PROGRAM REQUIREMENTS**

The Professional Educator Development Program combines a basic core with selected courses.

### **CORE COURSES**

In the Research and Report Writing course (3 credits), students analyze their own school experiences and determine competencies they wish to achieve. In the Differentiated Instruction course (3 credits), methods for addressing the needs of students' diverse strengths, background, experiences, gender, linguistic, and learning styles will be presented. In the Teacher Leadership course (3 credits), methods to maximize students' learning potential, and provide students with quality learning experiences, alignment of standards, lessons and assessments. In the final core requirement, Contemporary Problems in Education (3 credits) students demonstrate those competencies in a clinical and a research setting.

### **ELECTIVE COURSE TOPICS**

Courses are offered in the following topics for a total of 30 or 33 credits, with several courses available under each topic. For courses offered each semester, consult the course schedule. On ground, online and hybrid formats available. Depending on availability and course scheduling, candidates may choose from among the following (courses vary between one and three credits):

EDUC:	Course Description
450	Field Experience
515	Clinical Experience – Internship Program
EDMM:	Course Description
606	No room for Bullying
609	Small Group Instruction
610	Technology Integration
617	Development and Design of Blended Learning Instructional Modules
618	Technology Literacy
619	Web Quest in Interactive Classroom
620	Applications of English Grammar
623	Interactive Reading/Balanced Literacy
624	Literacy Lessons - CMT
626	Principles of Early Childhood Education
627	Developmentally Appropriate Classrooms
628	Family and Community Partnerships
632	Dynamics of Classroom Environment
633	Critically Reflecting on Practice
634	Conflict Resolution
641	Identifying & Teaching Academically Gifted
642	Differentiated Instruction
643	The Art of Teaching Boys & Girls Differently
644	Character Education
645	Student Centered Instruction
646	Reaching Difficult Students
654	Mastering the Interview Process
655	Positive Student/Teacher Relationships
669	Mysteries of the U.S - Historical
670	Instructing with Modern Media
671	Using Historical Fiction
672	Urban Education
679	Using STEM in the Classroom
687	Inquiry Learning Across Disciplines
688	Curriculum Writing and Revision
692	Teacher Leadership
693	School Law
694	A Practical Guide to CCT
699	Testing & Assessment Strategies in Education

## **Education M.S. Degree – Early Childhood Education Concentration**

### **Designed for Flexibility – Online, On-Campus, or Hybrid/ Blended**

The M.S. degree with a concentration in Early Childhood Education is designed to promote quality early childhood education for all young children, birth through age twelve, and to improve professional practice in the early childhood community. This non-certification concentration offers coursework in various formats: online, on campus or hybrid/ blended courses.

Our planned program supports a comprehensive understanding of the diverse cognitive, cultural, developmental, and linguistic needs of the early childhood learner. Graduates will be able to work effectively with multicultural populations of young children in a variety of settings and provide instructional opportunities that are adapted to diverse learning styles. In addition, our graduates are trained to use developmentally appropriate practices in early childhood education to create healthy, respectful, nurturing, and challenging learning environments for all young children in their cultural contexts.

### **PROGRAM REQUIREMENTS**

#### **Education M.S. Degree (33 Credits) Early Childhood Concentration**

EDMM 626	Principles of Early Childhood Education (ECE)	3 online
EDMM 657	Developmentally Appropriate ECE Classroom Environments	3 online
EDMM 628	Family and Community Partnerships within ECE	3 online
EDUC 560	Human Growth and Development	3 online
Total Core Courses		12

*The remaining 21 credits will be individually selected with the assistance of the student's advisor.*

# Education Sixth Year Certificate of Advanced Study (CAS) in Elementary or Secondary Education Remedial Reading and Language Arts

*Chair:* Patricia Mulcahy-Ernt  
Carlson Hall, Room 118  
Telephone: (203) 576-4201  
Fax: (203) 576-4200  
Email: mulcahyp@bridgeport.edu

This 30 credit Sixth Year Certificate of Advanced Study (CAS) degree program at either the Elementary or Secondary level provides extensive course work and experiences in working with students in the field of literacy and language arts. An individual with an appropriate regionally accredited Master's degree may use the 6th Year CAS degree program to achieve teacher certification.

Although the program focuses on literacy for grades 1-12, the candidates elect either an Elementary degree focus or a Secondary degree focus through their field experiences and research. This concentration focuses on working with students in a variety of instructional settings for the purpose of teaching literacy processes, for evaluating students in reading and language arts, and for developing and evaluating literacy programs. Students learn to create appropriate literacy instruction for learners experiencing difficulty in reading and language arts. Upon completion of the coursework, field experiences, and appropriate performance assessments, students may apply for the Connecticut initial educator certificate in Remedial Reading/Remedial Language Arts, 1-12.

## Program Goals

The program goals in literacy are adapted from the international Reading Association Standards for reading Professionals - Revised 2010. The goals in Literacy for the Remedial Reading and Remedial Language Arts Program are as follows:

1. Reading professionals understand the theoretical and evidence-based foundations of reading and writing processes and instruction.
2. Reading professionals use instructional approaches, materials, and an integrated, comprehensive, balanced curriculum to support learning in reading and writing.
3. Reading professionals use a variety of assessment tools and practices to plan and evaluate effective reading and writing instruction.
4. Reading professionals create and engage their students in literacy practices that develop awareness, understanding,

respect, and a valuing of differences in our society.

5. Reading professionals create a literate environment that fosters reading and writing by integrating foundational knowledge, instructional practices, approaches and methods, curriculum materials, and the appropriate use of assessments.
6. Reading professionals recognize the importance of, demonstrate, and facilitate professional learning and leadership as a career-long effort and responsibility.

## Admissions Criteria

1. A valid Connecticut teaching certificate (or proof of eligibility);
2. An appropriate regionally accredited Master's degree;
3. At least two letters of recommendation from persons able to testify to your suitability as a prospective teacher and your potential for graduate-level work;
4. An essay demonstrating a command of the English language and setting out the reasons for wanting to enroll in the program and emphasizing experience relevant to teaching;
5. A successful team interview with faculty;
6. Completion of at least 30 school months of successful classroom teaching experience.
7. Connecticut's essential skills testing requirements: passing scores in the PRAXIS I exams in Reading, Writing, and Mathematics or an official essential skills test waiver currently meeting this requirement.

In this program students gain extensive preparation in learning to teach students in reading and language arts; to work with learners experiencing difficulty in reading, writing, and literacy-related processes; to assess literacy development; and to develop and evaluate programs that improve literacy processes.

## PREREQUISITE REQUIREMENTS\* (9 CREDITS)

### EDUCATIONAL PSYCHOLOGY – 3 credits (required)

EDUC 509 Psychological Foundations in Education 3

### CHILDREN'S OR ADOLESCENT LITERATURE – 3 credits (required)

EDUC 536C Children's Literature 3

or EDUC 536J Adolescent Literature 3

## SPECIAL EDUCATION – 3 credits (required)

EDUC 564 Education of the Exceptional Student 3

## PROFESSIONAL EDUCATION REQUIREMENTS\*\*

### READING AND LANGUAGE ARTS - 9 CREDITS (REQUIRED)

EDUC 440C Methods and Materials in Teaching Language Arts 3

or EDUC 440M/J Methods and Materials in Teaching Language Arts 3

and EDUC 574 Developmental Reading in the Elementary School 3

and EDUC 575M/J Reading and Writing in the Content Areas 3

### DIAGNOSIS AND REMEDIATION OF READING AND LANGUAGE ARTS DIFFICULTIES – 3 credits (required)

EDUC 571 Diagnosis and Intervention of Reading and Language Arts Difficulties 3

### TESTS AND MEASUREMENTS – 3 credits (required)

EDUC 558 Evaluation of Instructional Outcomes 3

### CLINICAL FIELD EXPERIENCES – 7 credits (required)

EDUC 596 Field Experience in Reading and Language Arts 1

EDUC 597 Practicum in Reading and Language Arts 6

## ADDITIONAL PROGRAM REQUIREMENTS (4-12 CREDITS)

### SECOND LANGUAGE LEARNING AND ACQUISITION (required as noted)

EDUC 570 Instruction for the English Language Learner 1

### STATUTORY REQUIREMENTS (required as noted)

EDUC 511 Statutory Requirements in Education 1

### ADDITIONAL GRADUATE COURSEWORK (required as noted)

EDUC 573 Early Literacy 2

## FINAL DEGREE REQUIREMENT

(CHOOSE ONE OF THE FOLLOWING:)

### INDEPENDENT STUDY

EDUC 668 Literacy Research Project 1

EDUC 669 Sixth Year Project 1-3

### THESIS RESEARCH

EDUC 695 Advanced Thesis Research — Sixth Year 2-6

## Credits for Certification

21  
Students need to complete all requirements on their Planned Programs of study. Students seeking to complete the Sixth Year Degree must complete an additional 9 credits, inclusive of the Final Degree Requirement.

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**Education** *Sixth Year Certificate of Advanced Study (CAS) in Elementary or Secondary Education*  
Remedial Reading and Language Arts

**Total Number of Credits:**

Sixth Year degree Total Minimum: 30 Credits

\*With prior written adviser approval these courses may be met by taking undergraduate courses with a grade of a "B" or higher.

\*\*These courses are required for the Sixth Year Certificate Program in Remedial Reading and Remedial Language Arts.

# Education Sixth Year Certificate of Advance Studies (CAS) with Reading and Language Arts Consultant Certification

*Chair:* Patricia Mulcahy-Ernt  
 Carlson Hall, Room 118  
 Telephone: (203) 576-4201  
 Fax: (203) 576-4200  
 Email: mulcahy@bridgeport.edu

The Reading and Language Arts Consultant is a Teacher Certification Program designed to prepare educators for leadership positions in elementary, middle, and secondary schools. The program prepares the student for the roles of a curriculum and instructional leader, including the following: organizing, supervising, and enhancing literacy programs; coordinating the instruction and assessment of students in reading and language arts; guiding, improving, and enriching reading and language arts instruction in all content areas; and collaborating with teachers, administrators, parents, and other literacy leaders.

Applicants must have completed an appropriate Master's degree, must have a valid teaching certificate (or be eligible for Connecticut certification) in elementary, middle, or secondary education; must have completed a minimum of thirty months of successful classroom teaching experience; and must have completed all state required tests, including the Connecticut Foundations of Reading Test. Upon the completion of the Planned Program with appropriate coursework, field experiences, performance assessments, and the demonstration of required certification competencies, a student may apply for the Reading and Language Arts Consultant certification.

## Program Goals

The program goals in literacy are adapted from the international Reading Association Standards for reading Professionals - Revised 2010. The goals in Literacy for the Reading and Language Arts Consultant Program are as follows:

1. Reading professionals understand the theoretical and evidence-based foundations of reading and writing processes and instruction.
2. Reading professionals use instructional approaches, materials, and an integrated, comprehensive, balanced curriculum to support learning in reading and writing.
3. Reading professionals use a variety of assessment tools and practices to plan and evaluate effective reading and writing instruction.

4. Reading professionals create and engage their students in literacy practices that develop awareness, understanding, respect, and a valuing of differences in our society.
5. Reading professionals create a literate environment that fosters reading and writing by integrating foundational knowledge, instructional practices, approaches and methods, curriculum materials, and the appropriate use of assessments.
6. Reading professionals recognize the importance of, demonstrate, and facilitate professional learning and leadership as a career-long effort and responsibility.

## Admissions Criteria

1. A valid Connecticut teaching certificate (or proof of eligibility);
2. An appropriate regionally accredited Master's degree;
3. At least two letters of recommendation from persons able to testify to your suitability as a prospective teacher and your potential for graduate-level work;
4. An essay demonstrating a command of the English language and setting out the reasons for wanting to enroll in the program and emphasizing experience relevant to teaching;
5. A successful team interview with faculty;
6. Completion of at least 30 school months of successful classroom teaching experience.
7. Connecticut's essential skills testing requirements: passing scores in the PRAXIS I exams in Reading, Writing, and Mathematics or an official essential skills test waiver currently meeting this requirement.
8. Passing scores on the Connecticut Foundations of Reading Test.

### PREREQUISITE REQUIREMENTS\*

\*THESE REQUIREMENTS MAY BE MET BY TAKING AN UNDERGRADUATE OR GRADUATE COURSE WITH A GRADE OF AT LEAST A "B."

