Bioengineering and Business Administration

M.E.T. at a Glance: One program, two Bachelor of Science (BS) degrees

The Bioengineering and Business Administration simultaneous degree is part of the Management, Entrepreneurship, & Technology Program. The M.E.T. Program aims to educate leaders with a seamless understanding of technology innovation, from idea to real-world impact.

M.E.T. students earn two Bachelor of Science degrees in one program that combines the best of the top-ranked College of Engineering and Haas School of Business. The integrated curriculum is completed in four years. Internships, career coaching, and other enrichment activities provide ample opportunity for hands-on experience with innovation and entrepreneurship. Each M.E.T. cohort is small, allowing for close mentoring and a tight-knit community.

Admission to the M.E.T. Program

The M.E.T. Program seeks inquisitive, self-motivated students with a passion for finding and solving big problems. It is highly competitive and is open to freshmen during the UC application period (November 1 - 30). Freshman admission is limited to a maximum of 50 students. Beginning Fall 2021, current UC Berkeley students in the College of Engineering majoring in one of the M.E.T. tracks may apply to M.E.T. via the Continuing Student Admissions process.

For further information, please see the M.E.T. website (http://met.berkeley.edu).

Accreditation

All UC Berkeley Engineering programs are accredited through the Accrediting Commission for Schools, Western Association of Schools and Colleges (ACS WASC). The Undergraduate Business Degree Program is accredited by The Association to Advance Collegiate Schools of Business (AACSB).

In addition to the University, campus, and M.E.T. Program requirements, listed on the College Requirements (p. 5) tab, students must fulfill the below requirements.

General Guidelines

1. A minimum of 38 upper division business units is required.
2. Students must complete the College Requirements (p. 5) and the Major Requirements.
3. Students must complete the degree program in eight semesters, not including Summer Session.
4. All Haas business courses must be taken for a letter grade, including core substitutions, with the exception of UGBA 194 (http://guide.berkeley.edu/search/?P=UGBA%20194), UGBA 198 (http://guide.berkeley.edu/search/?P=UGBA%20198) and UGBA 199 (http://guide.berkeley.edu/search/?P=UGBA%20199) (only offered *Pass/No Pass*).
5. All technical courses that can be used to fulfill a requirement must be taken for a letter grade.
6. Students who receive a grade of D+ or lower in a core UGBA course must repeat the course until they achieve a grade of C- or better.
7. Students must complete their business prerequisite courses (including R&C) by the spring semester of their sophomore (2nd) year.
8. Two M.E.T. Special Topics courses are required. M.E.T. Special Topics courses will count as upper division business units.
9. Students in this program must adhere to all policies and procedures of the College of Engineering and the Haas School of Business.

For information regarding University and campus requirements, Reading and Composition, breadth, class schedule, minimum academic progress, and unit requirements, please see the College Requirements (p. 5).

Students are advised to consult the approved concentrations (http://bioeng.berkeley.edu/undergrad/program/concentrations/) to identify an appropriate course sequence for bioengineering specialty areas, and may also design their own program that meets the below requirements with permission from their faculty adviser. Regular consultation with an adviser is strongly encouraged. Recommended courses for each concentration can be found on the department's website (http://bioeng.berkeley.edu/undergrad/program/concentrations/).

Summary of Bioengineering Major Requirements

The requirements for the Bioengineering degree must include the following:

1. A minimum of 24 total (http://bioeng.berkeley.edu/undergrad/program/#one)[1] upper-division Bioengineering course units (including at least two bioengineering fundamentals (http://bioeng.berkeley.edu/undergrad/program/bioefundamentals/) courses, a bioengineering design (http://bioeng.berkeley.edu/undergrad/program/design/) course, and a bioengineering laboratory (http://bioeng.berkeley.edu/undergrad/program/bioelabs/) course)
2. A minimum of 36 total (http://bioeng.berkeley.edu/undergrad/program/#two)[2] upper-division units in technical topics (http://bioeng.berkeley.edu/undergrad/program/techelect/) courses
3. A minimum of 48 total units in engineering courses[2]
4. One course with a substantial ethics component (http://bioeng.berkeley.edu/undergrad/program/ethics/)
5. All courses listed on the Lower Division Requirements chart below.

[1] Not including BIO ENG 100 (http://guide.berkeley.edu/search/?P=BIO%20ENG%20100), BIO ENG 153, any other seminar-style courses or group meetings, or any course taken on a P/NP basis. Up to 4 units of letter-graded research (e.g., BIO ENG 196 (http://guide.berkeley.edu/search/?P=BIO%20ENG%20196)) can be included in the 24 units of upper-division Bioengineering courses. Up to 8 units of letter-graded research can be included in the 36 units of technical topics.

[2] Not including any course taken on a P/NP basis; courses numbered 24, 39, 84; BIO ENG 100 (http://guide.berkeley.edu/search/?P=BIO%20ENG%20100), BIO ENG 153*, BIO ENG 253*; COMPSCI 70 (http://guide.berkeley.edu/search/?P=COMPSCI%2070) (will count as Technical Topic but not as Engineering units), COMPSCI C79 (http://guide.berkeley.edu/search/?P=COMPSCI%20C79); DES INV courses (except DES INV 15 (http://guide.berkeley.edu/search/?P=DES%20INV%2015), DES INV 22 (http://guide.berkeley.edu/search/?P=DES%20INV%2022), DES INV 23, DES INV 90E (http://guide.berkeley.edu/search/?P=DES%20INV%2090E), DES INV 190E (http://guide.berkeley.edu/search/?P=DES%20INV%20190E)); ENGIN 125 (http://guide.berkeley.edu/search/?P=ENGIN%20125), ENGIN 157AC (http://guide.berkeley.edu/search/?P=ENGIN%20157AC), ENGIN 180 (http://guide.berkeley.edu/search/?P=ENGIN%20180), ENGIN 185, ENGIN 187; IND ENG 95 (http://guide.berkeley.edu/search/?P=IND%20ENG%2095), IND ENG 172 (http://guide.berkeley.edu/search/?P=IND%20ENG%20172), IND ENG 185 (http://guide.berkeley.edu/search/?P=IND%20ENG%20185), IND ENG 186 (http://guide.berkeley.edu/search/?P=IND%20ENG%20186), IND ENG 190 series, IND ENG 191 (http://guide.berkeley.edu/search/?P=IND%20ENG%20191), IND ENG 192 (http://guide.berkeley.edu/search/?P=IND%20ENG%20192), IND ENG 195 (http://guide.berkeley.edu/search/?P=IND%20ENG%20195); MEC ENG 191K (http://guide.berkeley.edu/search/?P=MEC%20ENG%20191K). Up to 8 units of letter-graded research can be applied to the 36 units of technical topics, but there is no limit to the number of letter-graded research units that can be applied to the 48 engineering units. *BIO ENG 153 and BIO ENG 253 can be applied to the 48 engineering units but not to the 36 units of technical topics.

Lower Division Requirements

UGBA 10	Principles of Business	3
ECON 1	Introduction to Economics	4
MATH 1A	Calculus	4
MATH 1B	Calculus	4
MATH 53	Multivariable Calculus	4
MATH 54	Linear Algebra and Differential Equations	4
BIO ENG 10	Introduction to Biomedicine for Engineers	4
BIO ENG 11	Engineering Molecules 1	3
BIO ENG 25	Careers in Biotechnology	1
BIO ENG 26	Introduction to Bioengineering	1
CHEM 1A & 1AL	General Chemistry and General Chemistry Laboratory	5
or CHEM 4A	General Chemistry and Quantitative Analysis	
CHEM 3A & 3AL	Chemical Structure and Reactivity and Organic Chemistry Laboratory	5
or CHEM 12A	Organic Chemistry	
PHYSICS 7A	Physics for Scientists and Engineers	4
PHYSICS 7B	Physics for Scientists and Engineers	4
ENGIN 7	Introduction to Computer Programming for Scientists and Engineers	4
or COMPSCI 61A	The Structure and Interpretation of Computer Programs	
Statistics Requirement - Complete one of the following:		4-6
COMPSCI C8 & STAT 88	Foundations of Data Science and Probability and Mathematical Statistics in Data Science	
STAT 20	Introduction to Probability and Statistics [4]	
STAT W21	Introductory Probability and Statistics for Business [4]	
STAT 134	Concepts of Probability [4]	
STAT C140	Probability for Data Science [4]	
Reading & Composition R1A & R1B		4-4

Upper Division Requirements

A total of 24 upper division Bioengineering units, including the following: [1]		24
Bioengineering Fundamentals: Choose two courses from list below.		
Bioengineering Lab Course: Choose one course from list below.		
Bioengineering Design Project or Research: Choose one course from list below.		
Technical Topics: a minimum of 36 total upper-division units from list below (includes 24 units of upper division Bioengineering courses). [1]		36
Ethics Requirement: Choose one course from list below.		3-4

[1] Not including BIO ENG 100 (http://guide.berkeley.edu/search/?P=BIO%20ENG%20100), BIO ENG 153, any other seminar-style courses or group meetings, or any course taken on a P/NP basis. Up to 4 units of letter-graded research (e.g., BIO ENG 196 (http://guide.berkeley.edu/search/?P=BIO%20ENG%20196)) can be included in the 24 units of upper-division Bioengineering courses. Up to 8 units of letter-graded research can be included in the 36 units of technical topics.

Bioengineering Fundamentals

Choose two courses from the following:

BIO ENG 101	Instrumentation in Biology and Medicine	4
BIO ENG 102	Biomechanics: Analysis and Design	4
BIO ENG 103	Engineering Molecules 2 (Students will receive no credit for BIO ENG 103 after completing CHEM 120B, or MCELLBI C100A/CHEM C130)	4
BIO ENG 104	Biological Transport Phenomena	4
BIO ENG 105	Engineering Devices 1	4
BIO ENG 110	Biomedical Physiology for Engineers	4
BIO ENG 131	Introduction to Computational Molecular and Cell Biology	4
BIO ENG 144L	Protein Informatics Laboratory	3

Bioengineering Lab

Choose one course from the following:

BIO ENG 101	Instrumentation in Biology and Medicine	4
BIO ENG 115	Tissue Engineering Lab	4
BIO ENG 121L	BioMems and BioNanotechnology Laboratory	4
BIO ENG 131	Introduction to Computational Molecular and Cell Biology	4
BIO ENG C131	Introduction to Computational Molecular and Cell Biology	4
BIO ENG C136L/ EL ENG C145O/ INTEGBI C135L	Laboratory in the Mechanics of Organisms	3
BIO ENG 140L	Synthetic Biology Laboratory	4

BIO ENG 144L	Protein Informatics Laboratory	3
BIO ENG 163L	Molecular and Cellular Biophotonics Laboratory	4
BIO ENG 168L	Practical Light Microscopy	3

Technical Topics

Choose 36 upper division units from the following:

