



A new course of study leading to M.S. in Technological Systems Management

## Energy Technology and Policy

Department of Technology and Society  
College of Engineering and Applied Sciences  
State University of New York at Stony Brook

The Department of Technology and Society offers a new course of study in Energy Technology and Policy (ETP). It leads to a Master of Science degree in Technological Systems Management (TSM). ETP is designed for students (including mid-career professionals) who are interested in energy issues from the perspectives of corporations, government, and non-governmental organizations. This course of study includes core courses that provide conceptual background in energy issues, technology management, decision making, public policy, and business strategy; topical courses in alternative energies, electric power systems, smart grids, advanced energy technologies and systems, environmental planning and management; and method courses including engineering economics, financial analysis and engineering, statistics and data analysis, technology assessment, and policy analysis. This program also requires a keystone project where students apply the knowledge learned in classroom to a current real-world energy issue.

ETP graduates are equipped with perspectives, methods, tools—and the ability to integrate them—that can enable them to better analyze and influence energy choices, and to initiate and better implement energy projects in the real world. When our graduate joins an engineering company, for instance, she/he will bring with deep understanding of the latest energy technologies, and many essential skills and knowledge to excel including scope definition, feasibility study, project design, and permit application.

ETP is offered as both a part-time and full-time program. A full-time

TOEFL: minimum 85 for masters programs  
GRE: required, with possible exception on a case-by-case basis

For tuition information, please see:  
<http://www.stonybrook.edu/bursar/tuition/grad.shtml>

To apply:  
[http://www.grad.sunysb.edu/admissions/app\\_info.shtml](http://www.grad.sunysb.edu/admissions/app_info.shtml)  
In “Admission Information” page, first choose “Technological Systems Management MS” from the dropdown menu, then enter “Energy Technology & Policy” in the “area of specialization” box.

Many new words about the *engineering system* (e.g., scale, scope, state, complexity, integration, architecture, resilience, evolution, affordability, social context) have been added to the language of engineering over the past decades, as observed by Charles M. Vest.

He argues that “...**the integration of what engineers know and can do with what social scientists, management experts, policy makers, citizen groups, lawyers, and politicians know and can do...is essential for a vibrant future.**”

--Dr. Charles M. Vest, President of National Academy of Engineering (NAE) and former President of MIT, Address at the 2011 NAE Annual Meeting. (see *Engineers: The Next Generation: Do We Need More? Who Will They Be? What will They Do?* in *The Bridge*, Winter 2011).

student can complete the program in one calendar year (three semesters including summer), or may extend up to two years to take additional courses for greater depth and breadth. Academic progress for part-time student is even more flexible. She/he can take two to three years to finish the program.

ETP has a flexible curriculum to accommodate the needs and interests of individual students. Working with the student, the faculty advisor designs a tailored curriculum for each individual student. Please see three sample curricula below. We also offer this program,

with a specially tailored curriculum, to a cohort of mid-career students on or near their work site.

## Degree requirements

To obtain M.S. in the ETP, a student must meet the following requirements:

- Complete a minimum of 30 post-baccalaureate credits;
- Complete *four* core courses: EST 581, EST 582, EST583, EST 592;
- Complete *five* elective courses, with one course from each group;
- Keystone project: complete the MS TSM project course EST 599; or an internship (at least one semester) in energy areas, plus an academic report on the internship.

### Core courses

<i>Fall</i>	EST	581	Methods of Socio-technological Decision Making
<i>Fall</i>	EST	592	Sustainable Energy: Technology, System, Market, & Policy
<i>Spring</i>	EST	582	System Approach (emphasis on Technology-Society Systems)
<i>Spring</i>	EST	583	Electric Power Systems

### Elective courses

Students must complete *five* elective courses, with *one* course from each of the Groups A - E below, and a keystone project. The following are partial lists of courses in each group. They will be regularly updated to add new courses that are appropriate to this course of study.

#### *Group A: science and engineering approach to energy systems*

EST 580 Advanced Technology Assessment: Business, Government, and Strategy  
MEC 506 Energy Management in Commercial Buildings  
MEC 515 Emerging Energy Technologies  
MEC 520 Energy Technologies Thermodynamics  
MEC 522 Building Energy Dynamics and Technology  
MEC 526 Modern Power Cycles (fall)

#### *Group B: environmental sciences and tools*

EST 584 Air pollution and air quality management  
EST 593 Risk assessment and hazard management  
EST 594 Diagnosis of environmental disputes  
EST 595 Principles of environmental systems analysis  
MAR 566 Atmospheric air pollution and its control  
MAR 587 GIS: display and analysis of environmental data

#### *Group C: quantitative methods and tools*

EMP 504 Quantitative Methods in Management  
POL 501 Introduction to statistics for public policy  
POL 502 Intermediate statistics for public policy  
MBA 503 Data Analysis and Decision Making  
MEC 507 Mathematical Methods in Engineering Analysis I  
AMS 507 Introduction to Probability  
AMS 510 Analytical Methods for Applied Mathematics and Statistics  
AMS 540 Linear Programming  
AMS 550 Stochastic Models  
AMS 553 Simulation and Modeling  
AMS 556 Dynamic Programming  
AMS 572 Exploratory Data Analysis

#### *Group D: economics, business, and management*

EST 546 Financing the Transition to a Low-Carbon Society (<http://nyepi.us/est546>)  
EMP 501 Behavioral and organizational aspects of management  
EMP 502 Management accounting and finance  
EMP 518 Project Management  
POL 509: Public budgeting and finance  
MBA 501: Managerial economics  
MBA 502: Finance  
MBA 504: Financial Accounting  
MBA 570: Entrepreneurship

*Group E: social sciences and public policy*

EST 600 Introduction to Technology, Policy, & Innovation (*special permission*)  
POL 531 Topics in public affairs: planning  
POL 535 Public policy analysis and evaluation  
POL 540 Data applications in public policy  
POL 542 Regional planning  
POL 543 Environmental politics and policy  
MBA 507 Law and ethics

*Group F: Keystone project: EST 599 Special Project or Internship*

Complete the MS TSM project course EST 599; or an internship (at least one semester) in energy or energy-related areas, plus an academic report on the internship.