#### EDUCATIONAL PSYCHOLOGY – 3 credits (required)

EDUC 509	Psychological Foundations in Education	3
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#### CHILDREN'S OR ADOLESCENT LITERATURE – 3 credits (required)

EDUC 536C	Children's Literacy	3
or EDUC 536J	Adolescent Literacy	3

#### SPECIAL EDUCATION – 3 credits (required)

EDUC 564	Education of the Exceptional Student	3
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#### TESTS AND MEASUREMENTS – 3 credits (required)

EDUC 558	Evaluation of Instructional Outcomes	3
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#### CURRICULUM: METHODS AND MATERIALS IN TEACHING LANGUAGE ARTS – 3 credits (required)

EDUC 440C	Methods and Materials in Teaching Language Arts	3
or EDUC 440M/J	Methods and Materials in Teaching Language Arts	3

#### SECOND LANGUAGE LEARNING AND ACQUISITION – 1 credit (required)

EDUC 570	Instruction for the English Language Learner	1
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Total Credits 16

## INITIAL PROGRAM REQUIREMENTS

(The initial program requirements may be met through completion of the following courses at the Master's or Sixth Year level:)

#### DEVELOPMENTAL READING – 6 credits (required)

EDUC 574	Developmental Reading in the Elementary School	3
and EDUC 575M/J	Reading and Writing in the Content Areas	3

#### DIAGNOSIS AND REMEDIATION OF READING AND LANGUAGE ARTS DIFFICULTIES – 3 credits (required)

EDUC 571	Diagnosis and Intervention of Reading and Language Arts Difficulties	3
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#### CLINICAL FIELD EXPERIENCE – 7 credits (required)

EDUC 596	Field Experience in Reading and Language Arts	1
EDUC 597	Practicum in Reading and Language Arts	6
Total Credits		<u>16</u>

## ADVANCED PROGRAM REQUIREMENTS

#### ADVANCED READING AND LANGUAGE ARTS DIAGNOSIS – 2 credits (required)

EDUC 572	Advanced Diagnosis of Reading and Language Arts Difficulties	2
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#### ORGANIZATION, ADMINISTRATION, AND SUPERVISION OF READING – 4 credits (required)

EDLD 611	Administration: Organizing and Staffing Educational Institutions	3
or EDLD 613	Leadership	3
EDLD 611A	Organization, Administration, and Supervision of Reading and Language Arts Programs	1

#### READING AND LANGUAGE ARTS CONSULTANT PRACTICUM AND APPLIED RESEARCH – 6 credits (required)

EDLD 683	Internship for the Reading & Language Arts Consultant	6
Total Credits		<u>12</u>

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# Education *Sixth Year Certificate of Advance Studies (CAS) with Reading and Language Arts Consultant Certification*

## **ADDITIONAL PROGRAM REQUIREMENTS** \_\_\_\_\_

### **FINAL DEGREE REQUIREMENT** *(Choose one of the following:)*

EDUC 668	Literacy Research Project	1
EDUC 669	Sixth Year Project	3
or		
EDUC 695	Advanced Thesis Research— Sixth Year	3

### **ADDITIONAL COURSEWORK FOR CERTIFICATION** *(required if Noted)*

#### **Total Number of Credits**

Sixth Year Total Minimum: 30 credits

# Educational Administration and Supervision Sixth Year Certificate of Advanced Study (CAS), Intermediate Administrator (092 Certification) Certification Track

*Chair and Director:* Gail Prelli  
Carlson Hall, Room 101  
Telephone: (203) 576-4218  
Fax: (203) 576-4200  
Email: emargoli@bridgeport.edu

## Program Goals

The Educational Leadership with Administration and Supervision Program Goals are adapted from Connecticut State Department of Education's common Core of Leading (2013). The Educational Leadership with Administration and Supervision program at the University of Bridgeport seeks to develop leaders who can accomplish all of the following:

1. Develop a shared vision for student learning that creates meaning for the people in the organization and infuses purpose into the strategies and standards for actions linked to that vision.
2. Promote an instructional program, built on high expectations for all learners and conducive to student learning and professional growth, thereby developing a school culture of success for all learners.
3. Establish positive learning environments by developing trust and credibility through meaningful relationships.
4. Establish a culture that is open and inclusive, through modeling and expecting ethical and moral behaviors from all.

A student who holds a Master's degree from an accredited college or university may apply to in the Sixth Year program. The Professional Diploma program consists of thirty semester hours.

The Sixth Year Program, leading to the professional Diploma in Educational Leadership with Administration and Supervision, is designed to meet requirements leading to administrator and supervisor certification (092). This Connecticut State Certification enables a candidate to apply for leadership positions other than Superintendent of Schools (093 certification). With the exception of Reading and Language arts, this certification would also include subject area consultant and curriculum coordinator.

## Intermediate Administrator (092 Certification) Certification Track

### Summary of Requirements

(30 SEMESTER HOURS)

**CERTIFICATION REQUIRES COURSES IN EACH OF THE FIVE AREAS, AND A TOTAL OF 24 CREDITS BEYOND THE MASTER'S \_\_\_\_\_**

#### REQUIRED CORE \_\_\_\_\_

##### I. PSYCHOLOGICAL/PEDAGOGICAL

\*EDLD 621 Evaluation of School Effectiveness

##### II. CURRICULUM/PROGRAM MONITORING

\*EDLD 651 Curriculum Development

##### III. SCHOOL ADMINISTRATION

EDLD 618 School Finance (required)

EDLD 619 School Law (required)

##### IV. PERSONNEL EVALUATION/SUPERVISION

EDLD 652 Supervision: Evaluation/Development

##### V. CONTEMPORARY EDUCATIONAL PROBLEMS/POLICY MAKING

EDLD 601 Introduction to Education Leadership

#### Notes:

1. Administrative Internship ED. 681A (3 credits) required
2. CAT Examination – required for 092 certification
3. EDUC 664 Supervision of Programs & Services for students with Exceptionalities (This requirement will be substituted for an elective if the candidate holds appropriate certification Social Work, Speech, Psychology, Special Ed.).  
Must be completed for certification.
4. Certification (092) = 24 credits
5. 6th Year professional Diploma = 30 credits

#### SUGGESTED ELECTIVES (3 Credits each) \_\_\_\_\_

EDLD 613 Contemporary Issues in Education  
Leadership

EDLD 614 Leadership & Management of School  
Facilities

EDLD 680A Urban Leadership

EDLD 615 Research & Data Informed Supervision

Electives offered by other departments or colleges, may be substituted with approval by the student's advisor.

**Total Semester Hours \_\_\_\_\_ 30**

# Educational Leadership *Doctor of Education Degree*

*Program Director:* Thomas Christ

Carlson Hall, Room 116

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Fax: (203) 576-4200

Email: tchrist@bridgeport.edu

The Doctoral program in Educational Leadership at the University of Bridgeport is the first of its kind in Connecticut and has been operating since 1979. It is designed to enhance and improve the effectiveness of public and private organization leaders, school administrators, and researchers. Graduates and current students have held and hold significant positions in state-wide school systems, for-profit, non-profit institutions, colleges, and universities. The advanced graduate curriculum integrates the sound principles of administration, management, organizational psychology, information technology, program evaluation, quantitative, qualitative, action, and mixed research methodologies.

The program is specifically tailored to the working professional and is offered on a part-time basis (two evenings per week) at the U.B. Campus. Consequently, all courses and seminar are conveniently scheduled around the job of the working professional. The successful completion of the program leads to the Doctor of Education degree (Ed.D.).

The Doctoral Program takes into consideration the needs of such personnel in terms of both the content of the curriculum, orientation, and program organization. It is offered at the University of Bridgeport campus easily accessible from New York, New Jersey, and Massachusetts by car, train, or ferry.

The program requires a minimum of four years for completion, including three years of formal study, and a minimum of one year to complete the dissertation. During the first two years, students typically take one six credit doctoral seminar and one three credit research-evaluation course per semester. Students should take online-hybrid classes during year one and two summers as part of the residency requirement in the program.

## 1. Summary of Requirements

(62 SEMESTER HOURS)

### **Educational Leadership Strand**

EDLD 801 Program Development (6 Credits)

EDLD 804 Constitutional Law (6 Credits)

EDLD 805 Grant Writing, Procurement, and Policy (6 Credits)

EDLD 807 Organization Management (6 Credits)

EDLD 808 Human Relations (6 Credits)

### **Research and Evaluation Strand**

EDLD 811 Intro to Research (3 Credits)

EDLD 812 Quantitative Research (3 Credits)

EDLD 814 Qualitative Research (3 Credits)

EDLD 815 Mixed Methods (3 Credits)

EDLD 816 Action Research Project (3 Credits Repeatable up to 2X)

### **Dissertation Preparation Strand**

EDLD 813 Literature Review (3 Credits)

EDLD 845 Dissertation: Comprehensive Exam (3 Credits)

EDLD 846 Dissertation: Proposal Defense (3 Credits)

EDLD 850 Continuous Dissertation (0 Credits)

### **Postsecondary Teaching Experience**

EDLD 817 Postsecondary Teaching (2 Credits Repeatable up to 4X)

### **For 092 Certification Add**

EDLD 881a Administrative Internship (3 credits) + CAT Exam

EDLD 864 Special Education for Administrators (3 Credits)

## 2. Residency

A substantial period of residence must be included in a doctoral program to provide significant faculty-student interaction, opportunities for exposure to and engagement with cognate disciplines and research scholars working in those disciplines, and significant face-to-face peer interaction among graduate students. Residency is established through continuous enrollment, fall, spring, and summer with a minimum of 3 credits per semester. Residency provides the opportunity for a mentor-apprentice relationship between faculty and students and time for in-depth and direct faculty support of students. Thus, the intent of the residency requirement is to ensure that doctoral students contribute to and benefit from the complete spectrum of educational, professional, and enrichment opportunities provided on and off the University of Bridgeport campus.

## 3. Dissertation Preparation

The dissertation proposal draft is a 12-15 page overview of the student's ideas for their dissertation. The proposal draft which is created in the first year of the program as part of EDLD 811-Introduction to Research, EDLD 812-Quantitative Research, and EDLD-813-Literature Review should provide guidance for the selection of dissertation committee members as well as a basis for further expansion of the dissertation methodology and procedures which occurs in EDLD 814-Qualita-

ive Research and EDLD 815-Mixed Methods Research. The purpose for the dissertation proposal draft is to state the problem, purpose, research questions, methodology, and procedures to conduct the research project. The proposal draft will include a graphic depiction of the methodology and methods, and a time line for completion of the dissertation proposal including literature review and Human Subject approval. Discussing the research proposal in draft format with a potential committee chair, other potential committee members, and peers will enable the student to obtain advice early in the dissertation process as to the suitability of the topic and as to whether or not the research questions and methodologies are logical, appropriate, and sound.

## 4. Comprehensive Examination and Dissertation Proposal

All matriculated doctoral students wishing to become doctoral candidates must pass a written comprehensive examination. Passage of the comprehensive exam coincides with the final dissertation proposal. The comprehensive exam will consist of: (a) one research methodological question; (b) one program focus question; and (c) one area of specialization question related to the students' dissertation topic. The questions will be designed by the doctoral faculty and the student to rigorously assess the mastery and synthesis of knowledge garnered during coursework. Further, it is intended to gauge the student's potential for independent dissertation research. Students should take the exam at the conclusion of their third year, after all coursework has been completed. Students will have 30 days to complete the take home comprehensive exam. Each question should be 15 pages with no less than 15 appropriate citations per question representing coursework in the program, and the students' research in their specialization strand. Following APA 6th edition is mandatory!

The dissertation proposal is a required component of the doctoral program, and must be approved for a student to become a doctoral candidate. The student, the student's Chair, and the School of Education expect to see evidence of careful attention to APA 6th style and format in the proposal document. The UB Doctoral Guidelines are derived from standard practices among universities, libraries, and publishers. The student is expected to read and follow the Guidelines through-

## Educational Leadership *Doctor of Education Degree*

out the proposal preparation. The proposal includes the student's statement of a research problem and the chosen method of investigating it. The proposal is the first step toward completion of the dissertation, which is an original contribution to one's field of study. The study may be applied research; it may be experimental, quasi-experimental, or non-experimental in its design; it may include quantitative, qualitative, action, mixed or critical methodology. Writing the dissertation proposal begins immediately upon entering the Ed.D. program guided by a unique sequence of six 3-credit courses (EDLD: 811, 812, 813, 814, 815, 816). It is essential that the student be capable of discussing the theoretical basis of a proposed study and the specific methodologies and is approved by IRB and the dissertation committee before the student begins formal data collection. A proposal draft should contain the following headings:

### **5. Dissertation-Doctoral Candidacy**

Once the student has successfully passed the Comprehensive Examination and completed the Dissertation Proposal, he or she is eligible to apply to be a Doctoral Candidate. The student should submit the form "Admission to Doctoral Candidacy" to the Director. This designation will be conveyed to the student by an official letter from the School of Education and/or the Department of Educational Leadership. Doctoral Candidacy allows the student to register for dissertation advising EDLD 850 which is a 0 credit course but is deemed to be full time. A student must be a candidate for at least two semesters prior to the granting of the degree. Student may not, unless granted a waiver, defend the dissertation during the semester immediately following the semester during which he or she completed the proposal. The purpose of this requirement is to assure a minimal lapse of time for effective work on the dissertation after acquisition of the basic competence and after delineation and approval of the research problem and methodology. Once students are advanced to candidacy they must be enrolled in EDLD 850 continuously for dissertation advising and supervision (fall, spring and summer semesters) until graduation. If the student is not advanced to candidacy within six years from the time of admission to the doctoral program, the student should be dismissed from the program. Each student has a three-member dissertation

committee, the director of the Ed.D. Program, and the Dean of School of Education.