Any Bioengineering 100-level or 200-level class [1]		3-4
CHEM 120A	Physical Chemistry	3
CHEM 120B	Physical Chemistry	3
CHEM C130/ MCELLBI C100A	Biophysical Chemistry: Physical Principles and the Molecules of Life [3]	4
CHEM 135	Chemical Biology	3
CHEM/CHM ENG C170L	Biochemical Engineering Laboratory	3
CHEM/CHM ENG C178	Polymer Science and Technology	3
CHEM/ COMPSCI/ PHYSICS C191	Quantum Information Science and Technology	3
CHM ENG 140	Introduction to Chemical Process Analysis	4
CHM ENG 141	Chemical Engineering Thermodynamics	4
CHM ENG 150A	Transport Processes	4
CHM ENG 150B	Transport and Separation Processes	4
CHM ENG 170A	Biochemical Engineering	4
CHM ENG 170B	Biochemical Engineering	4
CHM ENG/ CHEM C170L	Biochemical Engineering Laboratory	3
CHM ENG 171	Transport Phenomena	3
CHM ENG/ CHEM C178	Polymer Science and Technology	3
COMPSCI 70	Discrete Mathematics and Probability Theory [2]	4
COMPSCI C100	Principles & Techniques of Data Science	4
or STAT C100	Principles & Techniques of Data Science	
or DATA C100	Principles & Techniques of Data Science	
COMPSCI 160	User Interface Design and Development	4
COMPSCI 161	Computer Security	4
COMPSCI 169	Software Engineering	4
COMPSCI 170	Efficient Algorithms and Intractable Problems	4
COMPSCI 176	Algorithms for Computational Biology	4
COMPSCI 186	Introduction to Database Systems	4
COMPSCI 188	Introduction to Artificial Intelligence	4
COMPSCI 189	Introduction to Machine Learning	4
COMPSCI/ CHEM/PHYSICS C191	Quantum Information Science and Technology	3
EECS 127	Optimization Models in Engineering	4
EECS 149	Introduction to Embedded Systems	4
EL ENG 105	Microelectronic Devices and Circuits	4
EL ENG 117	Electromagnetic Fields and Waves	4
EL ENG 118	Introduction to Optical Engineering	4
EL ENG 120	Signals and Systems	4
EL ENG 123	Digital Signal Processing	4
EL ENG 126	Probability and Random Processes	4
EL ENG C128/ MEC ENG C134	Feedback Control Systems	4
EL ENG 142	Integrated Circuits for Communications	4
EL ENG 143	Microfabrication Technology	4
EL ENG 147	Introduction to Microelectromechanical Systems (MEMS)	3
EL ENG 192	Mechatronic Design Laboratory	4
INTEGBI 115	Introduction to Systems in Biology and Medicine	4
INTEGBI 127L	Motor Control with Laboratory	3
INTEGBI 131	General Human Anatomy	3
INTEGBI 132	Survey of Human Physiology	4
INTEGBI 135	The Mechanics of Organisms	4
INTEGBI 148	Comparative Animal Physiology	3
INTEGBI 161	Population and Evolutionary Genetics	4
INTEGBI 163	Molecular and Genomic Evolution	3
INTEGBI 164	Human Genetics and Genomics	4
IND ENG 160	Nonlinear and Discrete Optimization	3
IND ENG 162	Linear Programming and Network Flows	3
IND ENG 172	Probability and Risk Analysis for Engineers	4
MAT SCI 102	Bonding, Crystallography, and Crystal Defects	3
MAT SCI 103	Phase Transformations and Kinetics	3
MAT SCI 104	Materials Characterization	3
MAT SCI 111	Properties of Electronic Materials	4
MAT SCI 112	Corrosion (Chemical Properties)	3
MAT SCI 113	Mechanical Behavior of Engineering Materials	3
MAT SCI 130	Experimental Materials Science and Design	3
MAT SCI 151	Polymeric Materials	3
MATH 110	Linear Algebra	4
MATH 118	Fourier Analysis, Wavelets, and Signal Processing	4
MATH 127	Mathematical and Computational Methods in Molecular Biology	4
MATH 128A	Numerical Analysis	4
MATH 170	Mathematical Methods for Optimization	4
MCELLBI C100A/ CHEM C130	Biophysical Chemistry: Physical Principles and the Molecules of Life (Students should take BIO ENG 103 instead of MCELLBI C100A, credit applied for those who have already taken C100A before F17) [3]	4
MCELLBI 100B	Biochemistry: Pathways, Mechanisms, and Regulation	4
MCELLBI 102	Survey of the Principles of Biochemistry and Molecular Biology	4
MCELLBI 110	Molecular Biology: Macromolecular Synthesis and Cellular Function	4
MCELLBI/ PLANTBI C112	General Microbiology	4
MCELLBI 130	Cell and Systems Biology	4
MCELLBI 132	Biology of Human Cancer	4
MCELLBI 133L	Physiology and Cell Biology Laboratory	4
MCELLBI 136	Physiology	4
MCELLBI 140	General Genetics	4
MCELLBI 140L	Genetics Laboratory	4
MCELLBI/ PLANTBI C148	Microbial Genomics and Genetics	4

MCELLBI 150	Molecular Immunology	4
MCELLBI 160L	Neurobiology Laboratory	4
MCELLBI 166	Biophysical Neurobiology	3
MEC ENG 102B	Mechatronics Design	4
MEC ENG 104	Engineering Mechanics II	3
MEC ENG 106	Fluid Mechanics	3
MEC ENG 109	Heat Transfer	3
MEC ENG 118	Introduction to Nanotechnology and Nanoscience	3
MEC ENG 119	Introduction to MEMS (Microelectromechanical Systems)	3
MEC ENG 132	Dynamic Systems and Feedback	3
MEC ENG 133	Mechanical Vibrations	3
MEC ENG C134/ EL ENG C128	Feedback Control Systems	4
MEC ENG 167	Microscale Fluid Mechanics	3
MEC ENG 179	Augmenting Human Dexterity	4
MEC ENG 185	Introduction to Continuum Mechanics	3
NUC ENG 101	Nuclear Reactions and Radiation	4
NUC ENG 107	Introduction to Imaging	3
NUC ENG 162	Radiation Biophysics and Dosimetry	3
PHYSICS 110A	Electromagnetism and Optics	4
PHYSICS 112	Introduction to Statistical and Thermal Physics	4
PHYSICS 137A	Quantum Mechanics	4
PHYSICS 177	Principles of Molecular Biophysics	3
PHYSICS/CHEM/ COMPSCI C191	Quantum Information Science and Technology	3
PLANTBI/ MCELLBI C112	General Microbiology	4
PLANTBI/ MCELLBI C148	Microbial Genomics and Genetics	4
PLANTBI 185	Techniques in Light Microscopy	3
STAT 133	Concepts in Computing with Data	3
STAT 134	Concepts of Probability	4
STAT 135	Concepts of Statistics	4
STAT 150	Stochastic Processes	3

1 Not including BIO ENG 100, BIO ENG 153, BIO ENG 253, any other seminar-style courses or group meetings, or any course taken on a P/NP basis. Up to 4 units of letter-graded research (e.g., BIO ENG 196) can be included in the 24 units of upper-division Bioengineering courses. Up to 8 units of letter-graded research can be included in the 36 units of technical topics.

2 COMPSCI 70 will not count towards the required 48 Engineering units.

3 Students should take BIO ENG 103 instead of MCELLBI C100A. Credit applied for those who have already taken MCELLBI C100A before Fall 2017.

Bioengineering Design Project or Research

Choose one course from the following:

BIO ENG 101	Instrumentation in Biology and Medicine	4
BIO ENG 121L	BioMems and BioNanotechnology Laboratory	4
BIO ENG 140L	Synthetic Biology Laboratory	4
BIO ENG 145	Introduction to Machine Learning for Computational Biology	4
BIO ENG 168L	Practical Light Microscopy	3
BIO ENG 192	Senior Design Projects	4
BIO ENG H194	Honors Undergraduate Research	3-4
BIO ENG 196	Undergraduate Design Research	4

Ethics

All Ethics courses of 3 units or more fulfill one Humanities/Social Sciences requirement.

Choose one course from the following:

BIO ENG 100	Ethics in Science and Engineering (Recommended.)	3
ENGIN 125	Ethics, Engineering, and Society	3
ENGIN/IAS 157AC	Engineering, The Environment, and Society	4
ESPM 161	Environmental Philosophy and Ethics	4
ESPM 162	Bioethics and Society	4
HISTORY C182C/ ISF C100G/ STS C100	Introduction to Science, Technology, and Society	4
IAS/ENGIN 157AC	Engineering, The Environment, and Society	4
ISF C100G/ HISTORY C182C/ STS C100	Introduction to Science, Technology, and Society	4
L & S 160B	Effective Personal Ethics for the Twenty-First Century	3
PHILOS 104	Ethical Theories	4
PHILOS 107	Moral Psychology	4
STS C100/ HISTORY C182C/ ISF C100G	Introduction to Science, Technology, and Society	4

Upper Division Business Administration Requirements

UGBA 100	Business Communication	2
UGBA 101A	Microeconomic Analysis for Business Decisions	3
UGBA 101B	Macroeconomic Analysis for Business Decisions	3
UGBA 102A	Financial Accounting	3
UGBA 102B	Managerial Accounting	3
UGBA 103	Introduction to Finance	4
UGBA 104	Introduction to Business Analytics	3
UGBA 105	Leading People	3
UGBA 106	Marketing	3
UGBA 107	The Social, Political, and Ethical Environment of Business	3
M.E.T. Special Topics		
Two courses are required. [1]		2-2
Upper Division Business Administration Elective Courses		
Select a minimum of 4-6 units of upper division UGBA elective courses in order to complete a minimum of 38 units of upper division Business Administration courses.		4-6

UGBA 117	Special Topics in Economic Analysis and Policy [1-4]
UGBA 118	International Trade [3]
UGBA 120AA	Intermediate Financial Accounting 1 [4]
UGBA 120AB	Intermediate Financial Accounting 2 [4]
UGBA 120B	Advanced Financial Accounting [4]
UGBA 121	Federal Income Tax Accounting [4]
UGBA 122	Financial Information Analysis [4]
UGBA 123	Operating and Financial Reporting Issues in the Financial Services Industry [3]
UGBA 125	Ethics in Accounting [3]
UGBA 126	Auditing [4]
UGBA 127	Special Topics in Accounting [1-4]
UGBA 128	Strategic Cost Management [3]
UGBA 131	Corporate Finance and Financial Statement Analysis [3]
UGBA 132	Financial Institutions and Markets [3]
UGBA 133	Investments [3]
UGBA 136F	Behavioral Finance [3]
UGBA 137	Special Topics in Finance [1-4]
UGBA 141	Production and Operations Management [2-3]
UGBA 143	Game Theory and Business Decisions [3]
UGBA 147	Special Topics in Operations and Information Technology Management [1-4]
UGBA 151	Management of Human Resources [3]
UGBA 152	Negotiation and Conflict Resolution [3]
UGBA 154	Power and Politics in Organizations [2,3]
UGBA 155	Leadership [3]
UGBA 157	Special Topics in the Management of Organizations [1-4]
UGBA 160	Customer Insights [3]
UGBA 161	Market Research: Tools and Techniques for Data Collection and Analysis [3]
UGBA 162	Brand Management and Strategy [3]
UGBA 162A	Product Branding and Branded Entertainment [2]
UGBA 165	Advertising Strategy [3]
UGBA 167	Special Topics in Marketing [1-4]
UGBA 169	Pricing [3]
UGBA C172	History of American Business [3]
UGBA 173	Competitive Strategy [3]
UGBA 174	Leading Strategy Implementation [3]
UGBA 175	Legal Aspects of Management [3]
UGBA 176	Innovations in Communications and Public Relations [2]
UGBA 177	Special Topics in Business and Public Policy [1-4]
UGBA 178	Introduction to International Business [3]
UGBA 179	International Consulting for Small and Medium-Sized Enterprises [3]
UGBA 180	Introduction to Real Estate and Urban Land Economics [3]
UGBA 183	Introduction to Real Estate Finance [3]
UGBA 184	Urban and Real Estate Economics [3]
UGBA 187	Special Topics in Real Estate Economics and Finance [1-4]
UGBA 190S	Strategy for the Information Technology Firm [3]
UGBA 190T	Special Topics in Innovation and Design [1-4]
UGBA 191C	Communication for Leaders [2]
UGBA 191I	Improvisational Leadership [3]
UGBA 191P	Leadership and Personal Development [3]
UGBA 192A	Leading Nonprofit and Social Enterprises [3]
UGBA 192B	Strategic Philanthropy [2]
UGBA 192L	Applied Impact Evaluation [2]
UGBA 192N	Topics in Social Sector Leadership [1-5]
UGBA 192P	Sustainable Business Consulting Projects [3]
UGBA 192T	Topics in Responsible Business [1-4]
UGBA 193C	Practical Training [0.0]
UGBA 193B	Energy & Civilization [4]
UGBA 193I	Business Abroad [1-4]
UGBA 194	Undergraduate Colloquium on Business Topics [1]
UGBA 195A	Entrepreneurship [3]
UGBA 195P	Entrepreneurship: How to Successfully start a New Business [3]
UGBA 195S	Entrepreneurship To Address Global Poverty [3]
UGBA 195T	Topics in Entrepreneurship [1-3]
UGBA 196	Special Topics in Business Administration [1-4]
UGBA 198	Directed Study [1-4]
UGBA 199	Supervised Independent Study and Research [1-4]

[1] M.E.T. Special Topics courses will count as upper division business units.

University of California Requirements

Entry Level Writing (http://guide.berkeley.edu/undergraduate/colleges-schools/haas-business/entry-level-writing-requirement/)

All students who enter the University of California as freshmen must demonstrate their command of the English language by fulfilling the Entry Level Writing Requirement. Fulfillment of this requirement is also a prerequisite to enrollment in all reading and composition courses at UC Berkeley.

