UNDERGRADUATE ENERGY CONCENTRATIONS IN THE WILLIAM STATES LEE COLLEGE OF ENGINEERING

The Lee College of Engineering is a national leader in academic and research programs related to the many elements of energy production, distribution and markets. This interdisciplinary expertise is united in UNC Charlotte’s Energy Production and Infrastructure Center (EPIC). Working in collaboration with the many energy engineering companies in the Charlotte, North Carolina, region, EPIC brings together students, faculty and energy professionals.

Educating engineering students to work in the many exciting areas of energy is an important mission of the Lee College of Engineering and EPIC. At the bachelor’s degree level, all of the college’s engineering departments offer energy-related concentrations. These concentrations develop highly sought-after energy professionals who are more marketable and adaptable to the changing marketplace for engineers.

CIVIL ENGINEERING

B.S.C.E. students may apply for the Concentration in Energy Infrastructure after their freshman year. Concentration students must complete the following core courses:

- CEGR 4122 Power Plant Design
- CEGR 4246 Energy and the Environment
- ECGR 2161 Basic Electrical Engineering I
- MEGR 3111 Thermodynamics

Additionally, students must complete at least one course from the following electives:

- CEGR 4090 Air Pollution
- CEGR 4108 Finite Element Analysis and Applications
- CEGR 4121 Prestressed Concrete Design
- CEGR 4146 Advanced Engineering Hydraulics
- CEGR 4162 Transportation Planning
- CEGR 4182 Transportation Environmental Assessment
- CEGR 4222 Structural Steel Design II
- CEGR 4226 Reinforced Concrete Design II
- CEGR 4247 Sustainable Design

For more information contact Dr. Milind Khire at mkhire@uncc.edu or see the Civil and Environmental Engineering website.
ELECTRICAL ENGINEERING

B.S.E.E. students may apply to the Power and Energy Concentration after successfully completing their sophomore year with a GPA of at least 3.0. Additionally, during the senior year, Power and Energy Systems Concentration students must complete an intensive, two-semester energy-related senior design project. Application for the concentration takes place during the semester that the student is enrolled in ECGR 3142 Electromagnetic Devices.

To be admitted to the program, students must have completed:
- PHYS 2102 Physics II
- MATH 1241 Calculus I
- MATH 1242 Calculus II
- MATH 2241 Calculus III
- MATH 2164 Matrices and Linear Algebra
- ECGR 2112 Network Theory II

Students must enroll in the following prerequisite courses:
- ECGR 3142 Electromagnetic Devices
- ECGR 3112 Systems Analysis II

Students must enroll in the following Power and Energy courses in order to earn the concentration:
- ECGR 4141 Power Systems Analysis I
- Concentration Technical Elective Courses (6 hours) - Select two of the following:
  - ECGR 4104 Computational Methods in Power Systems
  - ECGR 4113 Modeling and Analysis of Dynamic Systems
  - ECGR 4123 Analog and Digital Communication
  - ECGR 4142 Power System Analysis II
  - ECGR 4143 Electrical Machinery
  - ECGR 4144 Power Electronics I
  - ECGR 4151 Solar Cell Fundamentals and Technology
  - ECGR 4171 Introduction to Energy Systems
  - ECGR 4172 Energy Markets
  - ECGR 4190 Power Generation Operation and Control
  - ECGR 4191 Dynamic and Transient Analysis of Power System

For more information contact Dr. Robert Cox at robert.cox@uncc.edu.

MECHANICAL ENGINEERING

B.S.M.E. students may apply to the Energy Engineering Concentration after successfully completing their third semester with a GPA of at least 3.0. Application for the concentration takes place during the semester the student is enrolled in MEGR 2499 Energy Engineering Clinic I. For the concentration, students take the additional survey course in energy MEGR 2499, as well as focus their four technical electives and senior design project in the area of energy.

Students must take four approved energy technical electives, from the following:
- MEGR 3210 Automotive Power Plants
- MEGR 3214 Refrigeration and A/C
- MEGR 3225 Introduction to Finite Element Analysis
- MEGR 3237 Introduction to Control Systems
- MEGR 3282 Statistical Process Control and Metrology
- MEGR 3451 Stationary Power Plant Systems
- MEGR 3452 Introduction to Nuclear Engineering
- MEGR 3260 Clean coal technology
- MEGR 3261 Sustainable Energy Production
- MEGR 3262 Turbomachinery
- PHYS 4110 Nuclear Physics

During the senior year, energy engineering students enroll in MEGR 3455/3456 Energy Senior Design I/II and complete an intensive, two-semester energy-related engineering project. These clinic courses are equivalent to Senior Design I/II in the BSME plan of study.

For more information contact Dr. Kevin Lawton at kmlawton@uncc.edu, or the Mechanical Engineering website. To apply to add the concentration visit https://mees.uncc.edu/current-students/advising-and-program-resources/applying-mees-concentration.

SYSTEMS ENGINEERING

B.S.S.E. students may apply to the Energy Systems Concentration at the end of their sophomore year and then take energy systems-related courses in their junior and senior years.

Energy Systems Concentration students take the following four courses:
- SEGR 4961 Introduction to Energy Systems
- SEGR 4962 Energy Markets
- SEGR 4963 Energy Systems Planning
- SEGR 4964 Case Studies in the Energy Industry

In addition to the above concentration courses, students can take energy-related electives from other departments per approval by their advisor. For more information contact Dr. Nickcoy Findlater at nafindla@uncc.edu or visit the Systems Engineering website.