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>
</tr>
</tbody>
</table>

Tracks

Business

Required Courses (3 credits)

- MGMT 620 Management of Technology

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

- ECON 610 Managerial Economics
- FIN 600 Corporate Finance I
- FIN 624 Corporate Finance II
- MGMT 635 Data Mining and Analysis
- MGMT 640 New Venture Management
- MGMT 650 Knowledge Management
- MGMT 691 Legal and Ethical Issues
- MGMT 692 Strategic Management

Computer Science

Required Courses (6 credits)

- CS 505 Programming, Data Structures, and Algorithms
- CS 506 Foundations of Computer Science

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

- CS 610 Data Structures and Algorithms
- CS 630 Operating System Design
- CS 631 Data Management System Design
- CS 656 Internet and Higher-Layer Protocols
### 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 Biomedical 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
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>ARCH 542G</td>
<td>Construction II</td>
</tr>
<tr>
<td>ARCH 543G</td>
<td>Environmental Control Systems I</td>
</tr>
<tr>
<td>ARCH 544G</td>
<td>Environmental Control Systems II</td>
</tr>
<tr>
<td>ARCH 569G</td>
<td>Professional Practice I</td>
</tr>
</tbody>
</table>

**Chemistry**

Required Courses (6 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>CHEM 605</td>
<td>Advanced Organic Chemistry I: Structure</td>
</tr>
<tr>
<td>CHEM 661</td>
<td>Instrumental Analysis Laboratory</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CHEM 673</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>CHEM 777</td>
<td>Principles Pharm Chemistry</td>
</tr>
<tr>
<td>EVSC 616</td>
<td>Toxicology</td>
</tr>
<tr>
<td>EVSC 610</td>
<td>Environmental Chemical Science</td>
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</table>

**Mathematics**

Required Courses (6 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>MATH 545</td>
<td>Introductory Mathematical Analysis</td>
</tr>
<tr>
<td>MATH 546</td>
<td>Advanced Calculus</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 611</td>
<td>Numerical Methods for Computation</td>
</tr>
<tr>
<td>MATH 630</td>
<td>Linear Algebra and Applications</td>
</tr>
<tr>
<td>MATH 660</td>
<td>Introduction to statistical Computing with SAS and R</td>
</tr>
<tr>
<td>MATH 661</td>
<td>Applied Statistics</td>
</tr>
</tbody>
</table>

**Physics**

Required Courses (3 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>PHYS 611</td>
<td>Adv Classical Mechanics</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 621</td>
<td>Classical Electrodynamic</td>
</tr>
<tr>
<td>PHYS 641</td>
<td>Statistical Mechanics</td>
</tr>
<tr>
<td>PHYS 661</td>
<td>Solid-State Physics</td>
</tr>
<tr>
<td>PHYS 607</td>
<td>Topics in Astronomy and Cosmology</td>
</tr>
</tbody>
</table>

**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.