American History and American Institutions (http://guide.berkeley.edu/undergraduate/colleges-schools/haas-business/american-history-institutions-requirement/)

The American History and Institutions requirements are based on the principle that a US resident who graduates from an American university should have an understanding of the history and governmental institutions of the United States.

Campus Requirement

American Cultures (http://guide.berkeley.edu/undergraduate/colleges-schools/haas-business/american-cultures-requirement/)

American Cultures (AC) is the one requirement that all undergraduate students at UC Berkeley need to take and pass in order to graduate. The requirement offers an exciting intellectual environment centered on the study of race, ethnicity, and culture of the United States. AC courses offer students opportunities to be part of research-led, highly accomplished teaching environments, grappling with the complexity of American culture.

M.E.T. Program Requirements

Reading and Composition

Two Reading and Composition (R&C) courses must be taken for a letter grade (C- or better required), and must be completed by no later than the end of the sophomore year (4th semester of enrollment). The first half of R&C, the “A” course, must be completed by the end of the freshman year; the second half of R&C, the “B “course, by no later than the end of the sophomore year or a student's registration will be blocked. View a detailed list of courses (http://guide.berkeley.edu/undergraduate/colleges-schools/engineering/reading-composition-requirement/)that fulfill Reading and Composition requirements.

Breadth Requirement

The undergraduate breadth requirement provides Berkeley students with a rich and varied educational experience outside of their major program. As the foundation of a liberal arts education, breadth courses give students a view into the intellectual life of the University while introducing them to a multitude of perspectives and approaches to research and scholarship. Engaging students in new disciplines and with peers from other majors, the breadth experience strengthens interdisciplinary connections and context that prepare Berkeley graduates to understand and solve the complex issues of their day.

Students in the M.E.T. Program must successfully complete six breadth courses, one in each of the following categories:

Arts and Literature

Historical Studies

International Studies

Philosophy and Values (will be satisfied with UGBA 107)

Physical Science (will be satisfied with Physics 7B)

Social and Behavioral Sciences (will be satisfied with Econ 1)

- With the exception of UGBA 107, UGBA courses cannot be used to fulfill breadth requirements.
- With the exception of Econ 1 or Econ 2, microeconomics and macroeconomics at any level (Econ 3, Econ 100A/B, Econ 101A/B, IAS 106/107) cannot be used to fulfill breadth requirements.
- No more than two courses from any one department may be used to satisfy the breadth requirement (L&S Discovery courses (http://lsdiscovery.berkeley.edu) are exempt).
- Advanced Placement, International Baccalaureate and A-Level exams cannot be used to fulfill the breadth requirement.
- Courses numbered 97, 98, 99, or above 196 may not be used to complete any breadth requirement.
- Breadth courses must be a minimum of 3 semester units.
- Reading & Composition courses cannot be used to fulfill breadth requirements.

Class Schedule Requirements

- Minimum units per semester: 13
- Maximum units per semester: 20.5
- Students in the M.E.T. Program must enroll each semester in no fewer than two letter graded technical courses (of at least 3 units each, with the exception of Engineering 25, 26 and 27). Every semester they are expected to make satisfactory progress in their declared major; satisfactory progress in the student's declared major is determined by their ESS adviser.

Minimum Academic (Grade) Requirements

- A minimum overall and semester grade point average of 2.000 (C average) is required. Students will be subject to dismissal from the University if during any fall or spring semester their overall U.C. GPA falls below a 2.000, or their semester GPA is less than 2.000.
- Students must achieve a minimum GPA of 2.000 (C average) in upper division technical courses each semester. Students will be subject to dismissal from the University if their upper division technical GPA falls below 2.000.
- A minimum overall GPA of 2.000, and a minimum 2.000 GPA in upper division technical course work required of the major are required to graduate.

Unit Requirements

- A minimum of 120 units are required to graduate.
- A maximum of 16 units of Special Studies coursework (courses numbered 97, 98, 99, 197, 198, or 199) will count towards the 120 units; a maximum of four are allowed in a given semester.
- A maximum of four units of Physical Education from any school attended will count towards the 120 units.
- Passed grades may account for no more than one third of the total units completed at UC Berkeley, Fall Program for Freshmen (FPF), UC Education Abroad Program (UCEAP), or UC Berkeley Washington Program (UCDC) toward the 120 overall minimum unit requirement. Transfer credit is not factored into the limit. This includes transfer units from outside of the UC system, other UC campuses, credit-bearing exams, as well as UC Berkeley Extension XB units.

University of California Requirements

Entry Level Writing (https://www.ucop.edu/elwr/)

All students who will enter the University of California as freshmen must demonstrate their command of the English language by fulfilling the Entry Level Writing Requirement. Satisfaction of this requirement is also a prerequisite to enrollment in all Reading and Composition courses at UC Berkeley.

American History and American Institutions (http://guide.berkeley.edu/undergraduate/education/#universityrequirementstext)

The American History and Institutions requirements are based on the principle that a U.S. resident who has graduated from an American university should have an understanding of the history and governmental institutions of the United States.

Campus Requirement

American Cultures (http://guide.berkeley.edu/undergraduate/education/#campusrequirementstext)

The American Cultures requirement is a Berkeley campus requirement, one that all undergraduate students at Berkeley need to pass in order to graduate. You satisfy the requirement by passing, with a grade not lower than C- or P, an American Cultures course. You may take an American Cultures course any time during your undergraduate career at Berkeley. The requirement was instituted in 1991 to introduce students to the

diverse cultures of the United States through a comparative framework. Courses are offered in more than fifty departments in many different disciplines at both the lower and upper division level.

The American Cultures requirement and courses constitute an approach that responds directly to the problem encountered in numerous disciplines of how better to present the diversity of American experience to the diversity of American students whom we now educate.

Faculty members from many departments teach American Cultures courses, but all courses have a common framework. The courses focus on themes or issues in United States history, society, or culture; address theoretical or analytical issues relevant to understanding race, culture, and ethnicity in American society; take substantial account of groups drawn from at least three of the following: African Americans, indigenous peoples of the United States, Asian Americans, Chicano/Latino Americans, and European Americans; and are integrative and comparative in that students study each group in the larger context of American society, history, or culture.

This is not an ethnic studies requirement, nor a Third World cultures requirement, nor an adjusted Western civilization requirement. These courses focus upon how the diversity of America's constituent cultural traditions have shaped and continue to shape American identity and experience.

Visit the Class Schedule (http://classes.berkeley.edu/) or the American Cultures website (http://americancultures.berkeley.edu/) for the specific American Cultures courses offered each semester. For a complete list of approved American Cultures courses at UC Berkeley and California Community Colleges, please see the American Cultures Subcommittee's website (https://academic-senate.berkeley.edu/committees/amcult/). See your academic adviser if you have questions about your responsibility to satisfy the American Cultures breadth requirement.

Freshman

Fall Units		Spring Units	
MATH 1A[1]	4	MATH 1B[6]	4
CHEM 1A & 1AL (or CHEM 4A)[2]	5	PHYSICS 7A[7]	4
BIO ENG 10	4	UGBA 10	3
BIO ENG 26	1	Breadth - International Studies[3]	4
Reading & Composition Part A Course[5]	4	BIO ENG 25	1
M.E.T. Special Topics Course (UGBA 196)[12]	2	CHEM 3A & 3AL (or CHEM 12A)	5
	20		**21**

Sophomore

Fall Units		Spring Units	
MATH 53	4	MATH 54	4
ENGIN 7 or COMPSCI 61A	4	ECON 1 or 2 (Breadth - Social and Behavioral Sciences)[3,4]	4
PHYSICS 7B (Breadth - Physical Science)	4	Breadth - Arts & Literature/AC[3]	4
Breadth - Historical Studies/AC[3]	4	BIO ENG 11	3
Reading & Composition Part B Course[5]	4	STAT 20, 21, 134, or C140[11]	4
	20		**19**

Junior

Fall Units		Spring Units	
BIO ENG 100 (Ethics Requirement)[14]	3	BIO ENG Fundamental (varies by concentration)[8,10]	4
BIO ENG Fundamental (varies by concentration)[8,10]	4	BIO ENG Topic (varies by concentration)	4
BIO ENG Lab (varies by concentration)[8,10]	4	UGBA 107 (Breadth - Philosophy & Values)[3]	3
UGBA 100	2	UGBA 101B	3
UGBA 101A	3	UGBA 102A	3
UGBA 105	3	UGBA Elective[13]	2
	19		**19**

Senior

Fall Units		Spring Units	
UGBA 103	4	Technical Topic (must be in engineering, varies by concentration)[9,10]	4
UGBA 104	3	Technical Topic (must be in engineering, varies by concentration)	4
UGBA Elective[13]	2	Technical Topic (must be in engineering, varies by concentration)[9,10]	4
BIO ENG Design Project/Research[8,10]	4	UGBA 102B	3
BIO ENG Topic (varies by concentration)[9,10]	4	UGBA 106	3
M.E.T. Special Topics (UGBA 196)[12]	2		
	19		**18**

Total Units: 155

1 MATH 1A may be fulfilled with a score of 3, 4 or 5 on the AP Calculus AB or BC exam, a score of 5, 6 or 7 on the IB Higher Level Math exam, or a grade of A, B or C on the A-Level Math H1, H2, H3, Pure Math or Further Math exam.

2 CHEM 1A/1AL may be fulfilled with a score of 3, 4 or 5 on the AP Chemistry exam, a score of 5, 6 or 7 on the IB Higher Level Chemistry exam, or a grade of A, B or C on the A-Level Chemistry exam. CHEM 4A is intended for students majoring in chemistry or a closely-related field.

3 ECON 1 or 2 and UGBA 107 will be accepted for the Social and Behavioral Sciences and Philosophy and Values breadth requirements, respectively, as exceptions for students in the M.E.T. Program. The Biological Science breadth requirement is waived for students in the M.E.T. Program. Some American Cultures courses will also fulfill the Arts & Literature or Historical Studies breadth requirement; use Requirements filters to search the Class Schedule (http://classes.berkeley.edu/) for courses that apply. See College Requirements (p. 5) for further restrictions on breadth courses.

[4] Econ 1 may be fulfilled with scores of 4 or 5 on both the AP Microeconomics exam and AP Macroeconomics exam. However, the Social and Behavioral Sciences Breadth requirement cannot be fulfilled with AP exam scores.

[5] Reading & Composition part A may be fulfilled with a score of 4 or 5 on the AP English Language and Composition exam or the AP English Literature and Composition exam, or a score of 5, 6 or 7 on the IB Higher Level English Literature exam or the IB Higher Level English Language and Literature exam. A 5 on the AP English Literature and Composition exam, or a score of 5 or higher on the IB Higher Level English Language and Literature exam will fulfill Reading & Composition part A and part B.

[6] MATH 1B may be fulfilled with a score of 4 or 5 on the AP Calculus BC exam, a score of 5, 6 or 7 on the IB Higher Level Math exam, or a grade of A, B or C on the A-Level Math H2, H3, Pure Math or Further Math exam.

[7] PHYSICS 7A may be fulfilled with a score of 5 on the AP Physics C Mechanics exam.

[8] A minimum of 24 total (http://bioeng.berkeley.edu/undergrad/program/#one) upper-division bioengineering course units are required; including at least two bioengineering fundamentals (http://bioeng.berkeley.edu/undergrad/program/bioefundamentals/) courses, a bioengineering design (http://bioeng.berkeley.edu/undergrad/program/design/) course, and a bioengineering laboratory (http://bioeng.berkeley.edu/undergrad/program/bioelabs/) course. The upper-division bioengineering courses may NOT include BioE 100, 153, or any course taken on a P/NP basis, or seminar-style courses or group meetings. Up to 4 units of letter-graded research (e.g., BioE 196) can be included in this total.

[9] A minimum of 36 total (http://bioeng.berkeley.edu/undergrad/program/#two) upper-division units in technical topics (http://bioeng.berkeley.edu/undergrad/program/techelect/) are required. Technical topic courses may NOT include BioE 100, 153, 253, any course taken on a P/NP basis, or any seminar-style courses or group meetings. Up to 8 units of letter-graded research can be included in the 36 units of technical topics.

