

**Technological Systems Management (TSM)**

**Major and Minor in Technological Systems Management**

*Department of Technology and Society, College of Engineering and Applied Sciences*

**Chairperson:** David L. Ferguson  
**Undergraduate Program Director:** Tian-Lih Teng  
**Administrator:** Rita Reagan-Redko  
**Office:** 347A Harriman Hall  
**Phone:** (631) 632-8770  
**E-mail:** Ted.Teng@stonybrook.edu and Rita.Reagan-Redko@stonybrook.edu  
**Web Address:** http://www.stonybrook.edu/est

---

**Faculty**

Joanne English Daly, Lecturer, M.S., Stony Brook University: Internet technology; computers in learning environments.

David L. Ferguson, Distinguished Service Professor, Ph.D., University of California, Berkeley: Quantitative methods; computer applications (especially intelligent tutoring systems and decision support systems); mathematics, science, and engineering education. Recipient of the State University Chancellor’s Award for Excellence in Teaching, 1992, President’s Award for Excellence in Teaching, 1992.

Joseph S. Hogan, Associate Professor Emeritus, Ph.D., New York University: Planetary atmospheres; environmental satellites; climate change.


Lester G. Paldy, Distinguished Service Professor, M.S., Hofstra University: Nuclear arms control; science policy.

Emil J. Piel, Professor Emeritus Ed.D, Rutgers University: Decision making; technology-society issues; human-machine systems.

Sheldon J. Reaven, Associate Professor, Ph.D., University of California, Berkeley: Science and technology policy; energy and environmental issues; environmental and waste management, risk analysis and life-cycle analysis; nuclear, chemical, and biological threats; technology assessment.

Herb Schiller, Lecturer, M.S. Management; Polytechnic University: M.S.M.E., California Institute of Technology: Operations management; manufacturing systems.

Glenn G. Smith, Assistant Professor, Ph.D., Arizona State University: Computer games, spatial visualization, distance education, and tactile output devices.

Tian-Lih Teng, Visiting Professor, Ph.D., University Of Pittsburgh: Electrical engineering; computer science; management of information systems; electronic commerce.

John G. Truxal, Distinguished Teaching Professor Emeritus, Sc.D., Massachusetts Institute of Technology: Control systems; technology-society issues.

Marian Visich, Jr., Professor Emeritus, Ph.D., Polytechnic Institute of Brooklyn: Aerospace engineering; technology-society issues.

**Affiliated Faculty**

William F. Collins, Neurobiology and Behavior

Gary Halada, Materials Science and Engineering

Gary Mar, Philosophy

Miriam Rafailovich, Materials Science and Engineering

Henry White, Materials Science and Engineering

**Adjunct Faculty**

**Estimated number:** 23

**Teaching Assistants**

**Estimated number:** 10

---

The Department of Technology and Society offers the major in Technological Systems Management leading to the Bachelor of Science degree. The program integrates a foundation in the natural sciences, engineering, applied sciences, or environmental studies with applications in technology systems, assessment, and management. The Department also offers a minor in Technological Systems Management.

The Department’s focus is on technological advances that shape every facet of modern life. Students develop understanding of the characteristics, capabilities, and limitations of current and emerging technologies. Successful practices in government, industry, education, and personal life depend on such understanding. The Department applies engineering concepts that underlie technological change and that form the bridge from engineering to other disciplines. In this multidisciplinary approach, the Department provides one of the vehicles by which Stony Brook interacts with other universities and colleges, pre-college institutions, professional schools, government, and industry. Effective management of modern technologies requires use of tools from many domains: science and engineering, information technologies, economics, legal and regulatory practice, psychology and sociology, design and assessment. The major prepares students for careers in government, industry, or education—in positions such as quality control specialist, systems or environmental analyst, technical sales representative, or technology trainer/educator—in short, all professions and business ventures that are dependent on technological applications and implementation and in which project management is key to success. Students are also prepared for advanced study in such areas as business, law, education, policy analysis, and industrial or environmental management.
Courses Offered in Technology and Society

See the Course Descriptions listing in this Bulletin for complete information.

