

Joint Undergraduate Programs

Academic Programs

Environmental Studies – Minor
Liberal Arts and Engineering Studies – BA

BA LIBERAL ARTS and ENGINEERING STUDIES

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The BA degree program in Liberal Arts and Engineering Studies (LAES) is jointly offered by the colleges of Liberal Arts and Engineering. This program prepares students for a wide range of innovative careers in emerging professional fields that combine skills and interests in the arts, technology and culture, and also prepares them for further study in graduate school. This program is open to all students at Cal Poly. This program is not intended to be an ABET-accredited engineering program.

The curriculum allows Liberal Arts and Engineering Studies students, in collaboration with students from all other Cal Poly majors, to participate in development teams working on national and international technology and cultural projects. To further prepare students for work with diverse teams that include participants from across the globe, the program **requires strongly encourages** students to spend three to six months studying and/or working abroad. (1/8/13)

The BA in Liberal Arts and Engineering Studies leads to careers such as:

- audio technology
- digital media production and management
- digital publishing
- environmental technology education
- film and television production
- government policy making/analysis
- international technology management
- science education, such as science instrumentation and systems procurement
- sustainable community development
- technical communications
- technology services and management

Graduates of the Liberal Arts and Engineering Studies program receive a solid foundation in engineering and scientific principles, as well as a cultural appreciation that

supports them in careers requiring significant levels of technical and cultural fluency. To support these goals, the primary learning objectives are to:

- A. Think critically and creatively in the process of solving techno-social problems considering philosophical, aesthetic and expressive concerns.
- B. Communicate effectively through a variety of media in diverse, multi-cultural perspectives and facilitate communication between technical and non-technical collaborators.
- C. Use mathematics, science, and engineering principles to produce solutions to problems within the student's Liberal Arts and Engineering concentrations.
- D. Function effectively as a member of interdisciplinary and international teams, formulating sustainable solutions to problems at the intersection of technology and society.
- E. Demonstrate ethical and professional responsibilities associated with the creation, use and integration of technology.
- F. Serve as informed and responsible citizens in a global culture and remain involved with learning and helping society improve. *Objectives updated, effective (7/23/11)*

- ~~Have a working knowledge of the essential philosophical, ethical, aesthetic and expressive aspects of our culture and their historical development.~~
- ~~Communicate effectively through a variety of media in diverse, multicultural contexts.~~
- ~~Understand a technical system, component, or process.~~
- ~~Function effectively as a member of an inter-disciplinary and international team.~~
- ~~Identify technical problems and use a multidisciplinary perspective to help formulate effective solutions.~~
- ~~Possess a solid understanding of the ethical and professional responsibilities associated with the creation, use, and integration of new and existing technology.~~
- ~~Understand the social, political, and historical impact of technical solutions on complex modern problems.~~
- ~~Be able to continue asking questions and seeking interdisciplinary solutions to technological dilemmas.~~
- ~~Understand their responsibilities as informed citizens in a technological society and therefore remain engaged in helping that society improve.~~

Concentrations

LAES students must select *one* concentration from Engineering and *one* from Liberal Arts. Students may choose to follow an individualized course of study constructed in consultation with LAES advisors.

Engineering

- Computer Graphics
- Electrical Engineering (Power)
- System Design

Liberal Arts

- Culture, Society and Technology
- Interactive Communication–Cinema
- Interactive Communication–Theatre
- Publishing Technology
- Technical Communication

BA LIBERAL ARTS and ENGINEERING STUDIES

- 60 units upper division GWR
- 2.0 GPA USCP

* = Required in Major; also satisfies GE
 Note: No major, support or concentration courses may be taken as credit/no credit.