[10] A minimum of 48 total units in engineering courses must be completed; not including any course taken on a P/NP basis; a course that counts as M.E.T. Breadth; courses numbered 24, 39, 84; BIO ENG 100; COMPSCI 70, COMPSCI C79; DES INV courses (except DES INV 15, DES INV 22, DES INV 23, DES INV 90E, DES INV 190E); ENGIN 125, ENGIN 157AC, ENGIN 180, ENGIN 185, ENGIN 187; IND ENG 95, IND ENG 172, IND ENG 185, IND ENG 186, IND ENG 190 series, IND ENG 191, IND ENG 192, IND ENG 195; MEC ENG 191K. There is no limit to the number of letter-graded research units that can be applied to the 48 engineering units.

[11] Students can also take STAT C8 or COMPSCI C8 plus STAT 88 or UGBA 88 - Data Decisions to fulfill the statistics prerequisite. Both courses must be taken to satisfy the requirement, although they do not need to be taken in the same semester.

[12] M.E.T. Special Topics courses are required and will count as upper division business units.

[13] Students must complete a minimum of 38 units of upper division business coursework. See UGBA Elective course list under “Major Requirements” tab.

[14] Students must take one course with ethics content. This may be fulfilled within the Humanities/Social Sciences requirement by taking one of the following courses: BIO ENG 100, ENGIN 125, ENGIN 157AC/IAS 157AC, ESPM 161, ESPM 162, HISTORY C182C/ISF C100G/STS C100, L & S 160B, PHILOS 104, PHILOS 107.

Major Maps help undergraduate students discover academic, co-curricular, and discovery opportunities at UC Berkeley based on intended major or field of interest. Developed by the Division of Undergraduate Education in collaboration with academic departments, these experience maps will help you:

- **Explore** your major and gain a better understanding of your field of study
- **Connect** with people and programs that inspire and sustain your creativity, drive, curiosity and success
- **Discover** opportunities for independent inquiry, enterprise, and creative expression
- **Engage** locally and globally to broaden your perspectives and change the world
- **Reflect** on your academic career and prepare for life after Berkeley

Use the major map below as a guide to planning your undergraduate journey and designing your own unique Berkeley experience.

View the Management, Entrepreneurship, & Technology (M.E.T.) Major Map PDF. **(**https://ue.berkeley.edu/sites/default/files/management_entrepreneurship_and_technology.pdf**)**

Expand all course descriptions [+]Collapse all course descriptions [-]

UGBA C5 Introduction to Entrepreneurship 2 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019, Fall 2018
This course offers students a taste of what it’s really like to start a business. In addition to learning key foundational entrepreneurial concepts such as idea generation & evaluation, customer & product development, creating a business model, fundraising, marketing, and scaling & exiting a business, students will also hear from successful entrepreneurs who share their perspectives and best practices. Students will apply core concepts by working in teams to evaluate and select a venture idea that they will then develop throughout the semester.
Introduction to Entrepreneurship: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Also listed as: L & S C5

Introduction to Entrepreneurship: Read Less [-]

BIO ENG 10 Introduction to Biomedicine for Engineers 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
This course is intended for lower division students interested in acquiring a foundation in biomedicine with topics ranging from evolutionary biology to human physiology. The emphasis is on the integration of engineering applications to biology and health. The specific lecture topics and exercises will include the key aspects of genomics and proteomics as well as topics on plant and animal evolution, stem cell biomedicine, and tissue regeneration and replacement. Medical physiology topics include relevant engineering aspects of human brain, heart, musculoskeletal, and other systems.
Introduction to Biomedicine for Engineers: Read More [+]
Objectives & Outcomes

Student Learning Outcomes: The goal is for undergraduate engineering students to gain sufficient biology and human physiology fundamentals so that they are better prepared to study specialized topics, e.g., biomechanics, imaging, computational biology, tissue engineering, biomonitoring, drug development, robotics, and other topics covered by upper division and graduate courses in UC Berkeley departments of Molecular and Cell Biology, Integrative Biology, Bioengineering, Electrical Engineering and Computer Science, Mechanical Engineering, and courses in the UC San Francisco Division of Bioengineering.

Rules & Requirements

Prerequisites: MATH 1A or MATH 16A or another introductory calculus course (can be taken concurrently)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Conboy, Kumar, Johnson

Introduction to Biomedicine for Engineers: Read Less [-]

UGBA 10 Principles of Business 3 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
This team-taught course provides an introduction to the study of the modern business enterprise. It consists of four modules, the order of which may vary from semester to semester, and an online business simulation that runs during most of the semester. The four modules cover: Finance & Accounting, Marketing, Operations & Sustainability, and Leadership. In addition to lectures and the simulation, students attend discussion section each week.
Principles of Business: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Formerly known as: Business Administration 10

Principles of Business: Read Less [-]

BIO ENG 11 Engineering Molecules 1 3 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
This course focuses on providing students with a foundation in organic chemistry and biochemistry needed to understand contemporary problems in synthetic biology, biomaterials and computational biology.
Engineering Molecules 1: Read More [+]
Objectives & Outcomes

Course Objectives: The goal of this course is to give students the background in organic chemistry and biochemistry needed understand problems in synthetic biology, biomaterials and molecular imaging. Emphasis is on basic mechanisms

Student Learning Outcomes: Students will learn aspects of organic and biochemistry required to begin the rational manipulation and/or design of biological systems and the molecules they are comprised of.

Rules & Requirements

Prerequisites: CHEM 3A

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Engineering Molecules 1: Read Less [-]

UGBA C12 The Berkeley Changemaker 2 Units

Terms offered: Summer 2022 Second 6 Week Session, Spring 2022, Summer 2021 Second 6 Week Session, Spring 2021
Berkeley Changemaker impact occurs across many fronts: scientific, artistic, social, and entrepreneurial. This course helps students identify as a Berkeley Changemaker and learn the critical thinking, communication, and collaboration skills to become one. Combining disciplines across UC Berkeley, the course also helps launch the Berkeley Discovery arc. Students develop their own leadership styles and discover how they can create and lead diverse teams to act upon the world. Values in Berkeley's DNA like Questioning the Status Quo and going Beyond Yourself support students in leading from whatever position they occupy, preparing them to leave their mark on campus, in their communities, or beyond. More at: http://changemaker.berkeley.edu.
The Berkeley Changemaker: Read More [+]
Hours & Format

Fall and/or spring: 8 weeks - 4 hours of web-based lecture per week

Summer:
3 weeks - 10 hours of web-based lecture per week
6 weeks - 5 hours of web-based lecture per week
8 weeks - 4 hours of web-based lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Alternative to final exam.

Also listed as: L & S C12

The Berkeley Changemaker: Read Less [-]

BIO ENG 24 Freshmen Seminar 1 Unit

Terms offered: Spring 2022, Spring 2021, Fall 2020
The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley seminars are offered in all campus departments, and topics vary from department to department and semester to semester.
Freshmen Seminar: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final Exam To be decided by the instructor when the class is offered.

Freshmen Seminar: Read Less [-]

UGBA 24 Freshman Seminars 1 Unit

Terms offered: Spring 2022, Spring 2021, Spring 2020
The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester.
Freshman Seminars: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

Freshman Seminars: Read Less [-]

BIO ENG 25 Careers in Biotechnology 1 Unit

Terms offered: Spring 2022, Spring 2021, Spring 2020
This introductory seminar is designed to give freshmen and sophomores an opportunity to explore specialties related to engineering in the pharmaceutical/biotech field. A series of one-hour seminars will be presented by industry professionals, professors, and researchers. Topics may include biotechnology and pharmaceutical manufacturing; process and control engineering; drug inspection process; research and development; compliance and validation; construction process for a GMP facility; project management; and engineered solutions to environmental challenges. This course is of interest to students in all areas of engineering and biology, including industrial engineering and manufacturing, chemical engineering, and bioengineering.
Careers in Biotechnology: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Careers in Biotechnology: Read Less [-]

BIO ENG 26 Introduction to Bioengineering 1 Unit

Terms offered: Fall 2021, Fall 2020, Fall 2019
This introductory seminar is designed to give freshmen and sophomores a glimpse of a broad selection of bioengineering research that is currently underway at Berkeley and UCSF. Students will become familiar with bioengineering applications in the various concentration areas and see how engineering principles can be applied to biological and medical problems.
Introduction to Bioengineering: Read More [+]
Objectives & Outcomes

Course Objectives: This course is designed to expose students to current research and problems in bioengineering. As a freshman/ sophomore class, its main purpose is to excite our students about the possibilities of bioengineering and to help them to choose an area of focus.

Student Learning Outcomes: This course demonstrates the rapid pace of new technology and the need for life-long learning (2). In addition, the course, because of its state-of-the-art research content, encourages our students to explore new horizons (3).

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Instructors: T. Johnson, H. Lam

Introduction to Bioengineering: Read Less [-]

UGBA 39AC Philanthropy: A Cross-Cultural Perspective 3 Units

Terms offered: Fall 2021, Fall 2019, Fall 2018
This class will compare and contrast the variety of gift giving and sharing traditions that make up American philanthropy. Both the cultural antecedents and their expression in this country will be explored from five ethnic and racial groups: Native American, European American, African American, Hispanic American, and Asian American. The goal is to gain a greater understanding of the many dimensions of philanthropy as it is practiced in the United States today.
Philanthropy: A Cross-Cultural Perspective: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 39AC

Philanthropy: A Cross-Cultural Perspective: Read Less [-]

UGBA 39E Freshman/Sophomore Seminar 2 - 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester.
Freshman/Sophomore Seminar: Read More [+]
Rules & Requirements

Prerequisites: Priority given to freshmen and sophomores

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 2-4 hours of seminar per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

Formerly known as: Business Administration 39

Freshman/Sophomore Seminar: Read Less [-]

BIO ENG 84 Sophomore Seminar 1 or 2 Units

Terms offered: Spring 2018, Spring 2017, Spring 2013
Sophomore seminars are small interactive courses offered by faculty members in departments all across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores.
Sophomore Seminar: Read More [+]
Rules & Requirements

Prerequisites: At discretion of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring:
5 weeks - 3-6 hours of seminar per week
10 weeks - 1.5-3 hours of seminar per week
15 weeks - 1-2 hours of seminar per week

Summer:
6 weeks - 2.5-5 hours of seminar per week
8 weeks - 1.5-3.5 hours of seminar and 2-4 hours of seminar per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

Sophomore Seminar: Read Less [-]

UGBA 88 Data and Decisions 2 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
The goal of this connector course is to provide an understanding of how data and statistical analysis can improve managerial decision-making. We will explore statistical methods for gleaning insights from economic and social data, with an emphasis on approaches to identifying causal relationships. We will discuss how to design and analyze randomized experiments and introduce econometric methods for estimating causal effects in non-experimental data. The course draws on a variety of business and social science applications, including advertising, management, online marketplaces, labor markets, and education. This course, in combination with the Data 8 Foundations course, satisfies the statistics prerequisite for admission to Haas.
Data and Decisions: Read More [+]
Rules & Requirements

Prerequisites: One semester of Calculus (Math 16A or Math 1A). Also, this is a Data Science connector course and may only be taken concurrently with or after completing Computer Science C8/Statistics C8/ Information C8

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Miller

Data and Decisions: Read Less [-]

UGBA C95B Introduction to the Biotechnology Field and Industry 2 Units

Terms offered: Spring 2019
This course offers an introduction to the field of biotechnology and will cover the history of the field, its impact on medicine and society, key methodologies, important therapeutic areas, and the range of career options available in the biopharmaceutical industry. In addition to lectures on innovation and entrepreneurship, students will hear from lecturers with expertise ranging from molecular biology to clinical trial design and interpretation. Several case studies of historically impactful scientists, entrepreneurs, and biotherapeutic companies will be presented. Students will work in teams to create and develop novel biotechnology company ideas to present in class. Intended for students interested in the Biology +Business program.
Introduction to the Biotechnology Field and Industry: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Alternative to final exam.

Instructors: Kirn, Lasky

Formerly known as: Molecular and Cell Biology C95B/Undergrad. Business Administration C95B

Also listed as: MCELLBI C75

Introduction to the Biotechnology Field and Industry: Read Less [-]

UGBA 96 Lower Division Special Topics in Business Administration 1 - 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
Study in various fields of business administration for lower division students. Topics will vary from year to year and will be announced at the beginning of each semester.
Lower Division Special Topics in Business Administration: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer: 6 weeks - 2.5-10 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Lower Division Special Topics in Business Administration: Read Less [-]

BIO ENG 98 Supervised Independent Group Studies 1 - 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020
Organized group study on various topics under the sponsorship of a member of the Bioengineering faculty.
Supervised Independent Group Studies: Read More [+]
Rules & Requirements

Prerequisites: Consent of instructor

Credit Restrictions: Enrollment is restricted; see the Introduction to Courses and Curricul a section of this catalog.