EST 100  Computer Literacy in a Digital Era
EST 102-E  Weather and Climate
EST 104  Projects in Technology and Society
EST 192  Introduction to Modern Engineering
EST 194-C  Patterns of Problem Solving
EST 201-H  Technological Trends in Society
EST 202 Introduction to Science, Technology, and Society Studies
EST 210  Learning to Learn New Technologies
EST 291-H  Energy, Environment, and People
EST 300  Computer Modeling and Experiments in Mathematics and Science Education
EST 302  Assessment of Computer-Based Technologies
EST 303  Crisis Communications
EST 304 Communication for Engineers and Scientists
EST 305  Applications Software for Information Management
EST 320-H  Communication Technology Systems
EST 325-H  Technology in the Workplace
EST 330-H  Natural Disasters: Societal Impacts and Technological Solutions
EST 331 Professional Ethics and Intellectual Property
EST 391-H  Technology Assessment
EST 392-F  Engineering and Managerial Economics
EST 393  Project Management
EST 411-H  Science, Technology, and Arms Control
EST 412 Intelligence Organizations, Technology, and Democracy
EST 420 Seminar on Information-Age Society
EST 421 Starting the High-Technology Venture
EST 440 Interdisciplinary Research Methods

EST 441 Interdisciplinary Senior Project

EST 475 Undergraduate Teaching Practicum
EST 499 Research in Technology and Society

Acceptance into the Major in Technological Systems Management

Freshman and transfer applicants who have specified their interest in Technological Systems Management may be accepted directly into the major upon admission to the University. Applicants admitted to the University but not immediately accepted into the Technological Systems Management major may apply for acceptance at any time during the academic year by contacting the director of the undergraduate program. Students in good academic standing may apply in any semester but priority for admission to the major is given to those students who have: 1) completed AMS 161 and the second course in a natural science sequence, or their equivalents; 2) earned a grade point average of 2.50 in these courses; 3) received completed course evaluations for all transferred courses that are to be used to meet requirements of the major.

Sample Course Sequence for the Major in Technological Systems Management

<table>
<thead>
<tr>
<th>Freshman Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Seminar 101</td>
<td>1</td>
</tr>
<tr>
<td>EST 192</td>
<td>3</td>
</tr>
<tr>
<td>AMS 151</td>
<td>3</td>
</tr>
<tr>
<td>Natural Science 1</td>
<td>4</td>
</tr>
<tr>
<td>D.E.C. A</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EST Elective</td>
<td>3</td>
</tr>
<tr>
<td>AMS 102 *</td>
<td>3</td>
</tr>
<tr>
<td>EST 202</td>
<td>3</td>
</tr>
<tr>
<td>PHI 108 * (D.E.C. B)</td>
<td>3</td>
</tr>
<tr>
<td>Specialization course</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EST Elective</td>
<td>3</td>
</tr>
<tr>
<td>AMS 102 *</td>
<td>3</td>
</tr>
<tr>
<td>EST 202</td>
<td>3</td>
</tr>
<tr>
<td>Specialization course</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EST 440</td>
<td>3</td>
</tr>
<tr>
<td>Specialization course 300/400 level</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 110 *</td>
</tr>
<tr>
<td>EST 194</td>
</tr>
<tr>
<td>AMS 161</td>
</tr>
<tr>
<td>Natural Science 2</td>
</tr>
<tr>
<td>D.E.C.</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EST 305</td>
<td>3</td>
</tr>
<tr>
<td>CSE 110 *</td>
<td>3</td>
</tr>
<tr>
<td>Specialization course</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EST 392 (D.E.C. F)</td>
<td>3</td>
</tr>
<tr>
<td>EST 393</td>
<td>3</td>
</tr>
<tr>
<td>Specialization course</td>
<td>3</td>
</tr>
<tr>
<td>EST Elective</td>
<td>3</td>
</tr>
<tr>
<td>EST Elective</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EST Elective</td>
<td>3</td>
</tr>
<tr>
<td>Specialization course 300/400 level</td>
<td>3</td>
</tr>
<tr>
<td>Specialization course 300/400 level</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

* recommended course
Requirements for the Major in Technological Systems Management (TSM)

Students must complete a specialization in one of the following: natural science, engineering and applied science, or environmental studies. (For those students who have a major in one of those areas and who pursue Technological Systems Management as a second major, the first major will serve as the specialization.)

