Engineering Science - B.S.

Curriculum for a Comprehensive Major in Engineering Science

Students in the program must select one of two areas of concentration: Environmental Engineering or Systems Engineering. Student must satisfy requirements for their selected concentration, for the Engineering Science core, and for the Shepherd University Core Curriculum.

Total hours required (including free electives).....120

Engineering Science Core, 45 Hours

Specific Core Curriculum 20

ENGR 100 Freshman Seminar 1
ECON 205 Principle of Macroeconomics 3
MATH 207 Calculus I 4
PHYS 221, 221L General Physics I 4
PHYS 222, 222L General Physics II 4
CHEM 207, 207 L General Chemistry I.....4

Mathematics and Engineering Requirements.....….28

ENGR 101 Engineering I.....3
ENGR 102 Engineering II 3
ENGR 221, 222L Introduction to Electrical Engineering 4
MATH 208 Calculus II.....4
MATH 307 Linear Algebra 3
MATH 309 Calculus III……..4
MATH 310 Differential Equations.....4
ENGR 489 Engineering Capstone Project I.....1
ENGR 490 Engineering Capstone Project II 2

Environmental Engineering Concentration, 53 Hours

The Environmental Engineering concentration is designed to prepare the student for a future in application of engineering technology to environmental issues and problems. The need for trained environmental engineers is illustrated through the numerous employment opportunities available for individuals trained in this field in industry, at state and federal agencies, and with environmental consulting firms.

Environmental and Physical Science Requirements 32

ENVS 201-201L Foundations of Environmental Science II.....4
ENVS 202-202L Foundations of Environmental Science II.....4
ENVS 341 Sustainable Energy and Lab.....4

ENVS 390 Geographic Information Systems 4
ENVS 441 Hydrology and Lab 4
PHYS 301 Energy 4
CHEM 209, 209L General Chemistry II 4
CHEM 333, 333L Environmental Chemistry.....4

Mathematics and Engineering Requirements.....21
ENGR 241 Engineering Statics.....3
ENGR 242 Engineering Dynamics 3
ENGR 243 Mechanics of Materials 3
ENGR 301 Engineering Thermodynamics*.....3
* OR ENGR 351 Fluid Mechanics.....3
MATH 314 Statistics.....3
MATH 329 Mathematical Modeling+ 3
+OR CPE 492 Cooperative Work Experience in Computer Science and Engineering.....3

Systems Engineering Concentration, 54 Hours

Systems Engineering is an interdisciplinary approach in understanding technical aspects in engineering process and design. System Engineering is a key component in systems implementation and management that enables the realization of successful systems. Improving business strategies of integrated systems requires solid foundations in mathematical tools, computer modeling and networking, and operation research.

Specific Core Curriculum 3
ECON 207 Principle of Microeconomics 3

Mathematics and Engineering Requirements.....21
MATH 254 Discrete Mathematics 3
MATH 318 Numerical Analysis 3
MATH 321 Probability and Statistics 3
MATH 329 Mathematical Modeling 3
MATH 354 Operations Research 3
ENGR 224, 225L Electrical Circuits 4
ENGR 300 - Introduction to Robotics 3

CIS Requirements 21
CIS 104 Introduction to CIS 3
CIS 211 Computer Language Concepts 3
CIS 287 System Analysis and Design 3
CIS 314 Advanced Computer Language Concepts 3
CIS 321 Data and File Structures 3
CIS 418 Management Information Systems 3
CIS 486 Software Engineering 3

Restricted Elective Courses 10

ENGR 241 Engineering Statics 3
ENGR 242 Engineering Dynamics 3
ENGR 305 Digital Logic Circuits 4
ENGR 350 Robotics Seminar .....Up to 3
ENGR 326 Linear Systems 3
CIS 310 Information Security 3
CIS 388 Database Management System 4
CIS 390 Operating System 3
CPE 234 Introduction to Networking 3
CPE 386 Computer Organization 4
CPE 433 Microprocessor System Design and Lab 4
CPE 482 Real Time and Embedded System Design..... 3
DATA 418 Big Data Analytics 3