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of directed group study per week

Summer: 8 weeks - 1-4 hours of directed group study per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Supervised Independent Group Studies: Read Less [-]

UGBA 98 Directed Group Study 1 - 4 Units

Terms offered: Spring 2015, Fall 2014, Spring 2014
Organized group study on topics selected by lower division students under the sponsorship and direction of a member of the Haas School of Business faculty.
Directed Group Study: Read More [+]
Rules & Requirements

Credit Restrictions: Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog.

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of directed group study per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Formerly known as: Business Administration 98

Directed Group Study: Read Less [-]

BIO ENG 99 Supervised Independent Study and Research 1 - 4 Units

Terms offered: Spring 2020, Fall 2019, Spring 2019
Supervised independent study for lower division students.
Supervised Independent Study and Research: Read More [+]
Rules & Requirements

Prerequisites: Freshman or sophomore standing and consent of instructor

Credit Restrictions: Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog.

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of independent study per week

Summer:
8 weeks - 1.5-7.5 hours of independent study per week
10 weeks - 1.5-6 hours of independent study per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Supervised Independent Study and Research: Read Less [-]

BIO ENG 100 Ethics in Science and Engineering 3 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
The goal of this semester course is to present the issues of professional conduct in the practice of engineering, research, publication, public and private disclosures, and in managing professional and financial conflicts. The method is through historical didactic presentations, case studies, presentations of methods for problem solving in ethical matters, and classroom debates on contemporary ethical issues. The faculty will be drawn from national experts and faculty from religious studies, journalism, and law from the UC Berkeley campus.
Ethics in Science and Engineering: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Lam, Hayley

Ethics in Science and Engineering: Read Less [-]

UGBA 100 Business Communication 2 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
Theory and practice of effective communication in a business environment. Students practice what they learn with oral presentations and written assignments that model real-life business situations.
Business Communication: Read More [+]

Rules & Requirements

Prerequisites: Restricted to Undergraduate Business Administration Majors Only

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Summer:
6 weeks - 5 hours of lecture per week
8 weeks - 4 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Business Communication: Read Less [-]

BIO ENG 101 Instrumentation in Biology and Medicine 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
This course teaches the fundamental principles underlying modern sensing and control instrumentation used in biology and medicine. The course takes an integrative analytic and hands-on approach to measurement theory and practice by presenting and analyzing example instruments currently used for biology and medical research, including EEG, ECG, pulsed oximeters, Complete Blood Count (CBC), etc.
Instrumentation in Biology and Medicine: Read More [+]

Objectives & Outcomes

Course Objectives: Students should understand the architecture and design principles of modern biomedical sensor data-acquisition (sensor-DAQ) systems. They should understand how to choose the appropriate biomedical sensor, instrumentation amplifier, number of bits, sampling rate, anti-aliasing filter, and DAQ system. They will learn how to design a low-noise instrumentation amplifier circuit. They should understand the crucial importance of suppressing 60 Hz and other interferences to acquire high quality low-level biomedical signals. They should understand the design principles of building, debugging.

Student Learning Outcomes: Students will achieve knowledge and skills in biomedical signal acquisition. They will be assessed in their success with the Course Objectives through tests, homeworks, and laboratories. In particular, the tests will ensure that the students have absorbed the theoretical concepts. The laboratories will provide assessment of learning practical skills (e.g., building an ECG circuit).

Rules & Requirements

Prerequisites: EECS 16A, EECS 16B, MATH 53, MATH 54, PHYSICS 7A, and PHYSICS 7B; or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Conolly

Instrumentation in Biology and Medicine: Read Less [-]

UGBA 101A Microeconomic Analysis for Business Decisions 3 Units

Terms offered: Summer 2022 First 6 Week Session, Spring 2022, Fall 2021

Economic analysis applicable to the problems of business enterprises with emphasis on the determination of the level of prices, outputs, and inputs; effects of the state of the competitive environment on business and government policies.

Microeconomic Analysis for Business Decisions: Read More [+]

Rules & Requirements

Prerequisites: Economics 1, Mathematics 1A or 16A, Statistics W21, or equivalents

Credit Restrictions: Students will receive no credit for UGBA 101A after completing ECON 100A, ECON 101A, BUS ADM 110, ENVECON 100, BUS ADM S110, IAS 106, or POLECON 106. A deficient grade in UGBA 101A may be removed by taking POLECON 106, ECON 100A, ECON 101A, ENVECON 100, IAS 106, or POLECON 106.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1.5 hours of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 2.5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Microeconomic Analysis for Business Decisions: Read Less [-]

UGBA 101B Macroeconomic Analysis for Business Decisions 3 Units

Terms offered: Summer 2022 First 6 Week Session, Summer 2022 Second 6 Week Session, Spring 2022

Analysis of the operation of the market system with emphasis on the factors responsible for economic instability; analysis of public and business policies which are necessary as a result of business fluctuations.

Macroeconomic Analysis for Business Decisions: Read More [+]

Rules & Requirements

Prerequisites: Economics 1, Mathematics 1A or 16A, Statistics W21, or equivalents

Credit Restrictions: Students will receive no credit for UGBA 101B after completing ECON 100B, ECON 101B, BUS ADM 111, IAS 107, or POLECON 107. A deficient grade in UGBA 101B may be removed by taking ECON 100B, ECON 101B, IAS 107, or POLECON 107.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 2.5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required, with common exam group.

Formerly known as: Business Administration 111

Macroeconomic Analysis for Business Decisions: Read Less [-]

BIO ENG 102 Biomechanics: Analysis and Design 4 Units

Terms offered: Spring 2022, Fall 2020, Fall 2019
This course introduces, develops and applies the methods of continuum mechanics to biomechanical phenomena abundant in biology and medicine. It is intended for upper level undergraduate students who have been exposed to vectors, differential equations, and undergraduate course(s) in physics and certain aspects of modern biology.
Biomechanics: Analysis and Design: Read More [+]
Objectives & Outcomes

Course Objectives: This course introduces, develops and applies scaling laws and the methods of continuum mechanics to biomechanical phenomena related to tissue or organ levels. It is intended for upper level undergraduate students who have been exposed to vectors, differential equations, and undergraduate course(s) in physics and certain aspects of modern biology.
Topics include:

- Biosolid mechanics
- Stress, strain, constitutive equation
- Vector and tensor math
- Equilibrium
- Extension, torsion, bending, buckling
- Material properties of tissues

Student Learning Outcomes: The course will equip the students with a deep understanding of principles of biomechanics. The intuitions gained in this course will help guide the analysis of design of biomedical devices and help the understanding of biological/medical phenomena in health and disease.
The students will develop insight, skills and tools in quantitative analysis of diverse biomechanical systems and topics, spanning various scales from cellular to tissue and organ levels.

Rules & Requirements

Prerequisites: MATH 53, MATH 54, and PHYSICS 7A

Credit Restrictions: Students will receive no credit for BIO ENG 102 after completing MEC ENG C85.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Mofrad

Biomechanics: Analysis and Design: Read Less [-]

UGBA 102A Financial Accounting 3 Units

Terms offered: Summer 2022 First 6 Week Session, Spring 2022, Fall 2021
The identification, measurement, and reporting of financial effects of events on enterprises, with a particular emphasis on business organization. Preparation and interpretation of balance sheets, income statements, and statements of cash flows.
Financial Accounting: Read More [+]
Rules & Requirements

Credit Restrictions: Course not open for credit for students who are taking or have completed Undergraduate Business Administration W102A.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 2.5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Financial Accounting: Read Less [-]

UGBA 102B Managerial Accounting 3 Units

Terms offered: Summer 2022 Second 6 Week Session, Spring 2022, Fall 2021
The uses of accounting systems and their outputs in the process of management of an enterprise. Classification of costs and revenue on several bases for various uses; budgeting and standard cost accounting; analyses of relevant costs and other data for decision making.
Managerial Accounting: Read More [+]
Rules & Requirements

Prerequisites: 102A

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 2.5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Managerial Accounting: Read Less [-]

UGBA W102A Financial Accounting 3 Units

Terms offered: Summer 2022 First 6 Week Session, Summer 2021 First 6 Week Session, Summer 2020 First 6 Week Session
The identification, measurement, and reporting of financial effects of events on enterprises, with a particular emphasis on business organization. Preparation and interpretation of balance sheets, income statements, and statements of cash flows.
Financial Accounting: Read More [+]
Rules & Requirements

Credit Restrictions: Course not open for credit for students who are taking or have completed Undergraduate Business Administration 102A.

Hours & Format

Summer: 6 weeks - 7.5 hours of web-based lecture per week

Online: This is an online course.

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Financial Accounting: Read Less [-]

BIO ENG 103 Engineering Molecules 2 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
Thermodynamic and kinetic concepts applied to understanding the chemistry and structure of biomolecules (proteins, membranes, DNA, and RNA) and their thermodynamic and kinetic features in the crowded cellular environment. Topics include entropy, bioenergetics, free energy, chemical potential, reaction kinetics, enzyme kinetics, diffusion and transport, non-equilibrium systems, and their connections to the cellular environment.
Engineering Molecules 2: Read More [+]
Objectives & Outcomes

Course Objectives: (1) To introduce the basics of thermodynamics and chemical kinetics for molecular to cellular biological systems; (2) To give students an understanding of biological size and timescales illustrated through computational exercises on model problems in physical biology.

Student Learning Outcomes: students will be able to (1) relate statistical thermodynamics and chemical kinetics to analyze molecular and cellular behavior beyond the ideal gas and Carnot cycle.

Rules & Requirements

Prerequisites: PHYSICS 7A, PHYSICS 7B, MATH 1A, MATH 1B, MATH 53, and MATH 54; and BIOLOGY 1A or BIO ENG 11

Credit Restrictions: Students will receive no credit for Bioengineering 103 after completing Chemistry 120B, or Molecular Cell Biology C100A/ Chemistry C130.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Head-Gordon

Engineering Molecules 2: Read Less [-]

UGBA 103 Introduction to Finance 4 Units

Terms offered: Summer 2022 First 6 Week Session, Summer 2022 Second 6 Week Session, Spring 2022
Analysis and management of the flow of funds through an enterprise. Cash management, source and application of funds, term loans, types and sources of long-term capital. Capital budgeting, cost of capital, and financial structure. Introduction to capital markets.
Introduction to Finance: Read More [+]

Rules & Requirements

Prerequisites: 101A

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1.5 hours of discussion per week

Summer:
6 weeks - 7.5 hours of lecture and 2.5 hours of discussion per week
8 weeks - 6 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Introduction to Finance: Read Less [-]

BIO ENG 104 Biological Transport Phenomena 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
The transport of mass, momentum, and energy are critical to the function of living systems and the design of medical devices. Biological transport phenomena are present at a wide range of length scales: molecular, cellular, organ (whole and by functional unit), and organism. This course develops and applies scaling laws and the methods of continuum mechanics to biological transport phenomena over a range of length and time scales. The course is intended for undergraduate students who have taken a course in differential equations and an introductory course in physics. Students should be familiar with basic biology; an understanding of physiology is useful, but not assumed.
Biological Transport Phenomena: Read More [+]

Rules & Requirements

Prerequisites: MATH 53, MATH 54, and PHYSICS 7A

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Johnson

Biological Transport Phenomena: Read Less [-]

UGBA 104 Introduction to Business Analytics 3 Units

Terms offered: Summer 2022 First 6 Week Session, Spring 2022, Fall 2021
This course provides an introduction to several quantitative methods used to facilitate complex decision-making in business, with applications in many different industries, at different levels in the organization, and with different scopes of decisions. The power of the methods covered in this class is further enhanced by implementing them in spreadsheet software, which allows complex problems to be approached and solved in a straightforward and understandable manner.
Introduction to Business Analytics: Read More [+]

Rules & Requirements

Prerequisites: Mathematics 1B or 16B, Statistics W21, or equivalents

Hours & Format

Fall and/or spring: 15 weeks - 1.5 hours of lecture and 1.5 hours of laboratory per week

Summer: 6 weeks - 2.5 hours of lecture and 2.5 hours of laboratory per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Introduction to Business Analytics: Read Less [-]

BIO ENG 105 Engineering Devices 1 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
This course provides students with an introduction to medical device design through fundamentals of circuit design/analysis, signal processing, and instrumentation development from concept to market. Important concepts will include impulse responses of systems, op-amps, interference, and noise; the origin of biological signals and recording mechanisms; and design considerations including sensitivity, accuracy, and market potential. This course is designed to be an introduction to these tools and concepts to prepare students to engage deeply and mindfully with device design in their future courses
Engineering Devices 1: Read More [+]
Objectives & Outcomes

Course Objectives: # To prepare students to engage in upper division device design work
Establish a foundational understanding of biomedical device electronics, signal acquisition, sampling, and reconstruction
To learn quantitative approaches to analyze biomedical signals
Reinforce mathematical principles including linear algebra, differential equations
Establish proficiency in the use of MATLAB as a tool for analyzing biomedical data

Student Learning Outcomes: To give students the mathematical and physical tools required to engage in device design.