### ***Note: Completion of Doctoral Degree***

The degree must be completed within seven years of the date from which the student started coursework in the doctoral program. In exceptional cases, the department may recommend that the Dean grant an extension of this limit.

# Electrical Engineering *Master of Science Degree*

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*Chair:* Navarun Gupta  
Engineering Technology Building  
Telephone: (203) 576-4117  
Fax: (203) 576-4750  
Email: navarung@bridgeport.edu

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This Program is designed to increase the student's knowledge and competence in basic areas necessary for Modern Electrical Engineering, while affording sufficient freedom to allow an in-depth study of such areas as Communications, Control Systems, Electronics and Digital Processing.

The Department also offers, as an integral part of the Electrical Engineering Masters Degree, the opportunity to specialize in several Concentration Areas.

Electrical Engineering Concentration Areas:

1. Bio-Medical Engineering
2. Computer Communications and Networking
3. Environmental and Energy Management
4. Microelectronics and Computer Architecture
5. Robotics and Automation
6. Security (IT Security, Biometrics, etc.)
7. Signal and Image Processing
8. Very Large Scale Integration (VLSI)
9. Wireless and Mobile Communications

Please refer to the Graduate Studies Division Catalog pages for course details of the concentration areas.

In addition, the department also offers the opportunity to acquire dual graduate degrees along with the M.S. degree in Electrical Engineering. Candidates for these dual Masters degree programs are typically required to complete a total of 48 credit hours to satisfy the requirements of two Masters degrees. This implies 18 credit hours in addition to the 30 hours required for the M.S. degree in Electrical Engineering.

Please refer to the Graduate Studies Division catalogue pages for detailed information on Dual Graduate Degree programs.

Furthermore, customized study plans to allow receiving the Electrical Engineering M.S. degree while pursuing either the Ph.D. degree in Computer Science and Engineering or the Ed.D. degree in Education are available. Doctoral students in these two pro-

grams should consult their respective doctoral advisors to work on their individualized plans. Further details on the dual M.S. in Electrical Engineering degree programs are available in the catalog section on Graduate Studies Division.

## **Admission Requirements**

Students must have a Bachelor of Science in Electrical Engineering or a related field. In both cases, the department may require make-up of background deficiencies.

## **COURSE REQUIREMENTS**

- A. A total of 30 semester hours is required in an approved program of study. Some students in this program enter with an undergraduate record lower than desired. These students are told in their admit letter that they must take 33 or 36 or 39 credits for their MS in E.E program.
- B. The Master's thesis is optional. If undertaken, it counts as 6 semester hours and must be conducted under the supervision of an EE Department faculty member. If the Master's thesis is not taken, then EE-597 must be taken for 3 credits.
- C. 400 or 500 level courses in Electrical Engineering, Computer Engineering and Computer Science are acceptable, with advisor approval, to count for the course requirements of the MS in E.E program.
- D. It is recognized that not all students will have the necessary depth of study in their preparatory program for the MSEE. Consequently, the Department may permit a maximum of two undergraduate electives to be taken for graduate credit.
- E. A total of one course in Mechanical Engineering or Technology Management is allowed to be taken toward the Master of Science in electrical Engineering.

The elective courses may be chosen from the list of Electrical Engineering concentration areas or chosen in consultation with the graduate advisor.

The course requirements of the concentration areas are described in the Graduate Studies Division section of the catalog.

The concentration areas can be applied to satisfy the requirements of dual Masters degree programs of study.

## **Learning Outcomes**

Students in the M.S. Electrical Engineering Program will be able to 1) demonstrate the ability to use techniques, skills and modern engineering tools necessary for engineering practice; 2) demonstrate the ability to plan and conduct laboratory experiments and interpret and report results; 3) demonstrate the ability to identify and apply concepts of engineering economics and project planning; 4) demonstrate knowledge of contemporary global and societal issues and their relationship; and 5) exercise strong oral and written communication skills including those needed for technical writing.

# Finance *Master of Science Degree*

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*Associate Professor:* Philip Maymin  
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Fax: (203) 576-4388  
Email: pmaymin@bridgeport.edu

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## **The UB MS in Finance Value Proposition**

The Master of Science in (MSF) is a 30-credit graduate program designed to meet the needs of a distinct type of professional in the finance industry. The MSF develops the ability of students whose career goals include specialist, technical, and management roles in financial enterprises. The program accomplishes its mission by developing student expertise in financial instruments, financial technology, financial analysis and financial management. Positive program outcomes will be achieved through the knowledge and skills the students will acquire from a comprehensive curriculum design, instruction in an effective learning environment, opportunities for inquiry, and professional development. This program largely leverages our existing offerings.

Students learn concepts in risk, finance, investments, and analytics that provide the basis for careers in finance. Students also develop the technical and quantitative skills needed to pursue a variety of careers in the finance industry. While more specific and analytical in nature, these learning outcomes are in line with our institutional mission, and our MBA program.

Students will learn how to evaluate and price a financial opportunity. They will learn how to gauge the appropriate level of risk to discount future projections. They will learn how to compare across investment opportunities at a given time and how to allocate among them in an optimal way. They will learn how to create useful tools for answering financial questions so that reports could be generated automatically and progress can be tracked. They will learn how to both assess and manage risk. Most importantly and most generally, they will learn how to solve financial problems with finely honed problem-solving skills via analytical capabilities and data-driven decision-making.

## **Program Characteristics**

Although students with work experience will find maximum benefit from the MSF, no pre-

vious work experience is required. The curriculum is designed to recognize and accommodate substantial diversity in preparation and experience as well as the different goals and career expectations of students. For this reason, some students may be required to complete preparatory coursework to successfully graduate from the 30-credit MSF program. Flexible course delivery enables students to proceed at their desired pace. Most students complete the MSF program in 18 to 24 months.

## **Learning Outcomes:**

Students will integrate the knowledge and skills they have gained throughout their graduate program to develop and evaluate financial and risk management strategies by:

### **Technical**

- Demonstrating an understanding of concepts learned throughout their graduate program
- Testing a hypothesis or market strategy through robust historical evaluation
- Using research, methods, and instruments to price assets, evaluate risk, and manage portfolios
- Explain and differentiate standard financial models and their assumptions

### **Human**

- Communicating complicated information at a professional level using appropriate acumen
- Demonstrating initiative, discipline, and follow-through on assignments
- Facilitating meaningful dialogue and reasoned disagreements related to class topics and current financial events

### **Conceptual**

- Evaluating the advantages and disadvantages associated with evolving regulatory environments
- Analyzing organizational decisions relating to risk management and financial practice
- Applying the theories and techniques learned throughout the graduate finance program

## **Learning Outcomes will be assessed using the following measures:**

- participation in classroom activities addressing current financial events,
- preparing case studies,
- creating one-off back tests of financial hypotheses,
- performing simulations,
- developing reusable financial and risk management tools,
- performing due diligence research projects,
- writing 5-to-10-page papers on critical financial topics,
- presenting findings in a five-minute professional presentation,
- and one capstone exercise reflecting their accumulated knowledge and skills.

## **Language Requirement**

Conditionally accepted international students with an undergraduate degree that was taught in a language other than English are required to successfully complete additional language-related coursework and third-party assessment testing before joining the program.

## **Academic Preparation**

Students with undergraduate preparation in a non-business field may be required to complete up to 12 credits of preparatory coursework. Students with a strong academic record (B or better in each case) from an accredited university may be able to waive preparatory foundation courses. Accounting & Business Law (ACCT500) requires both managerial and financial accounting, as well as any course labelled business law that included contracts and tort law. Economics & Finance (ECON500) requires both micro- and macro-economics, as well as finance that included time value of money. Information Systems & Quantitative Methods (ITKM500) requires information systems, intermediate Excel, and either MS Excel- or SAS-based statistics or research methods. Management & Marketing (MGMT500) requires organizational behavior, operations management, and marketing or any similarly named course that includes consumer behavior.

## Finance *Master of Science Degree*

### **Preparatory Courses: Acquiring the Foundation for Success (up to 12 Credits)**

This coursework provides the basic fundamentals across the business disciplines that serve as a necessary foundation for the MSF program.

- ACCT500 Accounting & Business Law
- ECON500 Economics & Finance
- ITKM500 Information Technology & Quantitative Methods
  
- MGMT500 Management & Marketing

### **MSF Program Curriculum: (30 credits total - all courses are three credits)**

#### **Core Courses (24 credits)**

- FIN 505: Advanced Financial Management & Policy
- FIN 520: Investment Analysis
- FIN 525: International Financial Management
- FIN 534: Behavioral Economics and Algorithmic Finance
- FIN 540: Financial Analysis & Modeling
- FIN 545: Financial Derivatives & Risk Management
- ITKM505: Information Systems & Knowledge Management
- ITKM560: Foundations in Advanced Analytics

#### **Capstone Courses (6 credits)**

- GLDP501 Research Methods
- BUCP598 Thesis or BUCP599 Internship

### **Eligibility for Transfer Credits in the 30-credit upper-level Program Courses**

For students with graduate coursework from a regionally accredited university: No more than two (graduate) courses may be transferred into the MSF program. For students who have earned graduate credit from the Trefz School that is not included in a con-

ferred degree: all applicable (graduate) three-credit courses may be transferred into the MSF program.

### **MS/MBA Dual-Degree Program**

The Trefz School offers students the opportunity to acquire concurrent (students must not be eligible to graduate from either program until the final semester) graduate degrees within the Trefz School in which students may apply up to 15 credit hours to both programs. A minimum of 51 credit hours must be completed to satisfy the requirements of this dual-degree program.

### **STEM Designation**

The MSF is classified by ICE (U.S. Immigration and Customs Enforcement) as a STEM (Science, Technology, Engineering and Math) degree.

### **Progression/Sequence of Coursework**

Preparatory coursework is the first step. In some cases, students may take a combination of Preparatory and Core courses during their transition into the Program. Students begin the formal MSF program by completing the eight Core courses (in any order). The Capstone courses should be taken in the final semester, or final two semesters.

### **Fulltime Status**

Fulltime status requires at least three classes per semester (spring and fall) for international students and at least two classes per semester for domestic students. International students on an F1 or J1 visa may take fewer than 9 credits only once during their graduate tenure (spring and fall semesters), which is only permitted in their final semester.

### **Grading Policy**

A grade of C or better is required for credit toward graduation in all preparatory and program coursework. Students are expected to maintain a semester GPA of 3.0 or better throughout their studies. Those students who earn a semester GPA below 3.0 will be placed on probation and must comply with the associated formal process to successfully maintain proper status.

### **Requirements for Graduation**

To qualify for the award of the degree of Master of Science in Finance, a student must fulfill the following minimum requirements:

1. Admitted to candidacy for the degree in the School of Business.
2. Satisfactorily complete all academic requirements with a cumulative grade point average grade of "B" (CGPA = 3.0) or better.
3. File an application for the award of the degree at the Registrar's Office on or before the date published in the University Calendar.
4. Complete all academic requirements within five (5) years from the date of first registration, unless a petition for extension is granted. Extensions are granted only for compelling reasons.

# Global Development and Peace *Master of Arts Degree*

Chair: Dr. Dave Benjamin  
 Carlson Hall 235  
 Telephone: (203) 576-4966  
 Fax: (203) 576-4967  
 Email: dbenjamin@bridgeport.edu

The Master of Arts in Global Development and Peace is designed for individuals who intend to pursue careers in international public service through intergovernmental organizations, government agencies, and non-governmental organizations. Graduates of the Master of Arts in Global Development and Peace will also be prepared for the careers in the private sector, especially to work in banks, insurance companies, corporations, and management firms that have branch offices, holdings, partnerships, and/or clients in developing countries.

