

Courses that will satisfy the revised Applied Physics and Engineering Track for the Physics major

January 10, 2018; Revised November 1, 2018
Contact person: Owen Long (owen.long@ucr.edu)

The Applied Physics and Engineering Track for the B.S. degree for the Physics major will be changed to require the following:

1. Additional upper- and lower-division requirements (16 units).
 - a) 16 units of approved Engineering electives including a minimum of 8 units at the upper-division level.

The courses listed below are all approved for the track. Courses not listed may be approved by a physics faculty academic advisor.

Computer Science, lower division

CS 010 Introduction to computer science for science, mathematics, and eng. (4)
CS 011 Introduction to Discrete Structures (4)
CS 012 Introduction to computer science for science, mathematics, and eng. II (4)
CS 013 Introductory computer science for engineering majors (4)
CS 014 Introduction to data structures and algorithms (4)
CS 030 Introduction to computational science and engineering (4)
CS 061 Machine organization and assembly language programming (4)

Computer Science, upper division

CS 100 Software construction (4)
CS 111 Discrete structures (4)
CS 120A Logic design (5)
CS 120B Introduction to embedded systems (4)
CS 121 Programming embedded systems (4)
CS 121L Laboratory in programming embedded systems (2)
CS 122A Intermediate Embedded and Real-Time Systems (5)
CS 122B Advanced Embedded and Real-Time Systems (5)
CS 130 Computer graphics (4)
CS 134 Video game creation and design (4)
CS 141 Intermediate data structures and algorithms (4)
CS 145 Combinatorial optimization algorithms (4)
CS 150 Automata and formal languages (4)
CS 152 Compiler design (4)
CS 153 Design of operating systems (4)
CS 160 Concurrent programming and parallel systems (4)
CS 161 Design architecture of computer systems (4)
CS 161L Laboratory in Design and Architecture of Computer Systems (2)
CS 162 Computer Architecture (4)

CS 164 Computer Networks (4)
CS 165 Computer Security (4)
CS 166 Database Management Systems (4)
CS 168 Introduction to Very Large Scale Integration (VLSI) Design (4)
CS 169 Mobile Wireless Networks (4)
CS 171 Introduction to Machine Learning and Data Mining (4)
CS 172 Introduction to Information Retrieval (4)
CS 175 Entrepreneurship in Computing (4)
CS 177 Modeling and Simulation (4)
CS 179 (E-Z) Project in Computer Science (4)
CS 179E Compilers (4)
CS 179F Operating Systems (4)
CS 179G Database Systems (4)
CS 179-I Networks (4)
CS 179J Computer Architecture and Embedded Systems (4)
CS 179K Software Engineering (4)
CS 179M Artificial Intelligence (4)
CS 179N Graphics and Electronic Games (4)
CS 180 Introduction to Software Engineering (4)
CS 181 Principles of Programming Languages (4)
CS 182 Software Testing and Verification (4)
CS 183 UNIX System Administration (4)

Engineering

ENGR 118 Engineering Modeling and Analysis (5)
ENGR 160 Introduction to Engineering Optimization Techniques (4)

Electrical and Computer Engineering, lower division

EE 001A Engineering Circuit Analysis I (3)
EE 001B Engineering Circuit Analysis II (4)
EE 01LA Engineering Circuit Analysis I Laboratory (1)
EE 020 Linear Methods for Engineering Analysis and Design Using MATLAB (4)

Electrical and Computer Engineering, upper division

EE 100A Electronic Circuits (4)
EE 100B Electronic Circuits (4)
EE 105 Modeling and Simulation of Dynamic Systems (4).
EE 110A Signals and Systems (4)
EE 110B Signals and Systems (4)
EE 111 Digital and Analog Signals and Systems (4)
EE 114 Probability, Random Variables, and Random Processes in Electrical Engineering (4)
EE 115 Introduction to Communication Systems (4)
EE 116 Engineering Electromagnetics (4)
EE 117 Electromagnetics II (4)
EE 120A Logic Design (5)

EE 120B Introduction to Embedded Systems (4)
EE 123 Power Electronics (4)
EE 128 Data Acquisition, Instrumentation, and Process Control (4)
EE 132 Automatic Control (4)
EE 133 Solid-State Electronics (4)
EE 135 Analog Integrated Circuit Layout and Design (4)
EE 136 Semiconductor Device Processing (4)
EE 137 Introduction to Semiconductor Optoelectronic Devices (4)
EE 138 Electrical Properties of Materials (4)
EE 139 Magnetic Materials (4)
EE 141 Digital Signal Processing (4)
EE 144 Introduction to Robotics (4)
EE 145 Robotic Planning and Kinematics (4)
EE 146 Computer Vision (4)
EE 150 Digital Communications (4)
EE 151 Introduction to Digital Control (4)
EE 152 Image Processing (4)
EE 153 Electric Drives (4)
EE 155 Power System Analysis (4)
EE 162 Introduction to Nanoelectronics (4)
EE 165 Design for Reliability of Integrated Circuits and Systems (4)
EE 168 Introduction to Very Large Scale Integration (VLSI) Design (4)

Mechanical Engineering, lower division

ME 002 Introduction to Mechanical Engineering (4)
ME 018 Introduction to Engineering Computation (4)