MAJOR COURSES

| | |
|-------------------------------------------------------------------------------------------|----------------|
| CHEM 124 Gen Chem for Engineering (B3/B4)* ... | 4 |
| ENGL 149 Technical Writing for Engineers (A3)* | 4 |
| LAES 301 Project-Based Learning in LAES | 4 |
| LAES 411 Collab. Global Partnerships in LAES <i>or</i> <i>LAES 302 (3/12/14)</i> | 4 |
| LAES 461 Senior Project (or other approved senior project course) | 4 |
| LAES 462 Capstone Senior Seminar in LAES | 4 |
| MATH 141, 142 Calculus I, II (B1)* | 4,4 |
| MATH 143 Calculus III (B5)* | 4 |
| MATH 241 Calculus IV | 4 |
| MATH 244 Linear Analysis I <i>or</i> advisor approved elective..... | 4 |
| PHYS 141 General Physics IA..... | 4 |
| PHYS 132, 133 General Physics II, III | 4,4 |
| STAT 312/321/350..... | 4 |
| Engineering concentration (minimum 8 units at 300-400 level)..... | 34-35 |
| Liberal Arts concentration (minimum 12 units at 300-400 level)..... | 24 |
| Study Abroad or Global Perspectives courses (300-400 level) | 4,4 |
| | 126-127 |

GENERAL EDUCATION (GE)

72 units required, 20-32 of which are specified in Major, depending on concentration.
 →See page 39 for complete GE course listing.
 →Minimum of 12 units required at the 300 level.

Area A Communication (8 units)

| | |
|-------------------------------------------------------------------|---|
| A1 Expository Writing | 4 |
| A2 Oral Communication | 4 |
| A3 Reasoning, Argumentation, and Writing * 4 units in Major | 0 |

Area B Science and Mathematics (4 units)

| | |
|----------------------------------------------------|---|
| B1 Mathematics/Statistics * 8 units in Major | 0 |
| B2 Life Science | 4 |
| B3 Physical Science * 4 units in Major | 0 |
| B4 One lab taken with either a B2 or B3 course | |
| B5 * 4 units in Major..... | 0 |

Area C Arts and Humanities (16 units)

| | |
|-------------------------------------------------------------------------|-----|
| C1 Literature | 4 |
| C2 Philosophy | 4 |
| C3 Fine/Performing Arts * may be in Liberal Arts concentration | 0-4 |
| C4 Upper-division elective * may be in Liberal Arts concentration | 0-4 |

Area D/E Society and the Individual (20 units)

| | |
|------------------------------------------|---|
| D1 The American Experience (40404) | 4 |
| D2 Political Economy | 4 |
| D3 Comparative Social Institutions | 4 |
| D4 Self Development (CSU Area E) | 4 |
| D5 Upper-division elective | 4 |

Area F Technology Elective (upper division) * may be in concentration

| | |
|-------|--------------|
| | 0-4 |
| | 40-52 |

FREE ELECTIVES..... 1-14

180

ENGINEERING CONCENTRATIONS (select one)

Computer Graphics Concentration

| | |
|----------------------------------------------------------------------|-----------|
| CSC 123 Introduction to Computing..... | 4 |
| CSC 101 Fundamentals of Computer Science I..... | 4 |
| CSC 102 Fundamentals of Computer Science II..... | 4 |
| CSC 103 Fundamentals of Computer Science III..... | 4 |
| CSC 141 Discrete Structures I <i>or</i> <i>CSC 348 (8/21/15)</i> ... | 4 |
| CSC 225 Intro to Computer Organization..... | 4 |
| CSC 357 Systems Programming | 4 |
| CSC 471 Intro to Computer Graphics | 4 |
| Computer science electives (any additional CSC course)..... | 2 |
| | 34 |

Electrical Engineering (Power) Concentration

| | |
|------------------------------------------------------|-----------|
| EE 111, 151 Intro to Electrical Engineering, Lab | 1,1 |
| EE 112 Electric Circuit Analysis I | 2 |
| EE 211, 241 Electric Circuit Analysis II, Lab | 3,1 |
| EE 212, 242 Electric Circuit Analysis III, Lab | 3,1 |
| EE 255, 295 Energy Conver Electromag, Lab | 3,1 |
| EE 335, 375 Electromagnetics, Lab | 4,1 |
| EE 406 Power Systems Analysis I | 4 |
| EE 407, 444 Power Systems Analysis II, Lab | 4,1 |
| Advisor approved power technical elective | 4 |
| | 34 |

