

POTENTIAL TECHNICAL ELECTIVES FOR CLIMATE & SPACE UNDERGRADUATES*

All Degrees and Concentrations

EECS 283	Programming for Science and Engineering (4)
CEE 303	Computational Methods for Engineers and Scientists (4)
MATH 371 or MATH 471	Numerical Methods for Engineers and Scientists (3) / Introduction to Numerical Methods (3)
STATS 426	Introduction to Theoretical Statistics (3) (pre-requisite is cross-listed class STATS/MATH 425)
400+ level MATH classes	
NRE 441 (ENVIRON 441)	Remote Sensing of the Environment (4)

Climate & Meteorology Degree

Climate Science and Impacts Concentration

CLIMATE/SPACE 381 Undergraduate Research Experience II (1-4)
CLIMATE/SPACE 401 (EARTH 401) Geophysical Fluid Dynamics (4)
CLIMATE 411 Cloud & Precip (3)
CLIMATE 414 (EARTH 414) Weather Systems (3)
CLIMATE 420 (NAVARCH 420) (ENSCEN 420) Environmental Ocean Dynamics (4)
AOSS 421 / EARTH 421/ ENVIRON 426 Introduction of Physical Oceanography (3)
CLIMATE 422 (EARTH 423) Boundary Layer Meteorology (4)
CLIMATE 440 (EARTH 454) Meteorological Analysis Laboratory (4)
CLIMATE 451 (ENSCEN 451) (EARTH 457) Atmospheric Dynamics I (4)
CLIMATE/SPACE 462 Instrumentation for Atmospheric and Space Sciences (4)
CLIMATE 463 Air Pollution Meteorology (3)
CLIMATE 473 Climate Physics (3)
CLIMATE 474 (EARTH 474) Ice Sheets, Glaciers and Climate (3)
CLIMATE 475 (ENSCEN 475) (EARTH 475) Earth System Interactions (4)
AOSS 476 Ocean Dynamics and Climate (4)
CLIMATE 479 (ENSCEN 479) Atmospheric Chemistry (4)
CLIMATE 480 (NRE 480) Climate Change: The Move to Action (3)
SPACE 495 (ENSCEN 495) Upper Atmosphere and Ionosphere (4)
CLIMATE/SPACE 499 Directed Study for Undergraduate Students (1-3)
CLIMATE 530 Using Climate-Change Knowledge in Planning and Design (1-2) (Senior)
CLIMATE/SPACE 532 Radiative Transfer I (3) (Need permission of instructor)
CLIMATE 578 Air Pollution Chemistry (3) (Enforced pre-requisites)
SPACE 584 Instrumentation & Analysis Techniques (4)
CLIMATE/SPACE 585 Introduction to Remote Sensing and Inverse Theory (3)
CLIMATE 587 Microwave Remote Sensing 1: Radiometry (3) (Need permission of instructor)
ARCH/UP 357 Architecture, Sustainability and the City, Ideas, Forces and People Shaping the Built Environment (3)
CEE 230 Energy and Environment (3)
CEE 265 Sustainable Engineering Principles (3)
CEE 270 Statistical Methods for Data Analysis and Uncertainty Modeling (4)
CEE 303 Computational Methods for Engineers and Scientists (4)
CEE 307 Sustainable Cities (3)

