

UNIVERSITY OF THE PACIFIC ENGINEERING PHYSICS

The Bachelor of Science degree in Engineering Physics (EPHYS) is offered through the cooperation of University of the Pacific's School of Engineering and Computer Science and the Department of Physics in the College of the Pacific. Engineering physics is a field that provides broad training in physics, mathematics, and engineering design. The practitioner of engineering physics is often involved in the development of new devices and products using sophisticated physical concepts.

The engineering physics curriculum educates students to work in areas where technology is changing rapidly and where the boundaries of several traditional engineering disciplines overlap, such as sensors, robotics, materials, energy, and semiconductor materials, particularly in nano-scale electronic devices. The curriculum develops sufficient depth in both engineering and science to produce graduates who are able to relate basic knowledge to practical problems in engineering. The physics engineer is a person with the training of an applied physicist and can function as either an electrical engineer or mechanical engineer with a deeper understanding of physics applied to the two engineering disciplines.

COOPERATIVE EDUCATION PROGRAM

CO-OP coordinators work with students to arrange 7 month full-time, paid jobs with engineering employers. (CO-OP is optional for non-U.S. citizens)

GENERAL EDUCATION REQUIREMENTS

Students who enter the Engineering Physics program as freshmen are required to take Pacific Seminars 1 & 2. Students also take four General Education (GE) courses. Two GE courses are required from Category I in different areas, and one course must be from Category II-A or II-C. All students take Pacific Seminar 3 and ENGR 30, which is a required GE II-B course. Transfer students should consult the Engineering Physics Program Director about the required courses.

ENGINEERING PHYSICS PROGRAM OBJECTIVES

Through their careers in engineering or related profession, Pacific graduates are expected to demonstrate the following within a few years of earning their bachelor's degree in Engineering Physics:

- + Competency in an engineering or science profession via promotion to positions of increasing responsibility, publications, and/or conference presentations.
- + Adaptability to new developments in science and technology by successfully completing or pursuing graduate education in engineering or related fields, or participating in professional development and/or industrial training courses. Graduates of the BSEPhys degree program will be prepared to build and sustain successful careers in engineering and science and actively engage in life-long learning.

For more information, contact:

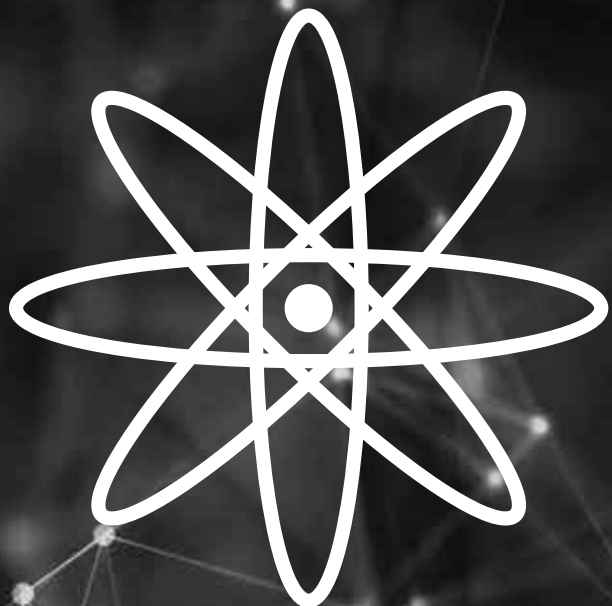
Dr. Rahim Khoie

Professor and Program Director

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Offices are located in Anderson Hall 210

pacific.edu/engineering



EPHYS

BACHELOR OF SCIENCE IN ENGINEERING PHYSICS - PROGRAM CURRICULUM

MATHEMATICS & SCIENCE CORE

MATH 051 [4] CALCULUS I
MATH 053 [4] CALCULUS II
MATH 055 [4] CALCULUS III
MATH 057 [4] DIFFERENTIAL EQUATIONS
MATH 039 [4] PROBABILITY WITH
APPLICATION TO STATISTICS
PHYS 053 [5] PHYSICS I
PHYS 055 [5] PHYSICS II
CHEM 24, 25, OR 27 [5] GENERAL CHEM.
ADVANCE MATH ELECTIVE [3 - 4] (SEE LIST BELOW)

ENGINEERING PHYSICS CORE:

COMP 051 [4] INTRO TO COMPUTER SCIENCE
↳ or ENGR 019 [3] COMPUTER APPLICATIONS IN ENGINEERING
ECPE 041 [3] CIRCUITS
ECPE 041L [1] CIRCUITS LAB
ECPE 071 [3] DIGITAL DESIGN
ECPE 071L [1] DIGITAL DESIGN LAB
ECPE 121 [4] DIGITAL SIGNAL PROCESSING
ECPE 131 [3] ELECTRONICS
ECPE 131L [1] ELECTRONICS LAB
ECPE 194 [0] CORE ASSESSMENT EXAM
ECPE 195 [2] SENIOR PROJECT 1
ECPE 196 [2] SENIOR PROJECT 2
ENGR 010 [1] DEAN'S SEMINAR
ENGR 020 [3] ENGINEERING MECHANICS

FOUR TECHNICAL ELECTIVES MUST BE CHOSEN FROM THE LIST BELOW, WITH TWO (2) COURSES IN PHYSICS,
TWO (2) IN THE SAME ENGINEERING DISCIPLINE TO FORM A COHESIVE PROGRAM.