System Design Concentration

| | |
|--------------------------------------------------|---|
| IME 101 Intro Industrial & Manuf Engr | 1 |
| IME 223 Process Improvement Fundamentals..... | 4 |
| IME 239 Industrial Costs & Controls..... | 3 |
| IME 301 Operations Research I..... | 4 |
| IME 303 Project Organization & Management..... | 4 |
| IME 314 Engineering Economics | 3 |
| IME 320 Human Factors & Tech (Area F)* | 4 |
| IME 326 Engineering Test Design & Analysis | 4 |

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|----------------------------------------------|----------|
| IME 420 Simulation | 4 |
| IME 443 Facilities Planning and Design | 4 |
| | <hr/> 35 |

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|-----------------------------------------------------------------------------------|----|
| Individualized Course of Study | 34 |
| Courses to be selected with program advisor. Minimum 8 units at 300-400 level. | |

LIBERAL ARTS CONCENTRATIONS (select one)**Culture, Society and Technology Concentration**

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|---------------------------------------------------------------------------------------------------------------------------------|----------|
| ES/WGS 350 Gender, Race, Science & Technology (Area F)* (USCP) | 4 |
| HUM 303/PHIL 341/PHIL 337 (C4)* | 4 |
| POLS 451 Technology & Public Policy | 4 |
| <i>Approved electives. Select from:</i> | 12 |
| ANT 360; COMS 317; GEOG 318, 333; HIST 354, 359; JOUR 331, 470; PHIL 322, 340; POLS 328, 333, 346, 347, 470; PSY 311, 494 | |
| | <hr/> 24 |

Interactive Communication – Cinema Concentration

| | |
|-----------------------------------------------------------------------|----------|
| TH 210 Introduction to Theatre (C3)* | 4 |
| ENGL 371 Film Styles and Genres (C4)* | 4 |
| ENGL 411 New Media Arts I..... | 4 |
| <i>Approved electives. Select from:</i> | 12 |
| ENGL 210, 370, 372, 412, 416, 419; COMS 311, 385, 419; POLS 470 | |
| | <hr/> 24 |

Interactive Communication – Theatre Concentration

| | |
|-----------------------------------------------------------------------|----------|
| TH 210 Introduction to Theatre (C3)* | 4 |
| TH 227/228 Theatre History | 4 |
| ENGL 411 New Media Arts I..... | 4 |
| <i>Approved electives. Select from:</i> | 12 |
| ENGL 210, 412; TH 220, 230/330, 310/320/360/390, 430, 434; HUM 320 | |
| | <hr/> 24 |

Publishing Technology Concentration

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|-----------------------------------------------|----------|
| GRC 101 Intro to Graphic Communication..... | 3 |
| GRC 201 Digital Publishing Systems..... | 3 |
| GRC 211 Substrates, Inks and Toners..... | 4 |
| HUM 303/PHIL 341/PHIL 337 (C4)* | 4 |
| <i>Approved electives. Select from:</i> | 10 |
| COMS 317; GRC 316, 328, 329, 402; PSY 494 | |
| | <hr/> 24 |

Technical Communication Concentration

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|-----------------------------------------------------------------|----------|
| ENGL 317 Technical Editing..... | 4 |
| ENGL 319 Information Design & Production | 4 |
| COMS 317 Technology & Human Comm | 4 |
| <i>Approved electives. Select from:</i> | 12 |
| ENGL 210, 310, 418/420; HUM 303; PHIL 337/341; COMS 213, 301 | |
| | <hr/> 24 |

Individualized Course of Study

| |
|----------------------------------------------------------------------------------------------------------------------------------------|
| 24 |
| Courses or a minor to be selected from College of Liberal Arts with program advisor approval. Minimum 12 units at 300-400 level. |

ENVIRONMENTAL STUDIES MINOR

Please see the College of Science and Mathematics for more information on this interdisciplinary minor.