Mechanical Engineering, upper division

ME 100A Thermodynamics (4)
ME 100B Thermodynamics (4)
ME 103 Dynamics (4)
ME 110 Mechanics of Materials (4)
ME 113 Fluid Mechanics (4)
ME 114 Introduction to Materials Science and Engineering (4)
ME 116A Heat Transfer (4)
ME 116B Heat Transfer (4)
ME 117 Combustion and Energy Systems (4)
ME 118 Mechanical Engineering Modeling and Analysis (4)
ME 120 Linear Systems and Controls (4)
ME 121 Feedback Control (4)
ME 122 Vibrations (4)
ME 130 Kinematic and Dynamic Analysis of Mechanisms (4)
ME 131 Design of Mechanisms (4)
ME 133 Introduction to Mechatronics (4)
ME 135 Transport Phenomena (4)
ME 136 Environmental Impacts of Energy Production and Conversion (4)

ME 137 Environmental Fluid Mechanics (4)
ME 138 Transport Phenomena in Living Systems (4)
ME 140 Ship Theory (4)
ME 144 Introduction to Robotics (4)
ME 145 Robotic Planning and Kinematics (4)
ME 153 Finite Element Methods (4)
ME 156 Mechanical Behavior of Materials (4)
ME 170A Experimental Techniques (4)
ME 170B Experimental Techniques (4)
ME 174 Machine Design (4)
ME 176 Sustainable Product Design (4)
ME 180 Optics and Lasers in Engineering (4)

Chemical and Environmental engineering, upper division

CEE 125 Analytical Methods for Chemical and Environmental Engineers (4)
CEE 132 Green Engineering (4)
CEE 135 Chemistry of Materials (4)
CEE 136 Aerosol Technology (4)
CEE 140A Biomaterials (4)
CEE 140B Biomaterials (4)
CEE 159 Dynamics of Biological Systems (4)
CHE 100 Engineering Thermodynamics (4)
CHE 102 Catalytic Reaction Engineering (4)
CHE 105 Introduction to Nanoscale Engineering (4)
CHE 110A Chemical Process Analysis (3)
CHE 110B Chemical Process Analysis (3)
CHE 114 Applied Fluid Mechanics (4)
CHE 116 Heat Transfer (4)
CHE 117 Separation Processes (4).
CHE 118 Process Dynamics and Control (4)
CHE 120 Mass Transfer (4)
CHE 122 Chemical Engineering Kinetics (4)
CHE 124 Biochemical Engineering Principles (4)
CHE 124L Biochemical Engineering Laboratory (2)
CHE/ENVE 130 Advanced Engineering Thermodynamics (4)
CHE 131 Electrochemical Engineering (4)
CHE 136 Advanced Topics in Heat Transfer (4)
CHE 140 Cell Engineering (4)
CHE 150 Biosensors (4)
CHE/ENVE 160A Chemical and Environmental Engineering Laboratory (3)
CHE/ENVE 160B Chemical Engineering Laboratory (3)
CHE/ENVE 160C Chemical Engineering Laboratory (3)
CHE 161 Nanotechnology Processing Laboratory (3)
CHE 171 Pollution Control for Chemical Engineers (4)
ENVE 120 Unit Operations and Processes in Environmental Engineering (4)
ENVE 121 Biological Unit Processes (4)

ENVE 133 Fundamentals of Air Pollution Engineering (4)
ENVE 134 Technology of Air Pollution Control (4)
ENVE 135 Fate and Transport of Environmental Contaminants (4)
ENVE 138 Combustion Engineering (4)
ENVE 140 Aquatic Chemistry (4)
ENVE 142 Water Quality Engineering (4)
ENVE 144 Solid Waste Management (4)
ENVE 145 Hazardous Waste Management (4)
ENVE 146 Water Quality Systems Design (4)
ENVE 171 Fundamentals of Environmental Engineering (4)

Bioengineering, lower division

BIEN 010 Overview of Bioengineering (4)

Bioengineering, upper division

BIEN 101 Quantitative Biochemistry (4)
BIEN 105 Circulation Physiology (4)
BIEN 110 Biomechanics of the Human Body (4)
BIEN 115 Quantitative Physiology (4)
BIEN 120 Biosystems and Signal Analysis (4)
BIEN 125 Biotechnology and Molecular Bioengineering (4)
BIEN 130 Bioinstrumentation (4)
BIEN 130L Bioinstrumentation Laboratory (2)
BIEN 135 Biophysics and Biothermodynamics (4)
BIEN 136 Tissue Engineering (4)
BIEN 137 Advanced Biomechanics (4)
BIEN 138 Fundamental Principles of Wound Repair (4)
BIEN 140A Biomaterials (4)
BIEN 140B Biomaterials (4)
BIEN 142 Introductory Biomedical Optical Imaging (4)
BIEN 155 Biotechnology Laboratory (2)
BIEN 159 Dynamics of Biological Systems (4)
BIEN 160 Biomedical Imaging (4)
BIEN 165 Biomolecular Engineering (4)
BIEN 166 Bioinspired Engineering for Sustainable Energy (4)
BIEN 167 Medical Diagnostics (4)