Completion of the major requires approximately 79 credits.

A. Mathematics

AMS 151, 161 Applied Calculus I, II
Note: The following alternate calculus course sequences may be substituted for AMS 151, 161:
MAT 125, 126, 127
or MAT 131, 132
or MAT 141, 142

B. Natural Sciences

One of the following sequences:
1. PHY 131/133 and PHY 132/134
   Classical Physics I, II and Laboratories
   Note: The following alternate physics course sequences may be substituted for PHY 131/133 and 132/134:
   PHY 121/123 and 122/124
   or PHY 125, 126, 127
   or PHY 141, 142
2. BIO 150 The Living World
   and BIO 201 Fundamentals of Biology: Organisms to Ecosystems
3. CHE 131, 132/133 General Chemistry I, II and lab
   or CHE 141, 142/143 Honors Chemistry I, II and Laboratories
4. GEO 102, 112 The Earth/Physical Geology Lab
   and GEO 309 Structural Geology
5. BIO 201 Principles of Biology:
   Organisms to Ecosystems
   and one of the following:
   GEO 101 Environmental Geology
   MAR 104 Oceanography
   ATM 102 Weather and Climate
   ENS 101 Prospects for Planet Earth

C. Study in Related Areas: Specialization

A cluster of seven related courses, totaling at least 21 credits, in one area of natural science, engineering, applied science, or environmental studies from a single department or program. At least three courses, totaling at least nine credits, must be at the 300 or 400 level.

D. Technological Systems Management

1. Required courses (10)
   EST 192 Introduction to Modern Engineering
   EST 194 Patterns of Problem Solving
   EST 202 Introduction to Science, Technology, and Society Studies
   EST 305 Applications Software for Information Management
   EST 325 Technology in the Workplace
   EST 391 Technology Assessment
   EST 392 Engineering and Managerial Economics
   EST 393 Project Management
   EST 391 Technology Assessment
   EST 392 Engineering and Managerial Economics
   EST 393 Project Management
   EST 440 Interdisciplinary Research Methods
   EST 441 Interdisciplinary Senior Project

2. Electives

Four from the following list:
   EST 300 Computer Modeling and Experiments in Mathematics and Science Education
   EST 302 Assessment of Computer-Based Technologies
   EST 303 Crisis Communication
   EST 304 Communication for Engineers and Scientists
   EST 320 Communication Technology Systems
   EST 330 Natural Disasters; Societal Impacts and Technological Solutions
   EST 331 Ethics and Intellectual Property
   EST 411 Science, Technology, and Arms Control
   EST 412 Intelligence Organizations, Technology, and Democracy
   EST 420 Seminar on Information-Age Society
   EST 421 Starting the High-Technology Venture

E. Upper-Division Writing Requirement

All degree candidates must demonstrate skill in written English at a level acceptable for Technological Systems Management majors. To satisfy this requirement, a TSM major must submit a paper written for an upper-division EST course for review. Students whose writing does not meet the required standard are referred for remedial help. The requirement may also be met by earning a letter grade of C or higher in a writing-intensive course approved by the Department or, if the student has a double major, by satisfying the upper-division writing requirement in the other major.

Grading

All courses taken to satisfy requirements A through D above must be taken for a letter grade. A grade of C or higher is required in all.

Requirements for the Minor in Technological Systems Management (TSM)

All students must complete four required EST courses and two or more EST electives (minimum 18 credits) with a g.p.a. of 2.50 or higher. No grade less than C may be used to meet the requirements for the minor. EST courses counted towards the requirements for a student’s major may not be counted towards the requirements for the TSM minor.

1. Four required courses:
   EST 192 Introduction to Modern Engineering
   EST 194 Patterns of Problem Solving
   EST 391 Technology Assessment
   EST 393 Project Management

2. Two electives from the following:
   EST 201 Technological Trends in Society
   EST 325 Technology in the Workplace
   EST 305 Applications Software for Information Management
   EST 392 Engineering and Managerial Economics

http://www.stonybrook.edu/ugbulletin