M.S. in Applied Science

This is a multidisciplinary program for secondary school teachers to strengthen their background in science, business, computing, engineering, architecture and/or technical communication.

Admission Requirements

Applicants should be practicing secondary school teachers who have a bachelor’s degree. Individuals who seek admission to the program are considered on an individual basis and will be advised in choosing a track matching their teaching assignments as teachers. Students who lack an appropriate background for their chosen track or a particular course that they plan to take may be asked to take one or more bridge/undergraduate courses that will not count toward the degree requirements.

Degree requirements

Students must successfully complete 30 credits:

- 9 credits of core courses;
- 3 credits of master’s project or 6 credits of master’s thesis;
- 15 credits of courses in the chosen track when choosing the project option or
- 12 credits of courses in the chosen track when choosing the thesis option; and
- at least 3 credits of additional elective courses (elective courses can be from other tracks if the student has the required background or prerequisites).

Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTC 603</td>
<td>Identity, Technology, and Communication</td>
<td>3</td>
</tr>
<tr>
<td>PTC 629</td>
<td>Theory and Practice of Social Media</td>
<td>3</td>
</tr>
<tr>
<td>PTC 681</td>
<td>Tech in Class &amp; Learning Envir</td>
<td>3</td>
</tr>
<tr>
<td>PTC 698</td>
<td>Selected Topics in Professional and Technical Communication</td>
<td>3</td>
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</tbody>
</table>

Tracks

Business

Required Courses (3 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MGMT 620</td>
<td>Management of Technology</td>
<td></td>
</tr>
</tbody>
</table>

Additional Courses (choose 3 or 4 courses to earn 9 or 12 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 610</td>
<td>Managerial Economics</td>
<td></td>
</tr>
<tr>
<td>FIN 600</td>
<td>Corporate Finance I</td>
<td></td>
</tr>
<tr>
<td>FIN 624</td>
<td>Corporate Finance II</td>
<td></td>
</tr>
<tr>
<td>MGMT 635</td>
<td>Data Mining and Analysis</td>
<td></td>
</tr>
<tr>
<td>MGMT 640</td>
<td>New Venture Management</td>
<td></td>
</tr>
<tr>
<td>MGMT 650</td>
<td>Knowledge Management</td>
<td></td>
</tr>
<tr>
<td>MGMT 691</td>
<td>Legal and Ethical Issues</td>
<td></td>
</tr>
<tr>
<td>MGMT 692</td>
<td>Strategic Management</td>
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</tr>
</tbody>
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Computer Science

Required Courses (6 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 505</td>
<td>Programming, Data Structures, and Algorithms</td>
<td></td>
</tr>
<tr>
<td>CS 506</td>
<td>Foundations of Computer Science</td>
<td></td>
</tr>
</tbody>
</table>

Additional Courses (choose 2 or 3 courses to earn 6 or 9 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 610</td>
<td>Data Structures and Algorithms</td>
<td></td>
</tr>
<tr>
<td>CS 630</td>
<td>Operating System Design</td>
<td></td>
</tr>
<tr>
<td>CS 631</td>
<td>Data Management System Design</td>
<td></td>
</tr>
<tr>
<td>CS 656</td>
<td>Internet and Higher-Layer Protocols</td>
<td></td>
</tr>
</tbody>
</table>
### Engineering Management

**Required Courses (6 credits)**
- EM 636: Project Management
- HRM 601: Organizational Behavior

**Additional Courses (choose 2 or 3 courses to earn 6 or 9 credits)**
- ACCT 615: Management Accounting
- IE 673: Total Quality Management
- MIS 645: Information Systems Principles
- EM 634: Legal, Ethical and Intellectual Property Issues for Engineering Managers
- EM 637: Project Control
- EM 691: Cost Estimating for Capital Projects
- EM 632: Legal Aspects in Construction

### Information Systems

**Required Courses (6 credits)**
- IS 601: Web Systems Development
- IS 663: System Analysis and Design

**Additional Courses (choose 2 or 3 courses to earn 6 or 9 credits)**
- IS 631: Enterprise Database Management
- IS 665: Data Analytics for Info System
- IS 676: Requirement Engineering
- IS 678: IT Service Management
- IS 680: Information Systems Auditing
- IS 681: Computer Security Auditing
- IS 684: Business Process Innovation
- IS 688: Web Mining

### Engineering

**Required Courses (6 credits)**
- IE 604: Advanced Engineering Statistics
- IE 621: Systems Analysis and Simulation

**Additional Courses (choose 2 or 3 courses to earn 6 or 9 credits)**
- ECE 601: Linear Systems
- ECE 605: Discrete Event Dynamic Systems
- ECE 673: Random Signal Analysis I
- IE 618: Engineering Cost and Production Economics
- IE 672: Industrial Quality Control
- IE 673: Total Quality Management
- ME 616: Matrix Methods in Mechanical Engineering
- ME 632: Mechanical Engineering Measurements
- ME 635: Computer-Aided Design
- BME 669: Engineering Physiology
- BME 670: Introduction to Biomechanical Engineering
- BME 675: Computer Methods in Biomedical Engineering

### Architecture

**Required Courses (6 credits)**
- ARCH 545G: Structures I
- ARCH 548G: Structures II

**Additional Courses (choose 2 or 3 courses to earn 6 or 9 credits)**
- ARCH 555G: Tools and Techniques I
- ARCH 500G: Tools and Techniques II
- ARCH 528G: History of Architecture I
- ARCH 529G: History of Architecture II
- ARCH 541G: Construction I
### ARCH 542G
- Construction II

### ARCH 543G
- Environmental Control Systems I

### ARCH 544G
- Environmental Control Systems II

### ARCH 569G
- Professional Practice I

### Chemistry

**Required Courses (6 credits)**
- CHEM 605: Advanced Organic Chemistry I: Structure
- CHEM 661: Instrumental Analysis Laboratory

**Additional Courses (choose 2 or 3 courses to earn 6 or 9 credits)**
- CHEM 673: Biochemistry
- CHEM 777: Principles Pharm Chemistry
- EVSC 616: Toxicology
- EVSC 610: Environmental Chemical Science

### Mathematics

**Required Courses (6 credits)**
- MATH 545: Introductory Mathematical Analysis
- MATH 546: Advanced Calculus

**Additional Courses (choose 2 or 3 courses to earn 6 or 9 credits)**
- MATH 611: Numerical Methods for Computation
- MATH 630: Linear Algebra and Applications
- MATH 660: Introduction to statistical Computing with SAS and R
- MATH 661: Applied Statistics

### Physics

**Required Courses (3 credits)**
- PHYS 611: Adv Classical Mechanics

**Additional Courses (choose 3 or 4 courses to earn 9 or 12 credits)**
- PHYS 621: Classical Electrodynamic
- PHYS 641: Statistical Mechanics
- PHYS 661: Solid-State Physics
- PHYS 607: Topics in Astronomy and Cosmology

### Custom track

Students may develop an individual track in consultation with a graduate advisor. A coherent set of courses involving mathematics, computing, physics, chemistry, biology or engineering are expected.