CEE 565 Seminars on Energy Science, Technology & Policy (3)
 CEE/CHE 686 Case studies in Environmental Sustainability (3)
 EARTH 325 / ENVIRON 325 Environmental Geochemistry (3)
 EARTH 331 / ENVIRON 321 Climate and Climate Change (4)
 EARTH 341 / ENVIRON 341 Ecosystem Science in the Rockies (5)
 EARTH 344 / ENVIRON 344 Sustainable and Fossil Energy: Options and Consequences (3)
 EARTH 420 Introductory Earth Physics (3)
 EARTH 422 Principles of Geochemistry (3)
 EARTH 443 Climate Tectonics and the Earth's Surface (4)
 EARTH 446 Paleoclimatology (3)
 EARTH 452 Paleoclimatology (3)
 EECS 280 Programming and Introductory Data Structures (4)
 EECS 281 Data Structures and Algorithms (4)
 EECS 282 Information Systems Design and Programming (4)
 EECS 283 Programming for Science and Engineering (4)
 EECS 381 Object Oriented and Advanced Programming (4)
 EECS 401 Probabilistic Methods in Engineering (4)
 EECS 402 Computer Programming For Scientists and Engineers (3)
 EECS 477 Introduction to Algorithms (4)
 ENGR 301 Engineering Undergraduate Study Abroad (1-16)
 ENGR 403 Scientific Visualization (3)
 ENGR 405 (CHE 405) Problem Solving and Troubleshooting in the Workplace (3)
 ENGR 450 Multidisciplinary Design (4)
 ENGR 455 Multidisciplinary Engineering Design II (1-5)
 ENGR 456 Mentorship-Leadership in Multidisciplinary Design (1-3)
 ENGR 521 Clean Tech Entrepreneurship (3)
 ENVIRON 302 Topics in Environmental Social Science (**Topic often changes; check with advisor if current topic is relevant**) (4)
 ENVIRON 303 Topics in Environmental Natural (**Topic often changes; check with advisor if current topic is relevant**) (3)
 ENVIRON 312 / POLSCI 380 Environmental Politics and Policy (3)
 ENVIRON 312 Environmental Politics and Policy (3)
 ENVIRON 320 Environmental Journalism: Reporting About Science Policy and Public Health (3)
 ENVIRON 365 International Environmental Policy (3)
 ENVIRON 367 Global Enterprise & Sustainable Development (3)
 ENVIRON 404 Cars Sustainability and Energy Conversion (3)
 ENVIRON 412 Environmental Values in Public Policy(3)
 ESENG 567 Energy Infrastructure Systems (3)
 IOE 265 Probability and Statistics for Engineers (4)
 IOE 366 Linear Statistical Models (2)
 MATH 354 Fourier Analysis and its Applications (3)
 MATH 371 / ENGR 371 Numerical Methods for Engineers and Scientists (3)
 MATH 404 Intermediate Differential Equations and Dynamics (3)
 MATH 412 Introduction to Modern Algebra (3)
 MATH 417 Matrix Algebra I (3)

MATH 419 Linear Spaces and Matrix Theory (3)
 MATH 420 Matrix Algebra II (3)
 MATH 425 / STATS 425 Introduction to Probability (3)
 MATH 450 Advanced Mathematics for Engineers I (4)
 MATH 454 Boundary Value Problems for Partial Differential Equations (3)
 MATH 471 Introduction to Numerical Methods (3)
 MECHENG 320 Fluid Mechanics I (3)
 MECHENG 335 Heat Transfer (3)
 MECHENG 336 Thermodynamics II (3)
 MECHENG 420 Fluid Mechanics II (3)
 NRE 475 Environmental Law (3)
 NRE 480 Climate Changes: The Move to Action (3)
 NRE 501.041 Climate Policy (3)
 NRE 501.060 Environmental Regulation (1.5)
 NRE 523 Ecological Risk Assessment (F) (3)
 NRE 531 Principles of GIS (4)
 NRE 541 Remote Sensing of Environment (4)
 NRE 550 Systems Thinking for Sustainable Development (3)
 NRE 555 Climate and Development: Impacts, Mitigation and Adaptation in Less Developed Countries (3)
 NRE 567 (it was NRE 501.032) Transportation Energy & Climate Policy (3)
 NRE 574 Sustainable Energy Systems (3)
 or AOSS 420 Environmental Ocean Dynamics (4)
 or EARTH 421 Principles of Physical Oceanography (3)
 or EARTH 452 Paleoclimatology (3)
 PHYSICS 481 Science Technology and Public Policy (3)
 STATS 250 Introduction to Statistics and Data Analysis (4)
 STATS 280 Honors Introduction to Statistics and Data Analysis (4)
 STATS 400 Applied Statistical Methods (4)
 STATS 401 Applied Statistical Methods II (4)
 STATS 403 Introduction to Quantitative Research Methods (4)
 STATS 406 Introduction to Statistical Computing (4)
 STATS 412 Introduction to Probability and Statistics (3)
 STATS 415 Data Mining and Statistical Learning (4)
 STATS 480 Survey Sampling Techniques (4)
 TechComm 401 Special Topics Strategic Planning & Proposal Writing (4)
 TechComm 450 Web Page and Site Design (4)
 TechComm 498 Technical and Professional Writing for Industry Government and Business (3)