Rules & Requirements

Prerequisites: MATH 53, PHYSICS 7A, and PHYSICS 7B

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Moriel Vandsburger

Engineering Devices 1: Read Less [-]

UGBA 105 Leading People 3 Units

Terms offered: Summer 2022 First 6 Week Session, Spring 2022, Fall 2021
A general descriptive and analytical study of organizations from the behavioral science point of view. Problems of motivation, leadership, morale, social structure, groups, communications, hierarchy, and control in complex organizations are addressed. The interaction among technology, environment, and human behavior are considered. Alternate theoretical models are discussed.
Leading People: Read More [+]
Rules & Requirements

Credit Restrictions: Students will receive no credit for Undergrad. Business Administration 105 after completing Business Administration 150 or S150.

Hours & Format

Fall and/or spring: 15 weeks - 1.5-3 hours of lecture and 1.5-0 hours of discussion per week

Summer:
6 weeks - 4-8 hours of lecture and 4-0 hours of discussion per week
8 weeks - 3-6 hours of lecture and 3-0 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Leading People: Read Less [-]

UGBA 106 Marketing 3 Units

Terms offered: Summer 2022 First 6 Week Session, Summer 2022 Second 6 Week Session, Spring 2022
The evolution of markets and marketing; market structure; marketing cost and efficiency; public and private regulation; the development of marketing programs including decisions involving products, price, promotional distribution.
Marketing: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer:
6 weeks - 7.5 hours of lecture per week
8 weeks - 6 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Marketing: Read Less [-]

BIO ENG C106A Introduction to Robotics 4 Units

Terms offered: Fall 2021, Fall 2020, Spring 2020, Fall 2019
This course is an introduction to the field of robotics. It covers the fundamentals of kinematics, dynamics, control of robot manipulators, robotic vision, sensing, forward & inverse kinematics of serial chain manipulators, the manipulator Jacobian, force relations, dynamics, & control. We will present techniques for geometric motion planning & obstacle avoidance. Open problems in trajectory generation with dynamic constraints will also be discussed. The course also presents the use of the same analytical techniques as manipulation for the analysis of images & computer vision. Low level vision, structure from motion, & an introduction to vision & learning will be covered. The course concludes with current applications of robotics.
Introduction to Robotics: Read More [+]

Rules & Requirements

Prerequisites: Familiarity with linear algebra at the level of EECS 16A/ EECS 16B or Math 54. Experience coding in python at the level of COMPSCI 61A. Preferred: experience developing software at the level of COMPSCI 61B and experience using Linux

Credit Restrictions: Students will receive no credit for Electrical Engineering and Computer Science C106A/Bioengineering C106A after completing EE C106A/BioE C125, Electrical Engineering 206A, or Electrical Engineering and Computer Science 206A.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture, 1 hour of discussion, and 3 hours of laboratory per week

Summer: 8 weeks - 6 hours of lecture, 2 hours of discussion, and 6 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Sastry

Also listed as: EECS C106A/MEC ENG C106A

Introduction to Robotics: Read Less [-]

BIO ENG C106B Robotic Manipulation and Interaction 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020, Spring 2019
The course is a sequel to EECS/BIOE/MEC106A/EECSC206A, which covers the mathematical fundamentals of robotics including kinematics, dynamics and control as well as an introduction to path planning, obstacle avoidance, and computer vision. This course will present several areas of robotics and active vision, at a deeper level and informed by current research. Concepts will include the review at an advanced level of robot control, the kinematics, dynamics and control of multi-fingered hands, grasping and manipulation of objects, mobile robots: including non-holonomic motion planning and control, path planning, Simultaneous Localization And Mapping (SLAM), and active vision. Additional research topics covered at the instructor's discretion.
Robotic Manipulation and Interaction: Read More [+]

Rules & Requirements

Prerequisites: EECS C106A / BIO ENG C106A / MEC ENG C106A / EECS C206A or an equivalent course. A strong programming background, knowledge of Python and Matlab, and some coursework in feedback controls (such as EL ENG C128 / MEC ENG C134) are also useful. Students who have not taken the prerequisite course should have a strong programming background, knowledge of Python and Matlab, and exposure to linear algebra, Lagrangian dynamics, and feedback controls at the intermediate level. EECS C106A

Credit Restrictions: Students will receive no credit for Electrical Engineering and Computer Science C106B/Bioengineering C106B after completing Electrical Engineering C106B/Bioengineering C125B, Electrical Engineering 206B, or Electrical Engineering and Computer Science 206B.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture, 1 hour of discussion, and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Sastry

Also listed as: EECS C106B/MEC ENG C106B

Robotic Manipulation and Interaction: Read Less [-]

UGBA 107 The Social, Political, and Ethical Environment of Business 3 Units

Terms offered: Summer 2022 First 6 Week Session, Spring 2022, Fall 2021
Study and analysis of American business in a changing social and political environment. Interaction between business and other institutions. Role of business in the development of social values, goals, and national priorities. The expanding role of the corporation in dealing with social problems and issues.
The Social, Political, and Ethical Environment of Business: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 6 weeks - 5-7.5 hours of lecture and 2.5-0 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

The Social, Political, and Ethical Environment of Business: Read Less [-]

BIO ENG 110 Biomedical Physiology for Engineers 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
This course introduces students to the physiology of human organ systems, with an emphasis on quantitative problem solving, engineering-style modeling, and applications to clinical medicine.
Biomedical Physiology for Engineers: Read More [+]
Objectives & Outcomes

Course Objectives: This 15-week course will introduce students to the principles of medical physiology, with a strong emphasis on quantitative problem solving, the physiological basis of human disease, and applications to biomedical devices and prostheses.

Student Learning Outcomes: Students will be exposed to the basic physiological systems which govern the function of each organ system, examples of diseases in which these systems go awry, and medical devices which have been developed to correct the deficits.

Rules & Requirements

Prerequisites: BIO ENG 10; and BIO ENG 11 or BIOLOGY 1A; and MATH 54 recommended

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Kumar

Biomedical Physiology for Engineers: Read Less [-]

BIO ENG 111 Functional Biomaterials Development and Characterization 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
This course is intended for upper level engineering undergraduate students interested in the development of novel functional proteins and peptide motifs and characterization of their physical and biological properties using various instrumentation tools in quantitative manners. The emphasis of the class is how to develop novel proteins and peptide motifs, and to characterize their physical and biological functions using various analytical tools in quantitative manners.
Functional Biomaterials Development and Characterization: Read More [+]
Objectives & Outcomes

Course Objectives: To provide students with basic and extended concepts for the development of the functional proteins and their characterization for various bioengineering and biomedical purposes.

Student Learning Outcomes: Upon completing the course, the student should be able:
1.
To understand the directed evolution processes of functional proteins.
2.
To identify the natural protein products from proteomic database.
3.
To design various experiments to characterize the new protein products.
4.
To develop novel functional proteins and characterize their properties.
5.
To understand basic concepts and instrumentation of protein characterization tools.

Rules & Requirements

Prerequisites: CHEM 1A or CHEM 4A; BIO ENG 11 or BIOLOGY 1A; and BIO ENG 103

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: SW Lee

Functional Biomaterials Development and Characterization: Read Less [-]

BIO ENG C112 Molecular Biomechanics and Mechanobiology of the Cell 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
This course applies methods of statistical continuum mechanics to subcellar biomechanical phenomena ranging from nanoscale (molecular) to microscale (whole cell and cell population) biological processes at the interface of mechanics, biology, and chemistry.
Molecular Biomechanics and Mechanobiology of the Cell: Read More [+]
Objectives & Outcomes

Course Objectives: This course, which is open to senior undergraduate students or graduate students in diverse disciplines ranging from engineering to biology to chemistry and physics, is aimed at exposing students to subcellular biomechanical phenomena spanning scales from molecules to the whole cell.

Student Learning Outcomes: The students will develop tools and skills to (1) understand and analyze subcelluar biomechanics and transport phenomena, and (2) ultimately apply these skills to novel biological and biomedical applications

Rules & Requirements

Prerequisites: BIO ENG 102; or MEC ENG C85 / CIV ENG C30; or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Mofrad

Also listed as: MEC ENG C115

Molecular Biomechanics and Mechanobiology of the Cell: Read Less [-]

BIO ENG 113 Stem Cells and Technologies 4 Units

Terms offered: Fall 2015, Fall 2014, Fall 2013
This course will teach the main concepts and current views on key attributes of embryonic stem cells (ESC), will introduce theory of their function in embryonic development, methods of ESC derivation, propagation, and characterization, and will discuss currently developing stem cell technologies.
Stem Cells and Technologies: Read More [+]
Rules & Requirements

Prerequisites: BIO ENG 10 and BIOLOGY 1A; or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Conboy

Stem Cells and Technologies: Read Less [-]

BIO ENG 114 Cell Engineering 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2018
This course will teach the main concepts and current views on key attributes of animal cells (somatic, embryonic, pluripotent, germ-line; with the focus on mammalian cells), will introduce theory of the regulation of cell function, methods for deliberate control of cell properties and resulting biomedical and bioengineering technologies.
Cell Engineering: Read More [+]
Objectives & Outcomes

Course Objectives: The goal of this course to establish fundamental understanding of cell engineering technologies and of the key biological paradigms, upon which cell engineering is based, with the focus on biomedical applications of cell engineering.

Student Learning Outcomes: At the completion of this course students will understand how bioengineering technologies address the deliberate control of cell properties (and how this advances biomedicine); and students will learn the main concepts and current views on key attributes of animal cells (somatic, embryonic, pluripotent, germ-line; with the focus on mammalian cells).

Rules & Requirements

Prerequisites: BIOLOGY 1A or BIO ENG 11; or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Conboy

Cell Engineering: Read Less [-]

BIO ENG 115 Tissue Engineering Lab 4 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
This class provides a conceptual and practical understanding of cell and tissue bioengineering that is vital for careers in medicine, biotechnology, and bioengineering. Students are introduced to cell biology laboratory techniques, including immunofluorescence, quantitative image analysis, protein quantification, protein expression, gene expression, and cell culture.
Tissue Engineering Lab: Read More [+]
Objectives & Outcomes

Course Objectives: The goal of this course to provide students with conceptual and practical understanding of cell and tissue bioengineering.

Student Learning Outcomes: At the completion of this course, students will learn key cellular bioengineering laboratory techniques, will develop a conceptual and theoretical understanding of the reliability and limitations of these techniques and will enhance their skills in quantitative data analysis, interpretation and integration.

Rules & Requirements

Prerequisites: BIO ENG 11, BIO ENG 114 or BIO ENG 202, or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 4 hours of laboratory and 2 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Conboy

Tissue Engineering Lab: Read Less [-]

BIO ENG 116 Cell and Tissue Engineering 4 Units

Terms offered: Spring 2016, Spring 2015, Spring 2014
The goal of tissue engineering is to fabricate substitutes to restore tissue structure and functions. Understanding cell function in response to environmental cues will help us to establish design criteria and develop engineering tools for tissue fabrication. This course will introduce the basic concepts and approaches in the field, and train students to design and engineer biological substitutes.
Cell and Tissue Engineering: Read More [+]
Objectives & Outcomes

Course Objectives: (1) To introduce the basics of tissue engineering, including quantitative cell and tissue characterization, stem cells, cell-matrix interaction, cell migration, bioreactors, mechanical regulation, tissue preservation, and immuno-modulation/isolation; (2) To illustrate the cutting-edge research in tissue engineering; (3) To enhance the skills in analyzing and designing engineered tissue products.