ENGINEERING PHYSICS ELECTIVES:

PHYSICS ELECTIVES (SELECT TWO)

PHYS 127 [4] COMPUTATIONAL PHYSICS
PHYS 137 [4] MATHEMATICAL PHYSICS
PHYS 141 [4] COSMOLOGY
PHYS 151 [4] ADVANCED PHYSICS LAB
PHYS 170 [4] SOLID STATE PHYSICS
PHYS 181 [4] CLASSICAL MECHANICS
PHYS 183 [4] QUANTUM MECHANICS
PHYS 191 [3-4]* INDEPENDENT STUDY
PHYS 193 [3-4]* SPECIAL TOPICS
PHYS 197 [3-4]* UNDERGRADUATE RESEARCH

ENGINEERING ELECTIVES (SELECT TWO)

ECPE 133 [4] SOLID STATE DEVICES
ECPE 135 [4] POWER ELECTRONICS
ECPE 141 [4] ADVANCED CIRCUITS
ECPE 155 [4] AUTONOMOUS ROBOTICS
ECPE 161 [4] CONTROL SYSTEMS
ECPE 162 [4] COMMUNICATION SYSTEMS
ECPE 163 [4] ENERGY CONVERSION
ECPE 165 [3] POWER SYSTEMS
ECPE 170 [4] COMPUTER SYSTEMS & NETWORKS
ECPE 172 [4] MICROCONTROLLERS
ECPE 173 [3] COMPUTER ORGANIZATION
ECPE 174 [2] ADVANCE DIGITAL DESIGN
ECPE 177 [4] COMPUTER NETWORKING
ECPE 178 [3] COMPUTER NETWORK SECURITY
ECPE 191 [3-4]* INDEPENDENT STUDY

GENERAL EDUCATION

PACS 001 [4] PACIFIC SEMINAR 1
PACS 002 [4] PACIFIC SEMINAR 2
PACS 003 [3] PACIFIC SEMINAR 3
GEN. ED. [3-4] (I-A, I-B, OR I-C)*
GEN. ED. [3-4] (I-A, I-B, OR I-C)*
GEN. ED. [3-4] (II-A OR II-C)
ENGR 030 [3] ENGR., ETHICS & SOCIETY (II-B)
*CATEGORY I GEN. EDS MUST BE FROM DIFFERENT AREAS.

PROFESSIONAL PRACTICE (CO-OP)

ENGR 181 [16]
ENGR 182 [16]
32 UNITS OF CO-OP ARE REQUIRED TO GRADUATE,
CO-OP IS OPTIONAL FOR NON - U.S. CITIZENS.

ENGINEERING PHYSICS CORE (CONT.):

ENGR 025 [1] PROF. PRACTICE SEMINAR
ENGR 045 [4] MATERIALS SCIENCE
ENGR 120 [3] ENGINEERING MECHANICS (DYNAMICS)
PHYS 057 [4] MODERN PHYSICS
PHYS 101 [4] ELECTRICAL AND MAGNETISM
PHYS 161 [4] THERMAL PHYSICS
↳ or ENGR 122 [3] THERMO DYNAMICS
CIVL 130 [3] FLUID MECHANICS
CIVL 130L [3] FLUID MECHANICS LAB

ECPE 193 [3-4]* SPECIAL TOPICS
ECPE 197 [3-4]* UNDERGRADUATE RESEARCH
EMGT 170 [4] ENGINEERING ADMINISTRATION
EMGT 172 [3] ENGINEERING ECONOMY
EMGT 174 [3] ENGINEERING PROJECT MGT
ENGR 110 [3] INSTR. AND EXPER. METHODS
ENGR 121 [4] MECHANICS OF MATERIALS
MECH 100 [4] MANUFACTURING PROCESSES
MECH 104 [3] INTRO. TO MECHATRONICS
MECH 150 [3] HEAT TRANSFER
MECH 151 [3] APPLIED HEAT TRANSFER
MECH 155 [3] SOLAR ENERGY ENGINEERING
MECH 157 [3] THERMODYNAMICS II
MECH 158 [3] AIR CONDITIONING
MECH 160 [3] FLUID DYNAMICS
MECH 175 [4] SYST. ANALYSIS AND CONTROL
MECH 178 [3] FINITE ELEMENT METHODS

ADVANCED MATH ELECTIVES (SELECT ONE)

MATH 110 [4] NUMERICAL ANALYSIS
MATH 145 [4] APPLIED LINEAR ALGEBRA
MATH 148 [3] CRYPTOGRAPHY
MATH 153 [4] VECTOR ANALYSIS
MATH 157 [4] APPLIED DIFF. EQNS. II
MATH 174 [4] GRAPH THEORY

*INDEPENDENT STUDY, AND UNDERGRADUATE RESEARCH CAN BE TAKEN FOR 1-4 UNITS; A MINIMUM OF 3 OR MAXIMUM OF 4 UNITS CAN COUNT AS AN ELECTIVE.