Climate & Meteorology Degree

Meteorology Concentration

CLIMATE 420 ((NAVARCH 420)) Environmental Ocean Dynamics (4)
 CLIMATE 441 3-week S/S course at UM Camp Davis, Wyoming: Mountain Meteorology and Climate of the Rockies (3)
 CLIMATE/SPACE 450 Geophysical Electromagnetics (4)
 CLIMATE 463 (ENSCEN 463) Air Pollution Meteorology (3)

CLIMATE 467 Biogeochemical Cycles (3)
CLIMATE 479 Atmospheric Chemistry (3)
CLIMATE/SPACE 499 Directed study, research project with faculty member (1-4)
CLIMATE/SPACE 605 Current topics, check each term
ENGR 450 Multidisciplinary Design (4)
GEOSCI 325 Environmental Geochemistry (3)
GEOSCI 341 (ENVIRON 341) 4-week summer course at UM Camp Davis, Wyoming: Ecosystem Science in the Rockies (5)
GEOSCI 420 Introductory Earth Physics (3)
GEOSCI 421 Principles of Physical Oceanography (3)
GEOSCI 422 Principles of Geochemistry (3)
GEOSCI 442 Earth Surface Processes and Soils (4)
STATS/MATH 425 (if STATS 350 or STATS 412 is used for STATS requirement)
Introduction to Probability (3)
MATH 450 Advanced Mathematics for Engineers (4)
STATS 350 or STATS 412 (if STATS/MATH 425 is used for STATS requirement)
Introduction to Statistics and Data Analysis

Space Sciences and Engineering Degree

AEROSP 305 Aerospace Engineering Laboratory I (4)
AEROSP 335 Aircraft and Spacecraft Propulsion (4)
AEROSP 347 Space Flight Mechanics (3)
AEROSP 384 Introduction to Solid Modeling and CAD (3)
AEROSP 405 Aerospace Laboratory II (4)
AEROSP 450 Flight Software Systems (3)
AEROSP 483 Space System Design (4)
AEROSP 484 Computer Aided Design (4)
CEE 211 Statics and Dynamics (4)
CEE 212 Solid and Structural Mechanics (4)
CEE 265 Sustainable Engineering Principles (3)
CEE 270 Statistical Methods for Data Analysis and Uncertainty Modeling (4)
CEE 303 Computational Methods for Engineers and Scientists (4)
CEE 319 Sensors Electrical Circuits and Signal Processing (3)
CEE 325 Fluid Mechanics (4)
EECS 230 Electromagnetics I (4)
EECS 280 Programming and Introductory Data Structures (4)
EECS 281 Data Structures and Algorithms (4)
EECS 282 Information Systems Design and Programming (4)
EECS 283 Programming for Science and Engineering (4)
EECS 311 Electronic Circuits (4)
EECS 314 Electrical Circuits Systems and Applications (4)
EECS 330 Electromagnetics II (4)
EECS 334 Principles of Optics (4)
EECS 381 Object Oriented and Advanced Programming (4)
EECS 401 Probabilistic Methods in Engineering (4)