Student Learning Outcomes: Students will be able to (1) use mathematical models to analyze cell functions (e.g., proliferation, apoptosis, migration) and mechanical property of tissues, (2) understand scientific and ethical issues of stem cells, (3) engineer natural matrix, biomaterials and drug delivery, (4) understand mass transport and design appropriate bioreactors, (5) understand clinical issues such as tissue preservation, immune responses, immunomodulation and immunoisolation, (6) apply the knowledge to engineering biological substitutes.

Rules & Requirements

Prerequisites: BIO ENG 103 and BIO ENG 104

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Li

Cell and Tissue Engineering: Read Less [-]

UGBA 117 Special Topics in Economic Analysis and Policy 1 - 4 Units

Terms offered: Fall 2018, Spring 2018, Fall 2017
A variety of topics in economic analysis and policy with emphasis on current problems and research.
Special Topics in Economic Analysis and Policy: Read More [+]
Rules & Requirements

Prerequisites: 101A-101B or equivalents

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer: 6 weeks - 2.5-10 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 119

Special Topics in Economic Analysis and Policy: Read Less [-]

BIO ENG C117 Structural Aspects of Biomaterials 4 Units

Terms offered: Fall 2020, Spring 2019, Spring 2018
This course covers the structure and mechanical functions of load bearing tissues and their replacements. Natural and synthetic load-bearing biomaterials for clinical applications are reviewed. Biocompatibility of biomaterials and host response to structural implants are examined. Quantitative treatment of biomechanical issues and constitutive relationships of tissues are covered in order to design biomaterial replacements for structural function. Material selection for load bearing applications including reconstructive surgery, orthopedics, dentistry, and cardiology are addressed. Mechanical design for longevity including topics of fatigue, wear, and fracture are reviewed. Case studies that examine failures of devices are presented.
Structural Aspects of Biomaterials: Read More [+]
Rules & Requirements

Prerequisites: BIOLOGY 1A and MAT SCI 45; CIV ENG 130, CIV ENG 130N, or BIO ENG 102

Credit Restrictions: Students will receive no credit for Mechanical Engineering C117 after completing Mechanical Engineering C215/ Bioengineering C222.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Pruitt

Also listed as: MEC ENG C117

Structural Aspects of Biomaterials: Read Less [-]

UGBA 118 International Trade 3 Units

Terms offered: Fall 2021, Spring 2021, Fall 2019
This course will develop models for understanding the economic causes and effects of international trade, will investigate the effects of economic policies that inhibit trade, and will examine the political economy of trade. By integrating the findings of the latest theoretical and empirical research in international economics, this course help students learn how to explore the current political debates in the U.S. and elsewhere regarding the benefits and costs of international trade.
International Trade: Read More [+]
Rules & Requirements

Prerequisites: Undergraduate Business Administration 101A or equivalent

Credit Restrictions: Students will receive no credit for Undergraduate Business Administration 118 after taking Economics 181 or Economics C181/Environmental Economics and Policy C181.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 2.5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

International Trade: Read Less [-]

BIO ENG C118 Biological Performance of Materials 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
This course is intended to give students the opportunity to expand their knowledge of topics related to biomedical materials selection and design. Structure-property relationships of biomedical materials and their interaction with biological systems will be addressed. Applications of the concepts developed include blood-materials compatibility, biomimetic materials, hard and soft tissue-materials interactions, drug delivery, tissue engineering, and biotechnology.
Biological Performance of Materials: Read More [+]

Objectives & Outcomes

Course Objectives: The course is separated into four parts spanning the principles of synthetic materials and surfaces, principles of biological materials, biological performance of materials and devices, and state-of-the-art materials design. Students are required to attend class and master the material therein. In addition, readings from the clinical, life and materials science literature are assigned. Students are encouraged to seek out additional reference material to complement the readings assigned. A mid-term examination is given on basic principles (parts 1 and 2 of the outline). A comprehensive final examination is given as well. The purpose of this course is to introduce students to problems associated with the selection and function of biomaterials. Through class lectures and readings in both the physical and life science literature, students will gain broad knowledge of the criteria used to select biomaterials, especially in devices where the material-tissue or material-solution interface dominates performance. Materials used in devices for medicine, dentistry, tissue engineering, drug delivery, and the biotechnology industry will be addressed.

This course also has a significant design component (~35%). Students will form small teams (five or less) and undertake a semester-long design project related to the subject matter of the course. The project includes the preparation of a paper and a 20 minute oral presentation critically analyzing a current material-tissue or material-solution problem. Students will be expected to design improvements to materials and devices to overcome the problems identified in class with existing materials.

Student Learning Outcomes:
Apply math, science & engineering principles to the understanding of soft materials, surface chemistry, DLVO theory, protein adsorption kinetics, viscoelasticity, mass diffusion, and molecular (i.e., drug) delivery kinetics.

•
Design experiments and analyze data from the literature in the context of the class design project.
Apply core concepts in materials science to solve engineering problems related to the selection biomaterials, especially in devices where the material-tissue or material-solution interface dominates performance.
Develop an understanding of the social, safety and medical consequences of biomaterial use and regulatory issues associated with the selection of biomaterials in the context of the silicone breast implant controversy and subsequent biomaterials crisis.
Work independently and function on a team, and develop solid communication skills (oral, graphic & written) through the class design project.
•
Understanding of the origin of surface forces and interfacial free energy, and how they contribute to the development of the biomaterial interface and ultimately biomaterial performance.

Rules & Requirements

Prerequisites: MAT SCI 45 and BIO ENG 103. BIO ENG 102 and BIO ENG 104 are recommended

BIO ENG C119 Orthopedic Biomechanics 4 Units

Terms offered: Fall 2020, Fall 2019, Spring 2019
Statics, dynamics, optimization theory, composite beam theory, beam-on-elastic foundation theory, Hertz contact theory, and materials behavior. Forces and moments acting on human joints; composition and mechanical behavior of orthopedic biomaterials; design/analysis of artificial joint, spine, and fracture fixation prostheses; musculoskeletal tissues including bone, cartilage, tendon, ligament, and muscle; osteoporosis and fracture-risk predication of bones; and bone adaptation. MATLAB-based project to integrate the course material.
Orthopedic Biomechanics: Read More [+]

Rules & Requirements

Prerequisites: MEC ENG C85 / CIV ENG C30 or BIO ENG 102 (concurrent enrollment OK). Proficiency in MatLab or equivalent. Prior knowledge of biology or anatomy is not assumed

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Keaveny

Also listed as: MEC ENG C176

Orthopedic Biomechanics: Read Less [-]

UGBA 120AA Intermediate Financial Accounting 1 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
This Course introduces the student to concepts, theory and applications of financial accounting. The topics covered include accrual accounting concepts, financial statement analysis, inventory valuations, capital assets and their corresponding depreciation and impairment. Attention is given to examples on current reporting practices and to the study of reporting requirements promulgated by the Financial Accounting Standards Board ("FASB") with comparison to the International Accounting Standards Board ("IASB").
Intermediate Financial Accounting 1: Read More [+]
Rules & Requirements

Prerequisites: 102A

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1.5 hours of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Intermediate Financial Accounting 1: Read Less [-]

UGBA 120AB Intermediate Financial Accounting 2 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
This course expands students' knowledge of the concepts, theory, and application of financial accounting. It continues the technical accounting sequence, which also includes UGBA 120AA, Intermediate Accounting 1 and UGBA 120B, Advanced Financial Accounting. Topics include an in-depth treatment of the financing elements of the balance sheet and the income statement, as well as a detailed examination of the statement of cash flows.
Intermediate Financial Accounting 2: Read More [+]
Rules & Requirements

Prerequisites: UGBA 102A is required. UGBA 120AA is recommended

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1.5 hours of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Intermediate Financial Accounting 2: Read Less [-]

UGBA 120B Advanced Financial Accounting 4 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
Continuation of 120A. Sources of long term capital; funds statements, financial analysis, accounting for partnerships, consolidated financial statements, adjustments of accounting data using price indexes; accounting for the financial effects of pension plans; other advanced accounting problems.
Advanced Financial Accounting: Read More [+]
Rules & Requirements

Prerequisites: UGBA 120AA and 120AB are recommended

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1.5 hours of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Advanced Financial Accounting: Read Less [-]

BIO ENG 121 BioMEMS and Medical Devices 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
Biophysical and chemical principles of biomedical devices, bionanotechnology, bionanophotonics, and biomedical microelectromechanical systems (BioMEMS). Topics include basics of nano- and microfabrication, soft-lithography, DNA arrays, protein arrays, electrokinetics, electrochemical, transducers, microfluidic devices, biosensor, point of care diagnostics, lab-on-a-chip, drug delivery microsystems, clinical lab-on-a-chip, advanced biomolecular probes, etc.
BioMEMS and Medical Devices: Read More [+]
Rules & Requirements

Prerequisites: CHEM 3A; PHYSICS 7A and PHYSICS 7B; and BIO ENG 104 or equivalent transport course

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructors: Lee, Streets

BioMEMS and Medical Devices: Read Less [-]

UGBA 121 Federal Income Tax Accounting 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
Determination of individual and corporation tax liability; influence of federal taxation on economic activity; tax considerations in business and investment decisions.
Federal Income Tax Accounting: Read More [+]
Rules & Requirements

Prerequisites: 102A (120AA recommended)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1.5 hours of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Federal Income Tax Accounting: Read Less [-]

BIO ENG 121L BioMems and BioNanotechnology Laboratory 4 Units

Terms offered: Spring 2022, Fall 2021, Spring 2020
Students will become familiar with BioMEMS and Lab-on-a-Chip research. Students will design and fabricate their own novel micro- or nano-scale device to address a specific problem in biotechnology using the latest micro- and nano-technological tools and fabrication techniques. This will involve an intensive primary literature review, experimental design, and quantitative data analysis. Results will be presented during class presentations and at a final poster symposium.
BioMems and BioNanotechnology Laboratory: Read More [+]
Objectives & Outcomes

Course Objectives: Students will become familiar with research associated with BioMEMS and Lab-on-a-Chip technologies. Students will gain experience in using creative design to solve a technological problem. Students will learn basic microfabrication techniques. Working in engineering teams, students will learn how to properly characterize a novel device
by choosing and collecting informative metrics. Students will design and carry out carefully controlled experiments that will result in the analysis of quantitative data.

Student Learning Outcomes: Students will learn how to critically read BioMEMS and Lab-on-a-Chip primary literature. Students will learn how to use AutoCAD software to design microscale device features. Students will gain hands-on experience in basic photolithography and soft lithography. Students will get experience with a variety of fluid loading interfaces and
microscopy techniques. Students will learn how to design properly controlled uantitative experiments. Students will gain experience in presenting data to their peers in the form of powerpoint presentations and also at a poster symposium.

Rules & Requirements

Prerequisites: BIO ENG 104; and BIO ENG 121 (can be taken concurrently)

Credit Restrictions: Students will receive no credit for 121L after taking 221L.

Hours & Format

Fall and/or spring: 15 weeks - 6 hours of laboratory and 2 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Liepmann

BioMems and BioNanotechnology Laboratory: Read Less [-]

UGBA 122 Financial Information Analysis 4 Units

Terms offered: Summer 2022 First 6 Week Session, Spring 2022, Fall 2021

This course is designed to: 1) develop basic skills in financial statement analysis; 2) teach students to identify the relevant financial data used in a variety of decision contexts, such as equity valuation, forecasting firm-level economic variables, distress prediction and credit analysis; 3) help students appreciate the factors that influence the outcome of the financial reporting process, such as the incentives of reporting parties, regulatory rules, and a firm's competitive environment.

Financial Information Analysis: Read More [+]

Rules & Requirements

Prerequisites: 120AA

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1.5 hours of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Financial Information Analysis: Read Less [-]

UGBA 123 Operating and Financial Reporting Issues in the Financial Services Industry 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

This course examines how accounting in the financial services industry – banking, insurance, investment industry, and real estate – actually operates. Students learn about underwriting and pricing in each sector, investment processes and controls, incentive-based profit sharing, risk management, and the factors that contribute to profitability. Students learn what financial statements reveal about estimates companies make regarding liabilities and, more generally, what they reveal about how companies deal with uncertainty associated with predicting and measuring financial results. Students examine the controversy over employing Fair Value Accounting across sectors and learn about other sector-specific accounting requirements.