All courses are 3 credits.

This graduate degree is designed to allow future civil servants and business professionals interested in global development and human security to develop an understanding of

- Extant models of socioeconomic development
- Prerequisites for good governance in developing countries
- The impact of religion and culture on intra- and interstate relations.

Students in the program will also develop competence in:

- Quantitative and qualitative research and analysis.
- Negotiation and conflict resolution.
- Project management and related problem-solving skills

They are also expected to develop or demonstrate a Foreign Service Level 2 (limited working proficiency) of at least one world language beside English.

## **Masters of Arts Core Requirements**

The program is developed as a 36 credit graduate course of study that requires four semesters of study including a overseas internship. It requires the student to have completed some foundational coursework in political economy and have a working knowledge of at least one world language. Students may apply without the prerequisites, but they will need to demonstrate competency in these areas prior to completion of their degree. Un-

dergraduate students in the College of Public and International Affairs who complete 12 semester hours of the program in addition to all the requirements for their undergraduate degree may receive a Graduate Certificate in Global Development & Peace provided they receive no grade lower than a B in the 12 graduate credits that they complete. These 12 semester hours must be in excess of the required 120 semester hours for graduation with the Bachelor's degree.

The curriculum of the Master's degree is designed so that students will develop competency in the following areas:

- Qualitative and Quantitative Research Methods and Their Applications to Development.
- International Political Economy and the Major Theories of Development.
- An Appreciation of the Role played by Religion and Culture in Development
- Conflict Analysis and Resolution
- Diplomacy and Negotiation

The Masters offers three potential tracks and students should choose from one of the following:

### **CONFLICT ANALYSIS AND RESOLUTION TRACK**

For those interested in conflict management

### **INTERNATIONAL POLITICAL ECONOMY AND DEVELOPMENT TRACK**

For those interested in development and its challenges

### **GLOBAL MANAGEMENT TRACK**

For those interested in working in the commercial domain, especially in emerging and developing economies.

### **GLOBAL MEDIA AND COMMUNICATION**

For those interested in public diplomacy or in serving as a spokesperson.

## **Course of Study**

Sample Curriculum Sequence:

#### **Semester I**

Core (9 semester hours)  
 GLDP 511 Issues in Economic Development 3

GLDP 522 International Conflict and Negotiation 3  
 GLDP 528 Sociopolitical Implications of the World's Religions  
 Or GLDP 525 Globalization

\*Note: All first semester GLDP students take these same core courses.

#### **Semester II**

Core for All Students

GLDP 501 Research Methods

#### **Specialization Track A Conflict Analysis and Resolution**

Choose Two:

GLDP 535x Peace Psychology  
 GLDP 581 Advanced Diplomacy  
 GLDP 524 Political and Economic Integration

#### **Specialization Track B International Political Economy & Development**

Choose Two:

GLDP 523 Corruption  
 GLDP 540 Culture and Development or  
 GLDP 563 International Human Rights

#### **Specialization Track C Global Media and Communication**

Choose Two:

GMCS 511 Communication Theory  
 GMCS 529 Advanced Intercultural Communication  
 GMCS 543 Communication and National Development  
 GMCS 555 News Media & International Journalism  
 GMSC 562 Media Communication Law and Legal Issues

**or**

#### **Specialization Track D Global Management**

Choose Two:

GLDP 523 Corruption  
 GSB 537/MGMT 532 Global Program and Project Management 3  
 GSB 580/MGMT 523 Leadership, Teams & Managing Change 3  
 GLDP 528 Political and Economic Integration

#### **Semester III**

For all Tracks

GLDP 591 Internship

#### **Semester IV**

#### **Specialization Track A Conflict Analysis and Resolution**

Choose 2 plus one course in another Track B, C, or D

GLDP 560 Sustainable Development  
 GMCS 543 Communication and National Development  
 GLDP 563 International Human Rights  
 GMCS 529 Advanced Intercultural Communication

#### **Specialization Track B International Political Economy and Development**

Choose 2 plus one course in Track A, C, or D

GLDP 540 Culture and Development  
 GLDP 560 Sustainable Development  
 MGMT 532 Global Program and Project  
 GSB 539 International Issues 3

#### **Specialization Track C Global Communication**

Choose two plus one course in Track A, B or D

GMCS 555 News Media & International Journalism  
 GMSC 562 Media Communication Law and Legal Issues

# Global Development and Peace *Master of Arts Degree*

GLDP 529 Advanced Intercultural Communication

## Specialization Track D Global Management

Choose two plus one course in Track B, C, or D

FIN 500	International Trade and Finance	3
FIN 630	International Financial Management	3
FIN 743	Technical Analysis & Trading	3
GLDP 561	Sustainable Development	3
MGMT 779	International Issues	3
MGMT 632	Global Program and Project Management	3

## SEMESTER V

GLDP 598	Tutorial
GLDP 599	Thesis

**Total Semester hours for Semesters I-V** **36**

## ENGLISH LANGUAGE REQUIREMENT

For applicants whose native language is not English, a minimum score of 213 (computer) or 550 (paper) on the TOEFL (Test of English as a Foreign Language) is required.

Exception to these requirements will be considered on a case-by-case basis in consultation with the Director of the University's English Language Institute and following completion of an oral and written English exam that is administered by the English Language Institute. Students with demonstrated difficulty communicating in English may be required to take an advanced ELI course even if they have earned between 213/550 and 250/600 TOEFL scores.

## MINIMUM GRADE POINT AVERAGE REQUIREMENT

Candidates for the Masters of Arts in Global Development & Peace are required to maintain a minimum semester grade point average of 3.0 to remain in good academic standing. The Master of Arts in Global Development may only be conferred upon a student who has the minimum required average of a 3.0 at the conclusion of the student's studies. To receive credit for the completion of one of the tracks, a minimum of a "B" must be received in each course within the concentration. Students failing to maintain minimum academic standards will be placed on academic probation at the end of the first semester in which they do not maintain a semester or overall GPA of at least 3.0 or earn a C- or lower grade in any class. If the student fails to raise his overall GPA above a 3.0 by the end of the semester following being placed on academic probation, fails again to earn at least a 3.0 semester GPA or

again earns a C- or lower grade in any class, she or he will be separated from the GLDP program. A student separated from the program may apply for readmission to the program following a minimum of one semester of not participating in the program. If, following this, the student does not achieve the needed 3.0, he or she is definitively separated from the program.

## Learning Outcomes

The Master of Arts in Global Development & Peace has the following learning outcomes:

1. Students will be able to explain and compare the major extant models for socioeconomic development.
2. Students will demonstrate that they have acquired the quantitative and qualitative research skills needed to undertake effective planning, analysis and implementation of projects related to socioeconomic development or conflict resolution.
3. Students will demonstrate an understanding of the institutional prerequisites for good governance in developing countries.
4. Students will demonstrate an appreciation of the impact that religion and culture can have on socioeconomic development
5. Students will demonstrate the basic skills needed for effective communication and negotiation.
6. Students will demonstrate skills needed in problem solving and in project management through an overseas internship.
7. Students will demonstrate a working knowledge of a second language in addition to English.

*\* Note for all academic programs in the College of Public and International Affairs, a portfolio is collected to track progress in programmatic outcomes.*

# Global Media and Communication Studies *Master of Arts Degree*

Chair: Dr. Yanmin Yu  
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The Master of Arts in Global Media and Communication Studies is designed to prepare students to become communication specialists who can respond to the information revolution and the globalization of media. The program conveys the importance of media experts that possess intercultural sensitivity and an ability to transcend borders and interpret the communications of other cultures. The program's Global Communications Track introduces and supports its students to develop the skills needed for careers in as spokespersons, cross-cultural communications specialists for governmental, nongovernmental public diplomacy and for work with transnational corporations. Its New Media Track prepares students as webmasters and content managers for industry and for the work in the public sector.

The Master of Arts in Global Media and Communication Studies is a two-year program. It requires the completion of 36 semester hours of class work, including an internship, tutorial and thesis (space). Students who enter the program are expected to have completed at least one year of college foreign language study or pass a language proficiency exam. Students who have not studied a foreign language must do such study in order to graduate. Domestic students must do the internship in a country where the foreign language that they have studied is spoken and it may be done over two summers if necessary. Non-US students who speak another global language besides English may do their internship either locally or overseas.

## Masters of Arts Core Requirements

The Master of Arts in Global Media and Communication Studies is a 36 semester hour graduate course of study that requires four to five semesters, including an overseas internship.

The curriculum of the Master of Arts in Global Media and Communication Studies is designed so that students develop and demonstrate competency in the following areas:

- Demonstrate an understanding of the roles and functions of traditional and new media

- Demonstrate an ability to function as an effective communicator, writer, and spokesperson
- Demonstrate an understanding of the different media systems in the world and patterns of communication
- Demonstrate abilities and skills to communicate across cultures and nations
- Demonstrate an ability to use media and communication skills to address conflicts and misunderstandings
- Demonstrate an understanding of the legal and ethical issues in media communication
- Demonstrate abilities and skills in gathering, writing, and reporting news in foreign countries
- Develop abilities to create effective media content
- Demonstrate abilities to assess, use, and interpret information
- Develop basic knowledge of at least one world language other than English.

The Master of Arts in Global Media and Communication Studies offers two potential tracks and students choose one based on interests and skills:

### GLOBAL COMMUNICATION TRACK

Students who elect this concentration will normally pursue a career in public diplomacy either (strike either) as a communications specialist either with a government, a government agency, an intergovernmental agency or a non-governmental agency or with a transnational corporation.

### NEW MEDIA TRACK

Students choosing this track will normally work as webmasters, web designers or specialists for government-related agencies or in the corporate world.

## Course of Study

Sample Curriculum Sequence:

### SEMESTER I

GMCS 501	Graduate Seminar in Research Methods	3
GMCS 511	Communication Theories	3

### Global Communication Track (Choose One of Following) 3

GMCS 535	International Advertising and Public Relations	
GMCS 543	Communication and National Development	

GMCS 555	News Media and International Journalism	
GMCS 557	Political Communication and Public Diplomacy	
GLDP 522	International Conflict and Negotiation	
MKTG 650	Global Market Management	

\*One additional course outside the Global Communication Track

### New Media Communication Track (Choose one of the Following) 3

GMCS 543	Communication and National Development	
GMCS 555	Media Business and Management	
GMCS 552	Advanced Web Publishing and Design	
GMCS 572	Advanced Multimedia	
	Collaborative Design Studio I	
	Collaborative Design Studio II	
	Design Management I	
	Design Management II	

\*One additional course outside the New Media Communication Track

### SEMESTER II

GMCS 529	Advanced Intercultural Communication	3
GMCS 537	Global Communication and Mass Media	3

### Global Communication Track (Choose One of Following) 3

GMCS 529	Advanced Intercultural Communication	
GMCS 537	Global Communication and Mass Media	

### Global Communication Track (Choose One of Following) 3

GMCS 535	International Advertising and Public Relations	
GMCS 543	Communication and National Development	
GMCS 555	News Media and International Journalism	
GMCS 557	Political Communication and Public Diplomacy	
GLDP 522	International Conflict and Negotiation	
MKTG 550	Global Market Management	

\*One additional course outside the Global Communication Track

### New Media Communication Track (Choose one of the Following) 3

GMCS 543	Communication and National Development	
GMCS 555	Media Business and Management	
GMCS 552	Advanced Web Publishing and Design	
GMCS 572	Advanced Multimedia	
	Collaborative Design Studio I	
	Collaborative Design Studio II	
	Design Management I	
	Design Management II	

\*One additional course outside the New Media Communication Track

### SEMESTER III

GMCS 591	Internship	3
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### SEMESTER IV

GMCS 590	Media Communication Law	3
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### Global Communication Track (Choose Two of Following) 6

GMCS 535	International Advertising and Public Relations	
GMCS 543	Communication and National Development	
GMCS 555	News Media and International Journalism	
GMCS 557	Political Communication and Public Diplomacy	
GLDP 522	International Conflict and Negotiation	
MKTG 550	Global Market Management	

\*One additional course outside the Global Communication Track

# Global Media and Communication Studies *Master of Arts Degree*

## New Media Communication Track (Choose Two of the Following)

GMCS 543	Communication and National Development	<b>6</b>
GMCS 555	Media Business and Management	
GMCS 552	Advanced Web Publishing and Design	
GMCS 572	Advanced Multimedia	
	Collaborative Design Studio I	
	Collaborative Design Studio II	
	Design Management I	
	Design Management II	

\*One additional course outside the New Media communication Track

## SEMESTER V

GMCS 598	Tutorial	3
GMCS 599	Internship	3

## ENGLISH LANGUAGE REQUIREMENT

For applicants whose native language is not English, a minimum score of 213 (computer) or 550 (paper) on the TOEFL (Test of English as a Foreign Language) is required. Exception to these requirements will be considered on a case-by-case basis in consultation with the Director of the University's English Language Institute and following completion of an oral and written English exam that is administered by the English Language Institute. Students with demonstrated difficulty communicating in English may be required to take an advanced ELI course even if they have earned between 213/550 and 250/600 TOEFL scores.