## Sample curricula

### *For students planning a career in the finance sector*

1. EST 581 Methods of Socio-technological Decision Making
2. EST 582 System Approach (emphasis on Technology-Society Systems)
3. EST 583 Electric Power Systems
4. EST 592 Sustainable energy
5. EST 580 Advanced technology assessment (from Group A)
6. EST 595 Principles of environmental systems analysis (from Group B)
7. MBA 503 Data Analysis (from Group C)
8. EST 546 Financing the transition to a low-carbon society; *or*  
EMP 502 Engineering Economics and Financial Engineering (from Group D)
9. POL 535 Public policy analysis and evaluation (from Group E)
10. Keystone project: EST 599 or internship

### *For students planning for a career in governments*

1. EST 581 Methods of Socio-technological Decision Making
2. EST 582 System Approach (emphasis on Technology-Society Systems)
3. EST 583 Electric Power Systems
4. EST 592 Sustainable energy
5. EST 580 Advanced technology assessment (from Group A)
6. EST 594 Diagnosis of environmental disputes (from Group B)
7. POL 501 Introduction to statistics for public policy (from Group C)
8. POL 509 Public budgeting and finance (from Group D)
9. POL 535 Public policy analysis and evaluation (from Group E)
10. Keystone project: EST 599 or internship

*For students planning for a career in engineering companies*

1. EST 581 Methods of Socio-technological Decision Making
2. EST 582 System Approach (emphasis on Technology-Society Systems)
3. EST 583 Electric Power Systems
4. EST 592 Sustainable energy
5. EST 580 Advanced technology assessment (from Group A)
6. MAR 587 GIS: display and analysis of environmental data (from Group B)
7. AMS 553 Simulation and Modeling (from Group C)
8. EMP 502 Management accounting and finance (from Group D)
9. MBA 507 Law and ethics (from Group E)
10. Keystone project: EST 599 or internship

## What energy leaders said about ETP?

*"This is an excellent program. It is extremely important that our future leaders understand technology and that our future engineers understand the policy implications of new technologies and how to integrate them into society. This program links energy technology and policy, and has a flexible curriculum. Graduates will have great potential for a successful career as energy leaders."*

**Robert B. Catell**, Chairman, Advanced Energy Center; Former Chairman, U.S. National Grid; and Former Chairman and CEO, KeySpan Corp.

*"The multi-disciplinary structure and system approach of the new course of study will provide a more informed understanding of the complexity of Energy, a central determinant of economic development, environment and climate change. This new and timely course would improve the knowledge base for problem solving"*

**Nay Htun**, Ph.D, Research Professor, Department of Technology and Society, Stony Brook University; Fellow & Visiting Professor, Imperial College London, UK; Former UN Assistant-Secretary General, United Nations Development Programme, and United Nations Environment Programme.

*"[The TSM] program really broadened my view on how technology interacts with society and how we can take a more systemic approach to assess and manage the benefits and risks that technology brings to society. The friendly academic environment made it very easy for me to go through two important transitions, from Chinese culture to American culture, and from a technical discipline (mechanical engineering) to a more interdisciplinary and exciting field (technological systems management)."*

**Lan Xue** (TSM'86), Ph.D., Professor and Dean, School of Public Policy and Management, Tsinghua University, China.

## About Stony Brook University

Since its founding in 1957, Stony Brook University has established itself as one of America's most dynamic public universities, a center of academic excellence and an essential part of the region's economy. Now, transformed by a historic \$150 million gift from Jim and Marilyn Simons and the Simons Foundation — among the top 10 gifts to public higher education in America — Stony Brook is poised to accelerate its trajectory of excellence.

U.S. News & World Report ranks Stony Brook among the top 100 public universities in the nation, and the Times Higher Education World University Rankings places us among the top 1 percent of all the universities in the world. A member of the elite Association of American Universities, Stony Brook is one of the 61 top research institutions in North America.

Nobel laureates, Guggenheim fellows and MacArthur grant winners teach on our campus, making it a magnet for outstanding students. The University offers more than 150 undergraduate and 140 graduate programs and has 24,100 students.

Stony Brook's reach extends from its 1,040-acre campus on Long Island's North Shore — encompassing not only the main academic areas of the University, but also Stony Brook Medicine, which includes the schools of Dental Medicine, Health Technology and Management, Medicine, Nursing, and Social Welfare, as well as the Hospital, our major centers and institutes, programs and clinics and the Long Island State Veterans Home — to Stony Brook Manhattan, a Research and Development Park, four business incubators and our Southampton campus on Long Island's East End. Stony Brook also co-manages Brookhaven National Laboratory.

**For further information, please contact:**

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<http://www.stonybrook.edu/est/etp>