Masters in Energy Science, Technology and Policy: *pathways*

Spring 2017 Schedule -- **v1.5** NS 10/28/2016

Underlined Courses are available based on the *preliminary published schedule information for Spring 2017*. **BOLD Courses** are required for the CHE, MSE, & MEG disciplinary concentrations.

ENERGY CORE (24 units)

39-610 Energy Conversion & Supply (6)
39-613 Energy Transport & Storage (6)
39-611 Energy Demand &Utilization (6)
39-612 Energy Policy & Economics (6)

Wean Hall 5415 (TR 9:30-11:20)
39-611 A3-mini (Prof. Samaras)
39-612 A4-mini (Prof. Whitacre)

CONCENTRATION (36 units: **bold/required,** underlined/Spring`17)

Chemical Engineering

06-665 Process Systems Modeling (12) MW 1:30-3:20
06-623 Math. Mod. Chem.E. Process(12)
06-625 Chemical & Reactive Systems (12)
06-663 Analysis & Modeling Trans. Phenom. (12) MW 4:30-6:20
06-713 Math Techniques in Chem. Engr.(12)
06-705 Adv. Chem. Eng. Thermo (12)
06-702 Advanced Reaction Kinetics (12) MW 4:30-6:20
06-703 Advanced Fluid Dynamics (12)
06-704 Heat and Mass Transfer (12) MW 11:30-1:20
06-720 Adv. Process Systems Eng. (12) MW9:30-11:20

Civil & Environmental Engineering

12-704 Prob & Est Methods for Engr Sys (12)
12-706 Civil Systems Invest. Plan & Pricing (12)
12-712 Intro to Sustainable Engineering (12)
12-740 Data Acquisition (6A1)
12-741 Data Management (6-A2)
12-742 Data Mining in Infrastructure (6)
12-743 Comp. Search & Decision in Civil Infrastructure (6)
12-745 AIS Systems Prep/Project (12) MW 4:30-6:20
12-711 Adv. Project Management for Constr (12)
12-714 Environ. Life Cycle Asst. (12)MW 9-10:20
12-749 S.T. Climate Change Adapt. (6A4 TR12-1:20)
12-750 Infrastructure Systems (12) TR 3-4:20
12-751/651 Air Quality Engr. (12) MWF 12:30-1:20
12-752 S.T. Data Drv Bldg Energy Man (6A2)

Electrical & Computer Engineering

18-418 El. Energy Processing: Fundamentals & App. (12ug) MW 12:30-2:20
18-618 Smart Grids & F. El. Eng. Sys (12)
18-630 Intro to Security & Policy (12)
18-649 Distr. Embedded Systems (12)
18-730 Intro Computer Security (12)
18-731 Network Security (12) MW 12:30-2:20
18-587 Elec. Energy Conv, Cntrl & Mgmt (12ug)
18-819B Solar: Model, Analysis, Dsgn
18-631 Intro to Info Security (12)
18-771 Linear Systems (12)
18-777 Complex Large-Scale Dynam Sys(12)
18-879M Optim in Energy Networks (12)
18-879S Networked Control Systems (12)
18-875 Econ & Engr Electric Energy Systems (12) MW 6:30-8:20
18-882A S.T.Power Electronics (12)
18-418 Electric Energy Processing (12)

Engineering & Public Policy

19-612 Int. Life Cycle Assessment (12)
19-617(12-250) Infrastructure Mgmt. (12) TR 3-4:20
19-624 S.T. Emerging Energy Policy (12)
19-625 Sust. Energy for the Dev. World (12)
19-683 S.T. Sci, Tech, & Innov. Policy (6A2)
19-696 S.T. Sus Dev & Innovation (9)
19-717 (12-712) Intro Sustainable Engr (12)
19-736 (27-726) Energy & Materials in Policy (6)
19-740 (24-740) Cmbstn & Air Pollut Ctrl (12)
19-638 (18-618) Smart Grids & F. Elec. (12)
19-882 S.T. Sem. Low Carbon Elec. Power (6) A4 TR 1:30-3:20
19-626 Climate Science & Policy (12)
19-653 (24-640) S.T. Climate Change Mit (12) MW 9:30-11:20
19-656 S.T. CO2 Capture & Sequestration (6) A3 TR 12-1:20
19-655 S.T. Climate Change Sci & Adapt.(12)
19-714 (12-714) Env. Life Cycle Assmt. (12) MW 9-10:20
19-724 (27-724) Materials Energy Storage (6) A3 MW 1:30-3:20
19-739 (18-875) Engr&Econ Elec Engy Sys(12) MW 6:30-8:20
19-751 (12-751) Air Quality Engr. (12) MWF 12:30-1:20
19-424 (24-424) Energy & Environment (*9ug*)
19-472 Fund. Electric Pwr Sys *(12ug)*

Materials Science and Engineering

27-705 Nanostructured Mat. (12) TR 1:30-3:20
27-718 Soft Materials (12)
x27-721 Processing Design (6A2)
27-724 Materials for Energy Storage (6) A3 MW 1:30-3:20
27-725 Materials in Nuclear Systems (6) A3 MW 1:30-3:20
27-727 Mechanical Behavior in Extreme Env.(6)
27-728 Materials for Future Energy Sys (6A1)
27-729 Solid State Dev. Energy Conv.(6A2)
27-730 Energy Consum. & Min. Metals Prod(6)
27-752 Fnd. of Semicond. Nanostructures (12) MW 2:30-4:20
27-765 Special Topics: Materials & Society (6)
27-766 Diffusions in Materials (6A2)
27-788 Defects in Materials (6A1)
27-794 Chem. Stab. Materials Extr. Env. (6)
27-796 Structure of Materials
27-798 Thermodynamics I (6A1)
27-799 Thermodynamics II (6A2)

Mechanical Engineering

24-722 Energy System Modeling (12)
24-616 Tribology-Fric. Lubric. & Wear (12)
24-628 Energy Trans+Conv Nano-scale (12) MW9:30-11:20
24-721 Advanced Thermodynamics (12)
24-731/733 Conductive/Radiative Heat Transfer (6)
24-736 Two-Phase Flow & Heat Transfer (-)
24-642 Fuel Cell Systems (12)
24-644 S.T. Adv. Power Plant Design
24-640 Climate Change Mitigation (12) MW9:30-11:20
24-711 Fluid Mechanics I (12)
24-718 Computational Fluid Dynamics (12) MW 11:30-1:20
24-730 Advanced Heat Transfer (12)
24-732 Convective Heat Transfer (6)
24-740 Combustion & Air Pollution (12)
24-629 Dir Solar & Therm Energy Conv (12)

BREADTH ELECTIVES

EST&P and EST&P-AS Degrees:

36 units of relevant grad-level engineering courses,

including up to 18 units of pre-approved energy related courses from outside the college of engineering

also for the EST&P-AS Degree (3 semesters):

additional **24 units** of faculty-supervised master's project, independent study, internship, and/or specific pre-approved engineering project courses

M.S. EST&P

M.S. EST&P-AS
(Applied Studies)

Energy Science Technology & Policy
Carnegie Mellon University
College of Engineering