## MINIMUM GRADE POINT AVERAGE REQUIREMENT

Candidates for the Masters of Arts in Global Media and Communication Studies are required to maintain a minimum semester grade point average of 3.0 to remain in good academic standing. The Master's degree may only be conferred upon a student who has the minimum required average of a 3.0 at the conclusion of the student's studies. To receive credit for the completion of one of the tracks, a minimum of a "B" must be received in each course within the concentration.

Students failing to maintain minimum academic standards will be placed on academic probation at the end of the first semester in which they do not maintain a semester or overall GPA of at least 3.0 or earn a C- or lower grade in any class. If the student fails to raise his overall GPA above a 3.0 by the end of the semester following being placed on academic probation, fails again to earn at least a 3.0 semester GPA or again earns a C-or lower grade in any class, she or he will be separated from the GLDP program.

A student separated from the program may apply for readmission to the program following a minimum of one semester of not participating in the program.

## Curriculum

### CORE CURRICULUM (REQUIRED FOR BOTH PROGRAM TRACKS):

GLDP/GMCS 501	Research Methods	3
GMCS 529	Advanced Intercultural Communication	3
GMCS 511	Communication Theories	3
GMCS 537	Global Communication and Mass Media	3
GMCS 590	Media Communication Law and Legal Issues	3
GMCS 591	Internship	3
GMCS 598	Tutorial	3
GMCS 599	Thesis or Project Demonstrating Excellence (PDE)	3
		24

### REQUIRED COURSES FOR TRACK OPTIONS (TAKE GMCS 543 AND TWO ADDITIONAL COURSES)

#### Requirements for Track A: Global Communication Track:

GMCS 555	News Media and International Journalism	3
GMCS/GLDP 543	Communication and National Development	3
GMCS 557	Political Communication and Public Diplomacy	3
GMCS 535	International Advertising and Public Relations	3
GLDP 522	International Conflict and Negotiation	3
		9

#### Requirements for Track B: New Media Communication Track: (Take GMCS 546 and two additional courses)

GMCS 518	Traditional Media and New Media	3
GMCS 552	Advanced Web Publishing and Design II	3
GMCS 572	Advanced Digital Video Creation II	3
GMCS 546	Social Media, Business and Society	3
GMCS/GLDP 543	Communication and National Development	3
		9
	Free elective	3

**Total Semester Hours** \_\_\_\_\_ **36**

# Health Sciences *Doctor of Health Sciences*

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C. Dana Hall Room 142  
Email: agrazia@bridgeport.edu

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## **Program Overview**

The Doctor of Health Sciences (D.H.Sc.) is a terminal academic degree program that can be described as a combination of the Doctor of Science (D.Sc.) and the Doctor of Public Health (DPH) degrees. The goal is to provide a solid foundation in the health sciences while developing skills in research design and analysis, best-practices in clinical care and education. It is envisioned to contribute significantly to the personal and professional growth of healthcare professionals and educators. This program offers students with master's degrees the opportunity for continuing academic training and advancement in their fields. There are currently two areas of concentration: health care clinician and education. The Doctor of Health Sciences is an academic degree and not a clinical healthcare degree, but one which prepares healthcare professionals with tools of administration and scholarship. The goals are to enable health professionals to become better clinicians, teach in colleges and universities, or become health care administrators. For those interested in research, this program provides the foundation for both qualitative and quantitative research as core values in the educational process.

## **Concentration Areas**

This D.H.Sc. program is currently designed with two tracks:

- 1) Health care clinician track
- 2) Education track.

Students will have the option of taking courses from both tracks, as electives.

This program has the potential to grow and add new tracks as demands and needs arise in the future.

## **Admission Requirements**

Master's degree from a regionally accredited institution with a graduate cumulative grade point average of 3.0 or higher, or a First Professional Doctorate from a regionally accredited institution and professionally accredited program of study (Where appropriate).

Health care experience, professional cre-

dentials, licensure in a health related field or experience teaching in higher education is preferred. Applicants without health care or teaching experience will be evaluated on their potential for success such as significant leadership in education and the clinical environment.

## **Outcomes of the Program**

- Become leaders with the skills and knowledge to initiate changes in healthcare environments
- Have the ability to analyze and influence public policy related to healthcare services
- Possess the skills necessary to effectively utilize evidence to support best practice clinical decisions
- Have the knowledge to integrate evidence-informed complementary medicine modalities into care delivery
- Have the ability to use research to solve problems and make ethical decisions in healthcare settings.
- Effectively serve as consultants to patients, clients, community organizations, and professional colleagues
- Generate more professors with improved higher education pedagogy

## **INSTRUCTIONAL FORMAT**

This 61 credit degree program will be on a three term per year schedule and a cohort will be accepted for the beginning of each of the three terms: fall, spring and summer. All of the course work can be completed online, except for a one week on campus residency. Along with the online course work, students are also required to complete a dissertation. Taking two courses per term, students should be able to complete the program in about 40 months.

## **DISSERTATION**

Each student will be assigned a faculty advisor prior to beginning their dissertation project. Students will complete a three-course dissertation sequence that is designed to assist the student with the doctoral dissertation project. The aim of this sequence of courses is to ensure that each student is making progress toward the desired endpoint.

To complete the degree, students must com-

plete the required dissertation sequence including submitting the dissertation which must be accepted by a dissertation committee.

The dissertation topic can be an area of interest selected by you, with the approved of your adviser. Students will be working with their adviser and receive guidance throughout the dissertation process. The dissertation for the D.H.Sc. degree does not necessarily have to involve original research, but for example, can be a research paper, literature review, meta-analysis or a systematic review. There is no formal oral defense, however, the dissertation must be approved by the committee members.

The dissertation committee shall consist of a minimum of three qualified faculty members. At least two members of the committee shall be from the University of Bridgeport. All committee members must possess a terminal degree and should have some expertise in the area. The student will work closely with their committee chair, who will primarily be responsible for supervising the student's work and guiding the student's progress. The committee members will be responsible for periodically reviewing the student's progress and providing timely feedback. The responsibility of the entire committee is to examine the dissertation and meet to make a final determination concerning its acceptability. The decision of the dissertation committee will be pass or fail. Students will have the opportunity to present their dissertation during the one week on campus seminar.

## **COURSE REQUIREMENTS (61 Credits)**

### **Core Courses**

- HSCI 710 (3 Credits) Introduction to the U.S. Health Care System  
HSCI 715 (3 Credits) Research Methods for the Health Sciences  
HSCI 720 (3 Credits) Global Health Issues  
HSCI 725 (3 Credits) Fundamentals of Clinical Trials  
HSCI 730 (3 Credits) Healthcare Informatics  
HSCI 735 (3 Credits) Data Analysis and Interpretation

### **Clinical Concentration**

- HSCI 840 (3 Credits) Advanced Disease Processes and Treatment  
HSCI 845 (3 Credits) Lifestyle and Health Issues  
HSCI 850 (3 Credits) Health Promotion and Disease Prevention  
HSCI 855 (3 Credits) Integrative and Complementary Medicine

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## Health Sciences *Doctor of Health Sciences*

### **Education Concentration**

- HSCI 848 (3 Credits) Teaching in the Health Professions
- HSCI 849 (3 Credits) Educational Assessment
- HSCI 858 (3 Credits) Curriculum and Syllabus Development in Higher Education
- HSCI 859 (3 Credits) Pedagogy and Teaching Strategies for College Instructors

### **Elective Courses**

- HSCI 860 (3 Credits) Evidence-Based Practice
- HSCI 865 (3 Credits) Principles of Health Policy and Management
- HSCI 870 (3 Credits) Principles of Environmental Toxicology
- HSCI 875 (3 Credits) Infectious Diseases
- HSCI 888 (3 Credits) Medical Toxicology
- HSCI 889 (3 Credits) Comparative Health Systems

### **Dissertation Courses**

- HSCI 890 (3 Credits) Dissertation Seminar
- HSCI 891 (3 Credits) Dissertation I
- HSCI 892 (3 Credits) Dissertation II
- HSCI 895 (4 Credits) On Campus Seminar

### ***Completion of Doctoral Degree***

The doctoral degree must be completed within seven years of the date from which the student started coursework in the doctoral program. In exceptional cases, the department may recommend that the Dean grant an extension of this limit.

# Mechanical Engineering *Master of Science Degree*

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Engineering Technology Building  
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This degree program prepares the student for a successful career through advanced study in design, development, analysis, manufacturing, and maintenance of mechanical systems for a wide range of industries, including transportation, automation, medical, energy generation, electronics, and sports. The program combines core mechanical engineering courses with technical electives that enables the student to increase his/her knowledge and competence in essential skills for Mechanical Engineering while affording sufficient freedom to provide in-depth study in both traditional and contemporary curriculum areas and explore emerging interdisciplinary areas. The department provides the flexibility to allow the student to select his/her own specialty from the technical areas below:

1. General Mechanical Engineering
2. Biomechanical Engineering
3. Design Engineering
3. Manufacturing Engineering and Management
5. Mechanics and Materials
6. Mechatronics and Automation
7. Micro and Nano Engineering
8. Aerospace Engineering
9. Thermal Fluid System and Sustainable Energy

The student can design an individualized program of study with the help and approval of his/her faculty advisor if the academic and career goals extend beyond the available technical areas.

## **Learning Outcomes**

Students will:

1. demonstrate the ability to design or analyze a system, component or process to meet desired objectives within realistic, contemporary constraints such as health and safety, ethics, performance, sustainability and economics;
2. demonstrate the ability to use the techniques, skills, and modern engineering and scientific tools necessary for engineering practice;

3. demonstrate the ability to create, adapt, transfer and integrate existing and emerging technologies into new products, processes and services;
4. develop decision making, risk assessment and problem solving skills considering both economic and other constraints; and
5. develop both technical and management oral presentation and written communication skills.

## **Admission Requirements**

The Master of Science degree in Mechanical Engineering is intended to prepare individuals with a strong mathematical, scientific, or technical background for entry into the Mechanical Engineering field at an advanced level and for further study leading to the doctorate. Admission to the program requires a Bachelor's degree in Mechanical Engineering or other related engineering degree. Students with superior credentials in other engineering or science programs can be accepted into the program if they have taken sufficient mathematics and physics courses, including calculus, differential equations, and two semesters of course work of general physics. Additional courses may be required to make up deficiencies in core Mechanical Engineering areas. Applicants are expected to have an average of B or better in their undergraduate coursework.

In addition, the department also offers the opportunity to acquire dual graduate degrees along with the M.S. degree in Mechanical Engineering. Candidates for these dual Masters degree programs are typically required to complete a total of 48 credit hours to satisfy the requirements of two Masters degrees. This implies 18 credit hours in addition to the 30 hours required for the M.S. degree in Mechanical Engineering.

Please refer to the Graduate Studies Division catalogue pages for detailed information on Dual Graduate Degree programs. Furthermore, customized study plans to allow receiving the Mechanical Engineering M.S. degree while pursuing either the Ph.D. degree in Computer Science and Engineering or the Ed.D. degree in Education are available. Doctoral students in these two programs should consult their respective doctoral advisors to work on their individualized plans. Further details on the dual M.S. in Mechanical Engineering degree programs are available in the catalog section on the Graduate Studies Division.

## **Course Requirements**

A minimum of 31 semester hours is required for the MSME degree. The program combines core mechanical engineering courses with technical electives. The student is recommended to choose at least 3 electives for in-depth study in one technical area and use the rest electives for exploration in a broader technical area.