EECS 402 Computer Programming For Scientists and Engineers (3)
 EECS 430 (AOSS 431) Radiowave Propagation and Link Design (4)
 EECS 451 Digital Signal Processing and Analysis (4)
 EECS 461 Embedded Control Systems (4)
 EECS 477 Introduction to Algorithms (4)
 EECS 492 Introduction to Artificial Intelligence (4)
 ENGR 280 Undergraduate Research (1-4)
 ENGR 301 Engineering Undergraduate Study Abroad 1-16 credits
 ENGR 354 Engineering Design Practice (1)
 ENGR 355 Multidisciplinary Engineering Design I (1-4)
 ENGR 371 (MATH 371) Numerical Methods for Engineers and Scientists (3)
 ENGR 391 Directed Overseas Study 1-(3)
 ENGR 403 Scientific Visualization (3)
 ENGR 405 (CHE 405) Problem Solving and Troubleshooting in the Workplace (3)
 ENGR 450 Multidisciplinary Design (4)
 ENGR 455 Multidisciplinary Engineering Design II 1-(5)
 ENGR 456 Mentorship-Leadership in Multidisciplinary Design 1-(3)
 IOE 265 Probability and Statistics for Engineers (4)
 IOE 366 Linear Statistical Models (2)
 IOE 373 Data Processing (4)
 IOE 465 Design and Analysis of Experiments (3)
 MATSCIE 330 Thermodynamics of Materials (4)
 MECHENG 235 Thermodynamics (3)
 MECHENG 250 Design and Manufacturing I (4)
 MECHENG 305 Introduction to Finite Elements in Mechanical Engineering (3)
 MECHENG 320 Fluid Mechanics I (3)
 MECHENG 335 Heat Transfer (3)
 MECHENG 336 Thermodynamics II (3)
 MECHENG 350 Design and Manufacturing II (4)
 MECHENG 420 Fluid Mechanics II (3)
 NERS 472 Fusion Reactor Technology (3)
 TechComm 300 Technical Communication for Electrical and Computer Science (1)
 TechComm 401 Special Topics Strategic Planning & Proposal Writing (4)
 TechComm 450 Web Page and Site Design (4)
 TechComm 499 Scientific and Technical Communication elective credit only
 MATH 289 - Problem Seminar (1)
 MATH 316 - Differential Equations (3)
 MATH 351 - Principles of Analysis (3)
 MATH 354 - Fourier Analysis and its Applications (3)
 MATH 371 - Numerical Methods for Engineers and Scientists (3)
 MATH 404 - Intermediate Differential Equations and Dynamics (3)
 MATH 416 - Theory of Algorithms (3)
 MATH 417 - Matrix Algebra I (3)

MATH 419 - Linear Spaces and Matrix Theory (3)
MATH 425 - Introduction to Probability (3)
MATH 450 - Advanced Mathematics for Engineers I (4)
MATH 454 - Boundary Value Problems for Partial Differential Equations (3)
MATH 471 - Introduction to Numerical Methods (3)
PHYSICS 341 - Waves Heat and Light Lab (2)
PHYSICS 390 - Introduction to Modern Physics (3)
PHYSICS 401 - Intermediate Mechanics (3)
PHYSICS 402- Optics (3)
PHYSICS 405 - Intermediate Electricity and Magnetism (3)
PHYSICS 406 - Statistical and Thermal Physics (3)
PHYSICS 411 - Introduction to Computational Physics (3)
PHYSICS 413 - Introduction to Nonlinear Dynamics and the Physics of Complexity (3)
PHYSICS 453 - Quantum Mechanics (3)
PHYSICS 460 - Quantum Mechanics II (3)
STATS 250 - Introduction to Statistics and Data Analysis (4)
STATS 280 - Honor Introduction to Statistics & Data Analysis (4)
STATS 400 - Applied Statistical Methods (4)
STATS 401 - Applied Statistical Methods II (4)
STATS 403 - Introduction to Quantitative Research Methods (4)
STATS 406 - Introduction to Statistical Computing (4)
STATS 412 - Introduction to Probability and Statistics (3)
STATS 415 - Data Mining and Statistical Learning (4)
STATS 425 - Introduction to Probability (3)
STATS 470 - Introduction to the Design of Experiments (4)
STATS 480 - Survey Sampling Techniques (4)

*Other courses are possible, please see your advisor for approval.