- 3 courses (9 credit hours) from the Mechanical Engineering core courses
  - MEEG 410 Advanced Fluid Dynamics
  - MEEG 451 Advanced Strength Analysis
  - MEEG 452 Advanced Vibrations
  - MEEG 453 Finite Element Methods
  - MEEG 454 Advanced Dynamics
  - MEEG 462 Applied Thermodynamics
  - MEEG 463 Advanced Heat Transfer
  - Math 410 Advanced Engineering Analysis
- 3 courses (9 credit hours) from one technical area
- MEEG 597 Masters project (3 credit hours) or MEEG 598 Masters thesis (6 credit hours)
- 2-3 elective courses (6-9 credit hours)
- ENGR 400 Engineering Colloquium (1 credit hour)

As a general guideline, only one course outside of Mechanical Engineering is allowed toward the MSME degree. However, another out-of-department course can be taken if it is required for the chosen technical area and has the approval of both the advisor and chairman.

The following is a brief introduction of the technical areas supported by the department.

### **General Mechanical Engineering**

The General Mechanical Engineering area prepares students for a broad range of career choices in the field of mechanical engineering and for their further Ph.D. study.

### **Aerospace Engineering**

The Aerospace Engineering area focuses on the design, manufacturing, innovation, performance and safety of aircraft and space craft.

### **Biomechanical Engineering**

The Biomechanical Engineering area studies the application of mechanical engineering principles to the conception, design, development, analysis and operation of biome-

# Mechanical Engineering *Master of Science Degree*

chanical systems. Coursework includes biomaterials, biotransport, biomechanics and biomedical instrument design.

## **Design Engineering**

The Design Engineering area focuses on product/machinery design and application in a variety of industries, such as the design and development of green (solar) energy system, biomedical instrumentation, automobile components and systems, automation, and different products.

## **Manufacturing Engineering and Management**

The Manufacturing Engineering and Management area provides advanced study in manufacturing. The program of study includes advanced materials and manufacturing processes, assembly and product engineering, automation in manufacturing, and manufacturing competitiveness. This prepares students with state-of-the-art knowledge, hands on experience and competency in world-class manufacturing environments. Course work emphasizes global corporate and business practices, and Manufacturing Shop Floor environments.

## **Mechanics and Materials**

The Mechanics and Materials area provides understanding of engineering materials and structures and their mechanical response and failure behavior with advanced theories, analysis methods, and modeling and simulation tools. It helps the student develop modeling and simulation skills needed to understand and enhance the thermo-mechanical behavior of engineering devices and systems.

## **Mechatronics and Automation**

The Mechatronics and Automation area studies the applications of mechatronics in manufacturing and other industrial automation, including sensors, microprocessors, programmable logic controllers and robotics.

## **Micro and Nano Engineering**

The Micro and Nano engineering area studies the micro- and nanotechnology in the mechanical systems, including the design, fabrication, packaging and modeling of microelectromechanical systems (MEMS), nano materials analysis and fabrication, fluidics, heat transfer and energy conversion at micro- and nanoscales.

## **Thermal Fluid Systems and Sustainable Energy**

The Thermal Fluid System and Sustainable Energy area provides advanced study in thermal fluid systems and sustainable energy. Courses include heating, ventilation and air conditioning (HVAC); aerodynamics and hydrodynamics of sports and vehicles; transport phenomena (heat and mass transfer and fluid flow) in manufacturing processes and medical devices; thermal management of electronics; thermal fluids system design; solar energy applications and fuel cells.

# Technology Management *Master of Science Degree*

*Chair:* Gad Selig  
Schools of Business and Engineering  
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The Master's Program in Technology Management (TM) is designed to prepare you for the fast-moving global economy where the ability to manage advances in management, engineering, science and technology is critical to innovation, competition and success. We develop leaders adept at managing technology-dependent organizations, emerging technology-based entrepreneurial businesses, technology change and innovation, and skills in establishing and maintaining superior competitive advantages for their organizations.

The Master's program is an innovation interdisciplinary graduate program that enables you to seamlessly and easily integrate courses and concentrations offered by various departments and schools at UB. Our graduates have obtained positions in engineering, technology, management and other professional careers in a wide spectrum of industries and organizations. As an integral part of the M.S. in TM, we give you the opportunity to specialize in a number of exciting concentrations after you complete specific core courses. Thus preparing you for select highly sought after industry certifications.

The MS in Technology Management program is accredited by the International Association for Management of Technology (IAMOT).

Our school has a strong internship program which allows students to work for outside companies while completing their degree. We also have on-campus jobs both within and outside the TM department.

## Learning Outcomes

The UB Technology Management Program is specifically designed to develop skills and competencies such as:

1. Identifying and evaluating the impact of relevant changing technology and managing those changes.
2. Designing programs to identify, develop and implement innovative technological based solutions.
3. Managing the effective planning and execution of those technology based initiatives and the integration of their results

into the mainstream of an enterprises' strategy, processes and operations.

4. The application of technology to create wealth.
5. Leadership, the creation and sustenance of high-performance global teams and enabling innovation.

The Department offers, as an integral part of the Technology Management Masters Degree, the opportunity to specialize in a number of concentrations, which are inter-disciplinary and available through various departments to provide more educational and career choices and flexibility for the students:

- Global Program and Project Management
- Manufacturing Management
- Supply, Logistics and Service Management
- Quality Management & Continuous Improvement
- Bio-Technology Management
- Information Technology & Analytics Management
- New Product Development, Management & Commercialization

## Course Requirements

A. A total of 34 semester hours is required in an approved program of study for the M.S. in Technology Management.

B. Completion of the following core courses (18 credit hours):

TCMG 400	Marketing, Entrepreneurship and Innovation Issues & Practices in Management
TCMG 495	Technical Writing in Communications and Research in Engr & Tech Mgmt
TCMG 524	Statistical Quality Control Techniques
MGMT 555 or MGMT 632 or MGMT 723	Global Program & Project Management
MGMT 523 or MGMT 723	Leadership, Teams and Managing Change
TCMG 525	Finance and Accounting for Managers

C. Completion of TCMG 595 Capstone or TCMG 597 Master's Project or TCMG 598 Master's Thesis (3 credit hours):

TCMG 595 is a Capstone/Project course designed to integrate concepts taught throughout the program and requires the development of a Business Plan as one of the course requirements.

Students may alternately complete a thesis or master's project.

D. Completion of ENGR 400 (1 credit)

E. Elective Courses (12 credit hours)

Students must take four elective courses (12 credit hours). These electives may be selected from any of the concentration areas listed above, in consultation with the program academic advisor. A list and description of the courses available in each concentration is available in the catalog section on course descriptions.

The concentration areas can be applied to satisfy the requirements of dual Masters degree programs of study.

Other Technology Management project courses:

TCMG 500	Graduate Co-Op/Internship in Technology Management (1-3 credit hours)
TCMG 597	Master's Project (3 credit hours)
TCMG 597C	Masters Project Extension (1 credit hour)
TCMG 598	Thesis in Technology Management (3-6 credit hours)
TCMG 599	Independent Study in Technology Management (3 credit hours)

As a pre-requisite for the program, all students are expected to have a demonstrated familiarity with statistical analysis. Any remedial course taken to meet this requirement will not be considered as an elective. Students are also expected to demonstrate basic computing skills.

Since July 2004, the Department of Technology Management has been offering these courses for the M.S. degree program in Technology Management through distance learning. For more information please contact the department or visit: <http://www.bridgeport.edu/ub/dlearning/>

# Computer Science and Engineering *Ph.D. Program*

*Program Director:* Prof. Khaled Elleithy  
Engineering Technology Building  
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The Ph.D. degree is a certification of critical aptitude in scholarship, imagination, knowledge in the discipline, enterprise in research, and proficiency and style in communication. A candidate obtaining a Ph.D. degree must display a thorough understanding in the major areas of computer science and engineering and must master the necessary tools and techniques so as to be able to make original contributions to the field of computer science and engineering. An equally important aspect is that of proficiency in oral and written communication skills.

The requirements of the Ph.D. program are: successful completion of preliminary examinations and courses, satisfactory performance in written comprehensive and oral examinations, admission to Ph.D. candidacy, successful completion and defense of original work documented as a dissertation, and the satisfaction of additional requirements such as teaching and seminars.

The formal degree to be offered is the Doctor of Philosophy in Computer Science and Engineering. This will be awarded to candidates who complete all the requirements of the Ph.D. degree described later in this section.

## **Admission Requirements**

Students admitted to the Ph.D. program should have a master degree in computer science or computer engineering or a closely related discipline with at least a 3.5 GPA. A score of at least 150 is required in the verbal section, and 165 is required in the quantitative section of the GRE scores. Conditional admission to the Ph.D. program is not available.

International students with a master's degree in computer science or computer engineering are also required to have a TOEFL IBT score of at least 80 or a minimum IELTS score of 6.5.

## **Learning Outcomes**

A graduate scholar from the Ph.D. program in the School of Engineering will: 1) use advanced mathematical proof methodologies in computer science and engineering; 2) demonstrate a robust and in-depth background in hardware and software issues in computer science and computer engineering; 3) pos-

sess a strong background in implementing software systems and/or hardware systems; 4) possess a strong background in designing diverse and integrated software/hardware systems solutions; and 5) critically analyze problems and thoroughly evaluate potential benefits of alternative solution in designing software and/or hardware systems.

## **Program Requirements**

### A. Academic Requirements:

1. Eight (3-credit hours) courses at the 500 or 600 level, in the discipline, excluding independent studies. In addition, two (3-credit hours) courses at the five-hundred or six-hundred level from the Technology Management Department are required to satisfy the Information Technology Globalization Track requirement. Only courses with at least B grade can be counted towards satisfying the course requirements.
2. A two-semester teaching practice requirement (3 credit hours each), for which students are to register with no fees. The students will be expected to teach lower undergraduate level classes, and/or assist professors as teaching assistants (i.e., perform a significant teaching role), thus giving Ph.D. graduates experience for an academic teaching career.
3. At least 15 semester hours of dissertation research, culminating in a dissertation proposal defense and dissertation defense.
4. Comprehensive examination: written and oral (proposal defense).
5. Publication of at least two journal papers, or one journal paper and two refereed conference papers, within the course of the Ph.D. topic research. These publications are not required to be single-authored by the student and they might be co-authored with members of the dissertation committee. The journals and conferences are expected to meet quality metrics established by the Department of Computer Science and Engineering.

### B. Time and Load Guidelines:

Both full and part-time students are encouraged to apply for the Ph.D. degree, which should be completed within a maximum of seven calendar years. A Ph.D. stu-

dent (part-time or full-time) is expected to devote the necessary time to courses and research to make satisfactory progress toward the degree. Satisfactory progress includes active participation in the research and teaching environment of the School of Engineering. The student advisor and dissertation committee should advise the student as to her/his progress in the program. Full-time students are required to register for at least 9 credit hours each semester while part-time students are required to register for at least 6 credit hours per academic year (spring and fall semesters).

### C. Course Work:

A Ph.D. candidate must complete at least 30 credit hours of course work, not including the dissertation, beyond the MSc. degree. Upper level undergraduate remedial courses cannot be used to fulfill the course work requirement.

### D. Course Grade Point Average:

A Ph.D. student is expected to maintain a G.P.A. of 3.0 or more. If the G.P.A. falls below 3.0, the student is automatically placed on probation. Continued probationary status for two semesters may lead to dismissal of the candidate from the program. No grade less than B is acceptable towards the course work requirement.

### E. Seminar Requirement:

A Ph.D. student is expected to present her/his research findings in public seminars. S/he is also expected to interact and participate in professional discussions and meetings such as conferences and workshops. To fulfill these requirements, a Ph.D. student is expected to present one seminar before the dissertation defense. The seminar of his/her research topic for the dissertation serves as the oral (proposal defense) part of the comprehensive exam. The Ph.D. Director awards a Pass/Fail grade after consultation with the Ph.D. director student's dissertation advisor. The student is required to register for one seminar course.

### F. Core Courses:

Ph.D. candidates are required to finish a set of 4 courses out of a list of 7 core courses. The Department of Computer Science and Engineering publishes a list of core courses every two years. The list is available through the Ph.D. Program Director. For the academic year, 2017 – 2018,

# Computer Science and Engineering *Ph.D. Program*

the list of core courses include CPSC 606 Quantum Computing, CPEG 585 Computer Vision, CPEG 560 Advanced Robotics, CPSC 590 Parallel Processing, CPEG 562 Cryptography and Cryptanalysis, CPEG 547 Field Programmable Gate Arrays and CPSC 552 Data Mining.

## G. Comprehensive Examination:

One of the major checkpoints in the Ph.D. program that assesses the breadth and depth of the student is the written and oral (proposal defense) comprehensive examination. Passing the Written Comprehensive Examination is granted when the student achieves at least a 3.5 GPA in the 4 core courses with at least B grade in each course.

The seminar requirement represents the oral (proposal defense) section of the exam. The outcome of this examination will be of fail or pass. A student can re-take this examination no more than once. A student who does not pass the comprehensive examination in two attempts will be dismissed from the program.

## H. Dissertation Committee:

After selecting a dissertation advisor, the student is required to define a problem of merit, carry out a literature search and prepare a course of action to solve the selected problem. The candidate is expected to produce a dissertation proposal. The dissertation advisor in consultation with the Ph.D. program Director, recommends a dissertation committee for the student. The dissertation committee includes at least three members in addition to the dissertation advisor. At least four members of the dissertation committee must be from a professorial rank within the school. Additionally, an external examiner is appointed as well. It is expected that the dissertation Supervisor and at least 50% of the committee membership has to be from professorial ranks of the Computer Science and Engineering Department. The external examiner is one whom has been distinguished in the field of computer science and engineering. S/he might not hold a professorial rank. Ph.D. Program Director and the Dean of the School of Engineering must then approve the dissertation committee.

## I. Admission to Candidacy:

When a student passes the written comprehensive examination, s/he will be ad-

mitted to Ph.D. candidacy. This serves as another significant milestone in progress towards the Ph.D. degree.

## I. Residency Requirement:

The Ph.D. program is an on-campus program that has a two years residency requirement. Residency can be demonstrated by taking on-campus classes, satisfying the teaching requirement, and attending seminars and meetings in the School of Engineering.

## J. 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.

## K. Dissertation Defense Examination:

After having secured approval from the dissertation committee members regarding the worthiness of the dissertation, a student will proceed with a request for the dissertation defense examination. The chairman of the dissertation committee will chair the examination. The student will schedule a convenient time for a public defense. It is the responsibility of the student to find a time that is suitable to all the members of the dissertation committee, at least two weeks before the defense. At the end of the defense, the decision of the dissertation committee will be pass or fail. It is the responsibility of the dissertation advisor to see that the comments and the criticism of the audience are addressed adequately in the final version of the dissertation. Based on the recommendation of the dissertation committee, the Ph.D.

Director, and the Departmental Chairman, the Dean of the School of Engineering will recommend the Ph.D. degree subject to the satisfaction of all other formal requirements.

## CONCENTRATION AREAS

The following is a list of Research / Concentration Areas under the Ph.D. Program.

1. Computer architecture and VLSI and FPGA
2. Design, modeling, and simulation of embedded and integrated systems and device applications
3. Electromechanical systems prototyping and optimization
4. Robotics, automation, machine perception and sensing
5. Software engineering, Web development, and computational sciences
6. Systems and computer security and biometrics
7. Mobile communications, cloud computing, Internet of Things and networking.

## SUMMARY OF MILESTONES

A summary of steps, not necessarily ordered, through which a student will proceed is as follows:

1. Admission to the Ph.D. program in computer science and engineering.
2. Completing prerequisites.
4. Completing the course work requirement for the Ph.D.
5. Passing the requirements written comprehensive examination.
6. Admission to 'Candidacy.'
7. Selection of a dissertation advisor.
8. Writing a dissertation proposal.
9. Completion of the seminar requirement and working on the proposed research topic.
10. Formation of the dissertation committee.
11. Approval of the dissertation by the dissertation committee.
12. Successful completion of the dissertation defense.
13. Submission of the dissertation to the School of Engineering.
14. Graduation with a Ph.D. degree in Computer Science and Engineering.

# Technology Management *Ph.D. Program*

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## **Program Overview**

The Ph.D. in Technology Management (TM) is designed to meet an emerging industry and academic need by offering a quality doctoral program to both part-time and full-time students in two inter-related areas: 1) new technology venture creation (e.g. entrepreneurship and corporate venturing), and 2) select current and emerging technologies. The program will encompass an integrated multi-disciplinary technology and management approach.

The Ph.D.-TM program is specifically designed to develop interdisciplinary skills and competencies in research and management of technology-dependent enterprises, technology-based entrepreneurship and new product, service and venture creation. While the Ph.D.-TM is housed in the School of Engineering, the Ph.D. degree facilitates and encourages interdisciplinary studies across the School of Engineering and the School of Business and utilizes their complementary research facilities, faculty and lab resources.

The Ph.D. degree is a certification of critical aptitude in scholarship, creativity, knowledge in the discipline, enterprise in research, and proficiency and style in communication. A candidate obtaining a Ph.D. degree must display a thorough understanding in the major areas of Technology Management and must master the necessary tools and techniques so as to be able to make original contributions to the field of Technology Management. An equally important aspect is that of proficiency in oral and written communication skills.

The requirements of the Ph.D. program are: successful completion of preliminary examinations and courses, satisfactory performance in the written comprehensive and oral (proposal defense) examinations, admission to Ph.D. candidacy, successful completion and defense of original work documented as a dissertation, and the satisfaction of additional requirements such as teaching courses, seminars and publications.

The formal degree to be offered is the Doctor of Philosophy in Technology Management. This will be awarded to candidates who com-

plete all the requirements of the Ph.D. degree described later in this section.

## **Ph.D. in Technology Management Program-Level Learning Objectives**

The Ph.D. in Technology Management Program goals are in line with the mission statement of the School of Engineering of the University of Bridgeport. In this regard, the Ph.D. program is designed to provide comprehensive education and research opportunities to a diverse student population consisting of highly qualified and competent students, scholars, industry professionals and researchers in engineering, sciences, and the application and management of technology. The program aims at preparing these highly credentialed individuals for leadership and technology positions in industry, government, and academia with significant contribution to the profession and community locally, nationally, and globally. The program offers an application oriented interdisciplinary curricula to provide a distinctive education in fundamental and emerging disciplines through its faculty and institutional partners while ensuring that the graduates possess creative, innovative, and analytical skills with a strong commitment to research and technical excellence, ethical conduct, and cultural, societal, and global well-being.

### **PROGRAM GOALS:**

- To prepare highly qualified and competent Ph.D. level scholars, industry professionals and researchers in the advance and interdisciplinary field of Technology Management.
- To prepare Ph.D. level scholars, industry professionals and researchers who are able to conduct research and develop strategies and plans to identify, develop and implement innovative technological based solutions while championing and sustaining innovation initiatives and environments.
- To prepare Ph.D. level scholars, industry professionals and researchers who are able to manage the effective planning and execution of those technology based initiatives and the integration of their impact into the mainstream of an enterprises' strategy, processes and operations.
- To prepare Ph.D. level scholars, industry professionals and researchers who are

able to manage the application of technology to create wealth and economic development as in successful entrepreneurship and/or intrapreneurship or corporate venturing initiatives.

- To develop future leader and managers in technology or technology dependent organizations that are able to lead and motivate high-performance and diversified global teams.

### **OUTCOMES ASSESSMENT:**

There are two types of outcomes that need to be monitored: Institutional Outcomes and Student Outcomes.

### **STUDENT OUTCOMES:**

1. Familiarity with principles of new venture creation, entrepreneurship, corporate venturing, innovation, and related issues including management, finance, legal issues, new product development, and product commercialization.
2. Familiarity with advanced concepts of methodologies in technology management.
3. Possessing a strong background in one or more engineering and technology area offered in the Ph.D. program.
4. Possessing a strong background in implementing new technology based businesses and ventures.
5. Being able to critically analyze problems and evaluate the benefits of alternative solutions in new technology-based international opportunities and corporate ventures.
6. Being able to work in a development team to address specific issues and problems.
7. Being able to interact and communicate both verbally and in writing with people whose expertise is in different domains and who are located across the globe.
8. Being able to effectively teach in a higher education institution.
9. Being able to write quality research papers for inclusion in prominent journals, and research proposals for submission to funding agencies.
10. Being prepared to become a future leader, professional, academic and researcher with interdisciplinary skills, to join the faculty of leading academic institutions or take high level research, consulting and management positions in industry,

# Technology Management *Ph.D. Program*

non-profit organizations, government or start their own ventures.

## Admission Requirements

The Ph.D. in Technology Management program is an advanced level program. Students are expected to demonstrate an understanding of fundamental concepts in management and technology gained through appropriate undergraduate and graduate (master) education. Students who are accepted into the Ph.D. program but lack some of those fundamental concepts will be required to remedy their deficiencies through completing satisfactory undergraduate or graduate courses (without graduate credit).

Students admitted to the Ph.D. program should have a business or management degree as well as an engineering, computer science or technology degree. To be more specific, a student should have either an (1) undergraduate Engineering or Technology (STEM\* category) and an MBA or MS in Technology Management or Engineering Management or Management of Technology or equivalent degree; or (2) an undergraduate Business or Management or TM or MOT or equivalent and a Master's degree in Engineering, Technology or STEM category, with at least a 3.3 GPA. Three+ years of industry experience or equivalent is desired. Students admitted from non-English speaking countries, having a Masters degree in engineering and an undergraduate in business or vice-versa will also be required to have a TOEFL score of at least 550 or equivalent (IBT = 80, IELTS = 6.5). The GRE exam is required for admission. Students with an undergraduate and graduate degree in engineering or a STEM category, with three or more years of business experience, may also be accepted into the Ph.D. program. The applicant must submit two letters of reference and a personal statement (containing such information as background; experience, motivation for pursuing the Ph.D. in TM areas and suggested topics for potential dissertation research, etc.)

Interested students in the Ph.D. program without a master's degree must apply and may be admitted into a master's program first, and then upon satisfactorily completing the master's degree, they would be eligible to apply for the Ph.D. program. This route assumes an appropriate Bachelor's degree (see above).

\*STEM = Science, Technology, Engineering or Math; MOT= Management of Technology.

Please refer to both the General Admissions

Information and the Ph.D. TM for detailed requirements. (<http://www.bridgeport.edu/admissions> and <http://www.bridgeport.edu/Phd-TM>)

## Academic Requirements

The requirements for Ph.D. in TM students include the following:

The Ph.D. in TM is an interdisciplinary degree for which all Ph.D. students must take a common core of five (5) required courses and choose from elective courses from Area 1 (New Technology Venture Creation) and Area 2 (Current and Emerging Technologies – Technology Specializations). Each student can choose elective courses from three study options (see below and Appendix 1). A list and short description of core and elective courses by specialization is provided in Appendix 2.

- Focus on Area 1 – New Technology Venture Creation (e.g. Entrepreneurship and Corporate Venturing): Number of courses to be taken in Area 1 is three courses each from Area 1 and two courses each from Area 2 (in one of the Technology Specializations).
- Focus on Area 2 – Current and Emerging Technologies – (Technology Specializations) Number of courses to be taken in Area 2 is four from Area 2 from one of the following Technology Specialization areas and one from Area 1. The Technology Specialization areas focus on one of the following:
  - Bio-Tech and Bio-Medical Technology, Systems and Processes
  - Information Analytics, Technology and Decision Support Systems
  - Manufacturing, Supply Chain and Logistics Technology, Systems and Processes
- Combination of Areas 1 and 2 – Number of courses to be taken is two each from Area 1 and three each from Area 2. In Area 2, the students must pick courses from one Technology Specialization area for depth coverage.

## TIME AND LOAD GUIDELINES

The program will admit both full and part-time students. For all students, the program must be completed within a maximum of seven calendar years. If a student requires more than seven years, he/she must file a letter of appeal requesting a time extension

to the Dean of the SOE and the Ph.D. program coordinator. A Ph.D. student (part-time or full-time) is expected to devote the necessary time to courses and research in order to make satisfactory progress toward the degree. Satisfactory progress includes active personal participation in the research and teaching environment of the School of Engineering. The student advisor and dissertation committee should advise the student as to his/her progress in the program. Full time students are required to register for at least nine credit hours each semester while part-time students are required to register for at least six credit hours per academic year (spring and fall semesters).

## TIME LIMITS

All requirements for the doctoral degree must be completed within the seven-year period (accumulating to 21 Fall, Spring, and Summer semesters) following admission to the doctoral program.

## TIME LIMIT EXTENSION REQUEST

Under compelling circumstances beyond the student's control, a student may petition for a one-semester extension of the seven-year time limit. If the one-semester extension is recommended by the Ph.D. in Technology Management Program Director and approved by the Dean, the student has one additional semester to complete work on the dissertation. If the student fails to complete all degree requirements within the time for the student's doctoral program or within a one-semester extension approved as noted above, the student will be dismissed from the doctoral program. To complete the doctoral degree, the student must reapply for admission. Policies do not provide the option to revalidate courses completed more than six years prior to the date of admission. A readmitted student therefore would be able to apply to the new admission only those courses approved by the department and Graduate School and complete within the prior six years (accumulating to 18 Fall, Spring, and Summer semesters).

## COURSE WORK

A Ph.D. candidate must complete at least 30 credit hours of course work, not including the dissertation, beyond the Masters degree. Upper level undergraduate remedial courses cannot be used to fulfill the coursework requirement. The Ph.D. dissertation will require a minimum of 15 credit hours to complete.

Courses must be selected as follows:

# Technology Management *Ph.D. Program*

1. Five Core Courses of three credit hours each.
2. Additional five (three credit hours each) courses in specific areas\*\*
3. A one-semester teaching practicum requirement (no credit hours).

## **COURSE GRADE POINT AVERAGE**

A Ph.D. student is expected to maintain a G.P.A. of 3.0. If the cumulative G.P.A. falls below 3.0, the student is automatically placed on probation. (Note: grades for transferred courses are not included in the calculation of the University of Bridgeport GPA). Continued probationary status for two semesters will lead to dismissal of the student from the program.

\*Students admitted to the Ph.D. program should have a business or management degree as well as an engineering, computer science or technology degree. To be more specific, a student should have either: (1) An undergraduate Engineering or Technology (STEM = Science, Technology, Engineering and Mathematics category) degree and an MBA or MS in Technology Management or Engineering Management or Management of Technology (MOT) or equivalent graduate degree; or (2) an undergraduate Business or Management or TM or MOT or equivalent degree and a Master's degree in Engineering, Technology or STEM.

\*\* Area 1 – New Technology Venture Creation and Area 2 – Select Current & Emerging Technologies (see Ph.D. Program Structure for additional requirements and areas) No grade less than C is acceptable towards course work requirements.

## **PH.D. PROGRAM DIRECTOR**

The Dean of the School of Engineering will appoint a director for the doctoral program. The director supervises the implementation of the Ph.D. program. S/he is responsible for coordinating administrative functions related to the Ph.D. program including admission, marketing, appointment of advisors, and formation of dissertation committees, for each doctoral student. In addition, the director is charged with preparing and administering the preliminary and the comprehensive examinations. The director is also responsible for recommending courses for students who may not have the proper prerequisites for certain courses.

## **ADVISOR**

Each Ph.D. candidate, in her/his first semester, will be assigned a program advisor by the

Ph.D. program director. The advisor will develop a program of study for the student and monitor his/her progress until a dissertation committee is formed for the student. A dissertation advisor will be appointed for each student after he/she passes the comprehensive exams and perform all subsequent advising. The program advisor and dissertation advisor may be the same person or two different people. A student is required to form a dissertation committee in conjunction with the Ph.D. program director after finishing the core Ph.D. courses (and passing the candidacy examinations), so that a better understanding of the various topics and research interests in the department will, by then, have been achieved.

## **COMPREHENSIVE EXAMINATION**

One of the major checkpoints in the Ph.D. program that assesses the breadth and depth of the student's academic accomplishment and progress is the candidacy examinations and oral dissertation proposal defense examination. The candidacy examinations will test the breadth and depth of knowledge in all aspects of Technology Management related to the body of knowledge required for the Ph.D. in Technology Management, including but not limited to, the core curriculum courses, and the courses in Areas 1 and 2. The candidacy examinations should be taken at the completion of all course work.

The Ph.D. Program Director will organize these candidacy examinations, which will be developed and graded by faculty. The outcome of this examination will be a fail or pass. A student can sit for this examination twice. A student who does not pass the candidacy examinations in two attempts will be dismissed from the program. A student may submit an appeal regarding the potential dismissal from the program.

## **DISSERTATION COMMITTEE AND ORAL DEFENSE OF PROPOSED DISSERTATION TOPIC IN A PUBLIC SEMINAR**

After passing the required examinations and selecting a dissertation advisor (or having an advisor appointed), a student is required to define a problem of merit, carry out a literature search and prepare a course of action to solve the selected problem. The candidate is expected to produce a dissertation proposal, which must be orally defended in a public seminar. The Ph.D. director awards a Pass/Fail

grade after consultation with the student's dissertation advisor and committee.

The Ph.D. Program Director, in consultation with the dissertation advisor, recommends a dissertation committee for the student. The dissertation committee contains at least three members in addition to the dissertation advisor. At least four members of the dissertation committee must be from a professorial rank within the School of Engineering and/or other schools. Additionally, an external examiner is appointed as well. The external examiner is one who is distinguished in the field of Technology Management. The Ph.D. Program Director and the Dean of the School of Engineering must approve the dissertation committee.

## **ADMISSION TO CANDIDACY**

Every student enrolled in the Ph.D. in Technology Management degree program must take a candidacy examination administered by the program director and the graduate faculty. The candidacy exam aims at assessing the capability of the student conducting doctoral research based on evidence of critical thinking, problem solving, conducting original research and other measures viewed as essential functions of a successful doctoral student. When a student passes the candidacy examination and fulfills all other requirements, s/he will be admitted to Ph.D. candidacy.

## **PH.D. DISSERTATION**

The student is expected to work on the accepted topic and original results. S/he must 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 international professional literature, i.e. refereed conference proceedings and 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.

## **DISSERTATION DEFENSE EXAMINATION**

After securing approval from the dissertation

# Technology Management *Ph.D. Program*

committee members regarding the worthiness of the dissertation, a student will proceed with a request for the dissertation defense examination. The chair of the dissertation committee will chair the examination. The student will schedule a convenient time for a public defense. It is the responsibility of the student to find a time that is suitable to all the members of the dissertation committee, at least two weeks prior to the defense. At the end of the defense, the decision of the dissertation committee will be pass or fail. It is the responsibility of the dissertation advisor to see that the comments and the criticism of the audience are addressed adequately in the final version of the dissertation. Based on the recommendation of the dissertation committee, the Ph.D. in Technology Management Director and the Dean of the School of Engineering will recommend the Ph.D. degree, subject to the satisfaction of all other formal requirements.

## SUMMARY OF MILESTONES \_\_\_\_\_

A summary of steps, not necessarily ordered, through which a student will proceed, is as follows:

- Admission to the Ph.D. program of Technology Management;
- Completing prerequisites, if needed;
- Completing the course work requirement for the Ph.D.;
- Passing the written comprehensive examination;
- Admission to 'Candidacy';
- Selection of a dissertation advisor;
- Writing a dissertation proposal and its oral defense;
- Formation of the dissertation committee;
- Approval of the dissertation by the dissertation committee;
- Successful completion of the dissertation defense;
- Submission of completed and approved dissertation to the School of Engineering;
- Graduation with a Ph.D. degree in Technology Management.

## Course Requirements

### CORE COURSES \_\_\_\_\_

- Exploration in Research Methodologies (TMPD 702)
- Research Design, Analysis and Measurement (TMPD 704)
- Quantitative Methodologies (TMPD 706)

- Technology New Venture Creation (TCMG 645)
- Strategic Management of Technology & Innovation (TCMG 620)
- Comprehensive Written Exams – Both Areas 1 & 2 (TMPD 694)
- Oral Defense of Dissertation Proposal (TMPD 699)
- One semester teaching practice requirement (TMPD 698)
- Completion of one published refereed Journal Paper or 2 refereed Conference Papers (No Credit)
- Ph.D. Dissertation (TMPD 710) (Minimum of 15 Credits)

### NEW TECHNOLOGY VENTURE CREATION \_\_\_\_\_

Select Elective Course Example

- Leadership, Teams & Managing Change
- New Product Development & Commercialization
- Small Business and Entrepreneurship
- Intellectual Property Management
- Project Management

### SELECT CURRENT & EMERGING TECHNOLOGIES (TECHNOLOGY SPECIALIZATION) \_\_\_\_\_

- Biotech & Biomedical Technology, Systems & Processes\*\*
- Environmental and Energy Technology, Systems and Processes
- Engineering Economics and Financial Engineering
- Information Analytics, Technology & Decision Support Systems \*\*
- Manufacturing, Supply Chain and Logistics Technology, Systems and Processes\*\*  
(\**Initial Technology Specializations to be offered at program start*)

## Summary & Short Course Descriptions

### CORE COURSES FOR PH.D. TM STUDENTS

Number	Name	Credit Hours
TMPD 702	Exploration in Research Methodologies	3
TMPD 704	Research, Design, Data Analysis and Measurement	3
TMPD 706	Quantitative Methodologies	3
TCMG 620x	Strategic Management of Technology and Innovation (Proposed new course)	3
TCMG 645	Technology New Venture Creation	3
TMPD 694	Written Comprehensive Examinations	0
TMPD 698	Teaching Practicum	0

TMPD 699	Seminar (Oral Defense of Dissertation Proposal)	0
TMPD 710	Ph.D. Dissertation	Min. 15

### Elective Courses that can be taken by Ph.D. or MS Students:

#### AREA 1 : NEW TECHNOLOGY VENTURE CREATION

Number	Name	Credit Hours
TCMG 505 or MGMT 555	Global Program and Project Management	3
TCMG 506	Advanced Program and Project Management	3
TCMG 508 or MGMT 565	Foundations of Product Management	3
TCMG 512 or MGMT 590	Intellectual Property Management	3
TCMG 523 / MGMT 523	Leadership, Teams & Managing Change	3
TCMG 525	Finance and Accounting for Managers	3
TCMG 580x / MGMT 585x	New Product Commercialization	3
TCMG 595	Global Business/ Technology Capstone	3
TCMG 532 / MKTG 560	Global Market Management	3
TCMG or MGMT 582	Small Business and Entrepreneurship	3
TCMG 559 or MGMT 560	Foundation of Business Process and Operations Management	3

*Other courses to be approved by Advisor & Program Director*

#### AREA 2 : BIO-TECHNOLOGY AND BIO-MEDICAL TECHNOLOGY, SYSTEMS AND PROCESSES

Number	Name	Credit Hours
BMEG/MEEG 508	Biomechanics	3
BMEG/ELEG 510	Medical Machines	3
BMEG/ELEG 513	Biomedical Image Processing	3
BMEG/TCMG 535	Foundations of Bio Tech Sciences and Management	3
BMEG/ELEG 547	Bio MEMS	3
BMEG/TCMG 555X	Biotechnology and Entrepreneurship	3
BMEG/ELEG 562	Nanofabrication with Soft Materials	3
BMEG/MEEG 563	Polymer Nanocomposites	3
BMEG 565	Biomedical Materials and Engineering	3
BMEG/MEEG 567X	Physiological Fluid Dynamics	3
BMEG 580	Tissue Engineering	3
CPSC 551	Advanced Database Design	3

*Other courses to be approved by Advisor & Program Director*

#### AREA 2 : INFORMATION ANALYTICS, TECHNOLOGY AND DECISION SUPPORT SYSTEMS

Number	Name	Credit Hours
CPSC 546	Services Oriented Architecture	3
CPSC 551	Advanced Database Design	3
CPSC 556	Data Mining	3

# Technology Management *Ph.D. Program*

CPSC 555	Web-based Application Development	3
CPSC 562	Information Assurance (Security)	3
CPSC/CPEG 571	Internet Computing	3
TCMG 520	Information Systems Development and Design	3
TCMG 533	Information Technology Strategy and Governance	3
TCMG/MEEG 540	Simulation and Modeling	3
TCMG 521 or ITKM 505	Information Systems and Knowledge Management	3
TCMG/CPSC 568X	Foundation of Information Analytics	3
TCMG 571 or MGMT 571	Foundations of Service Management and Engineering	3
TCMG 549 or MGMT 548	Business Intelligence and Decision Support Systems	3

*Other courses to be approved by Advisor & Program Director*

## **AREA 2 : MANUFACTURING, SUPPLY CHAIN AND LOGISTICS TECHNOLOGY, SYSTEMS AND PROCESSES**

Number	Name	Credit Hours
TCMG 524	Statistical Quality Control Techniques	3
TCMG/MEEG 530	Foundations of Manufacturing Management	3
TCMG 534 or MGMT 534	Strategic Sourcing and Vendor Management	3
MEEG 512x	Computational Fluid Dynamics	3
MEEG/ BMEG 567X	Physiological Fluid Dynamics	3
TCMG/ MEEG 572	Production Technology and Techniques	3
MEEG/TCMG 573 or MKTG 565	Supply Chain Management	3
MEEG/ TCMG 574	Principles of Logistics	3
MEEG 575	Manufacturing Strategy	3
MEEG/TCMG 577X	Lean Manufacturing	3
TCMG 578X	Six Sigma	3
TCMG 559 or MGMT 560	Foundation of Business Process and Operations Management	3

*Other courses to be approved by Advisor & Program Director*