Operating and Financial Reporting Issues in the Financial Services Industry: Read More [+]

Rules & Requirements

Prerequisites: Students are encouraged to complete UGBA 102A or to possess a basic understanding about how financial statements are prepared

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Operating and Financial Reporting Issues in the Financial Services Industry: Read Less [-]

BIO ENG 124 Basic Principles of Drug Delivery 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
This course focuses on providing students with the foundations needed to understand contemporary literature in drug delivery. Concepts in organic chemistry, biochemistry, and physical chemistry needed to understand current problems in drug delivery are emphasized.
Basic Principles of Drug Delivery: Read More [+]
Objectives & Outcomes

Course Objectives: The goal of this course is to give students the ability to understand problems in drug delivery. Emphasis is placed on the design and synthesis of new molecules for drug delivery.

Student Learning Outcomes: At the completion of this course students should be able to design new molecules to solve drug delivery problems.

Rules & Requirements

Prerequisites: BIO ENG 11 or CHEM 3B; BIO ENG 103 and BIO ENG 104

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Murthy

Basic Principles of Drug Delivery: Read Less [-]

UGBA 125 Ethics in Accounting 3 Units

Terms offered: Fall 2021, Fall 2020, Spring 2020
This course focuses on ethics related to the accounting for and reporting of financial statements and related financial information, and touches on the ethics of tax preparers. It is taught within the context of the American Institute of Certified Public Accountants (AICPA), as well as broader ethical concepts. This course fulfills the accounting ethics education requirement of the California Board of Accountancy, needed for a California CPA license. The course covers (i) theories and rules and (ii) the application of these theories and rules to case studies drawn from real life. Students are taught not only to identify the risks of fraud, but also how an organization's culture and structure might be altered to reduce the risks.
Ethics in Accounting: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Ethics in Accounting: Read Less [-]

BIO ENG C125 Introduction to Robotics 4 Units

Terms offered: Fall 2017, Fall 2016, Fall 2015
An introduction to the kinematics, dynamics, and control of robot manipulators, robotic vision, and sensing. The course covers forward and inverse kinematics of serial chain manipulators, the manipulator Jacobian, force relations, dynamics, and control. It presents elementary principles on proximity, tactile, and force sensing, vision sensors, camera calibration, stereo construction, and motion detection. The course concludes with current applications of robotics in active perception, medical robotics, and other areas.
Introduction to Robotics: Read More [+]
Rules & Requirements

Prerequisites: EL ENG 120 or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture, 1 hour of discussion, and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Bajcsy

Formerly known as: Electrical Engineering C125/Bioengineering C125

Also listed as: EL ENG C106A

Introduction to Robotics: Read Less [-]

BIO ENG C125B Robotic Manipulation and Interaction 4 Units

Terms offered: Spring 2017, Spring 2016
This course is a sequel to Electrical Engineering C106A/Bioengineering C125, which covers kinematics, dynamics and control of a single robot. This course will cover dynamics and control of groups of robotic manipulators coordinating with each other and interacting with the environment. Concepts will include an introduction to grasping and the constrained manipulation, contacts and force control for interaction with the environment. We will also cover active perception guided manipulation, as well as the manipulation of non-rigid objects. Throughout, we will emphasize design and human-robot interactions, and applications to applications in manufacturing, service robotics, tele-surgery, and locomotion.
Robotic Manipulation and Interaction: Read More [+]
Rules & Requirements

Prerequisites: EECS C106A / BIO ENG C125 or consent of the instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture, 1 hour of discussion, and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructors: Bajcsy, Sastry

Also listed as: EL ENG C106B

Robotic Manipulation and Interaction: Read Less [-]

UGBA 126 Auditing 4 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
Concepts and problems in the field of professional verification of financial and related information, including ethical, legal and other professional issues, historical developments, and current concerns.
Auditing: Read More [+]
Rules & Requirements

Prerequisites: 120AA (120AB and 120B recommended)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1.5 hours of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Auditing: Read Less [-]

UGBA 127 Special Topics in Accounting 1 - 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
A variety of topics in accounting with emphasis on current problems and research.
Special Topics in Accounting: Read More [+]
Rules & Requirements

Prerequisites: At the discretion of the instructor

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture and 0-1 hours of discussion per week

Summer: 6 weeks - 2.5-10 hours of lecture and 0-2.5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Special Topics in Accounting: Read Less [-]

UGBA 128 Strategic Cost Management 3 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
Managerial accounting is a company's internal language and is used for decision-making, production management, product design and pricing, performance evaluation and motivation of employees. The objective of the course is to develop the skills and analytical ability of effectively and efficiently use managerial accounting information in order to help a company achieve its strategic and financial goals.
Strategic Cost Management: Read More [+]
Rules & Requirements

Prerequisites: 102B

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Strategic Cost Management: Read Less [-]

BIO ENG 131 Introduction to Computational Molecular and Cell Biology 4 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016
Topics include computational approaches and techniques to gene structure and genome annotation, sequence alignment using dynamic programming, protein domain analysis, RNA folding and structure prediction, RNA sequence design for synthetic biology, genetic and biochemical pathways and networks, UNIX and scripting languages, basic probability and information theory. Various "case studies" in these areas are reviewed; web-based computational biology tools will be used by students and programming projects will be given. Computational biology research connections to biotechnology will be explored.
Introduction to Computational Molecular and Cell Biology: Read More [+]
Objectives & Outcomes

Course Objectives: To introduce the biological databases and file formats commonly used in computational biology. (2) To familiarize students with the use of Unix scripting languages in bioinformatics workflows. (3) To introduce common algorithms for sequence alignment, RNA structure prediction, phylogeny and clustering, along with fundamentals of probability, information theory and algorithmic complexity analysis.

Student Learning Outcomes: Students will be able to use knowledge from the lectures and lab sessions to write simple programs to parse bioinformatics file formats and execute basic algorithms, to analyze algorithmic complexity, to navigate and (for simple cases) set up biological databases containing biological data (including sequences, genome annotations and protein structures), and to use basic statistics to interpret results of compbio analyses.

Rules & Requirements

Prerequisites: BIO ENG 11 or BIOLOGY 1A (may be taken concurrently); plus a programming course (ENGIN 7 or COMPSCI 61A)

Credit Restrictions: Students will receive no credit for BIO ENG 131 after completing BIO ENG 231. A deficient grade in BIO ENG 131 may be removed by taking BIO ENG C131.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1.5 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Holmes

Introduction to Computational Molecular and Cell Biology: Read Less [-]

UGBA 131 Corporate Finance and Financial Statement Analysis 3 Units

Terms offered: Summer 2022 Second 6 Week Session, Spring 2022, Fall 2021
This course will cover the principles and practice of business finance. It will focus on project evaluation, capital structure, and corporate governance. Firms' policies toward debt, equity, and dividends are explored. The incentives and conflicts facing managers and owners are also discussed.
Corporate Finance and Financial Statement Analysis: Read More [+]
Rules & Requirements

Prerequisites: 103

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 134

Corporate Finance and Financial Statement Analysis: Read Less [-]

UGBA 131A Corporate Strategy and Valuation 3 Units

Terms offered: Spring 2022, Spring 2020, Spring 2019
The course is designed to cover advanced corporate finance issues. Its purpose is two-fold. First, it will help students develop a tool-box, both conceptual and quantitative, to address real-world corporate financial issues that they will likely use immediately in any finance-related career. Second, the course is designed to give the “the big picture,” i.e., sharpen understanding of how corporate financial strategy helps increase a firm’s value in a dynamic environment. The course examines qualitative factors that help determine financial strategy, including the costs of financial distress and the value of financial flexibility, as well as quantitative techniques, such as option pricing, that will be helpful in various analyses.
Corporate Strategy and Valuation: Read More [+]
Rules & Requirements

Prerequisites: Undergraduate Business Administration 103

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Corporate Strategy and Valuation: Read Less [-]

BIO ENG C131 Introduction to Computational Molecular and Cell Biology 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
This class teaches basic bioinformatics and computational biology, with an emphasis on alignment, phylogeny, and ontologies. Supporting foundational topics are also reviewed with an emphasis on bioinformatics topics, including basic molecular biology, probability theory, and information theory.
Introduction to Computational Molecular and Cell Biology: Read More [+]
Rules & Requirements

Prerequisites: BioE 11 or Bio 1A (may be taken concurrently), plus a programming course (ENGIN 7 or CS 61A)

Credit Restrictions: Students will receive no credit for BIO ENG C131 after completing BIO ENG 131, BIO ENG C131, or BIO ENG C131. A deficient grade in BIO ENG C131 may be removed by taking BIO ENG C131, or BIO ENG C131.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Holmes

Also listed as: CMPBIO C131

Introduction to Computational Molecular and Cell Biology: Read Less [-]

BIO ENG 132 Genetic Devices 4 Units

Terms offered: Spring 2018, Fall 2014, Fall 2013
This senior-level course is a comprehensive survey of genetic devices. These DNA-based constructs are comprised of multiple "parts" that together encode a higher-level biological behavior and perform useful human-defined functions. Such constructs are the engineering target for most projects in synthetic biology. Included within this class of constructs are genetic circuits, sensors, biosynthetic pathways, and microbiological functions.
Genetic Devices: Read More [+]
Objectives & Outcomes

Course Objectives: (1) To introduce the basic biology and engineering principles for constructing genetic devices including biochemical devices, microbiological devices, genetic circuits, eukaryotic devices, and developmental devices, (2) To familiarize students with current literature examples of genetic devices and develop literature searching skills; (3) To develop the students' ability to apply computational tools to the design of genetic devices.

Student Learning Outcomes: Students will be able to (1) use mathematical models to describe the dynamics of genetic devices, (2) comprehend and evaluate publications related to any type of genetic device, (3) perform a thorough literature search, (4) evaluate the technical plausibility of a proposed genetic device, (5) analyze a design challenge and propose a plausible solution to it in the form of a genetic device, and (6) assess any ethical or safety issues associated with a proposed genetic device.

Rules & Requirements

Prerequisites: COMPSCI 61A, MATH 53, MATH 54, CHEM 3A, and BIO ENG 103; CHEM 3B or BIO ENG 11

Credit Restrictions: Students will receive no credit for 132 after taking 232.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Anderson

Genetic Devices: Read Less [-]

UGBA 132 Financial Institutions and Markets 3 Units

Terms offered: Summer 2020 First 6 Week Session, Summer 2019 First 6 Week Session, Summer 2018 First 6 Week Session
Organization, behavior, and management of financial institutions. Markets for financial assets and the structure of yields, influence of Federal Reserve System and monetary policy on financial assets and institutions.
Financial Institutions and Markets: Read More [+]

Rules & Requirements

Prerequisites: 101A-101B, and 103

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 6 weeks - 8 hours of lecture and 2.5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 132

Financial Institutions and Markets: Read Less [-]

BIO ENG 133 Biomolecular Engineering 3 Units

Terms offered: Prior to 2007
This is an introductory course of biomolecular engineering and is required for all CBE graduate students. Undergraduates with knowledge of thermodynamics and transport are also welcome. The topics include structures, functions, and dynamics of biomolecules; molecular tools in biotechnology; metabolic and signaling networks in cellular engineering; and synthetic biology and biomedical engineering applications.
Biomolecular Engineering: Read More [+]

Objectives & Outcomes

Course Objectives: Students are expected to become familiar with the terminologies, molecules, and mechanisms, i.e., the language of biomolecular engineering. At end of this course, you are expected to be able to analyze and critique modern literature in related research areas.

Student Learning Outcomes: Students will be able to (1) understand the biochemical basis for protein folding and enzymatic function, (2) mathematically analyze enzyme function, either individually or as part of a metabolic pathway, (3) engineer novel enzymes using rational, computational, and directed evolution based approaches, (4) understand principles of metabolic engineering and synthetic biology, (5) understand the dynamics and mechanisms of cellular signal transduction, and (6) understand principles for engineering cellular signaling and function.

Rules & Requirements

Prerequisites: BIO ENG 104; or CHM ENG 150A and CHM ENG 150B; or consent of instructor. A course in statistical mechanics and/or thermodynamics is recommended

Credit Restrictions: Students will receive no credit for Bioengineering 133 after completing Chemical Engineering C274, Molecular and Cell Biology C274 or Bioengineering C233.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Schaffer

Biomolecular Engineering: Read Less [-]

UGBA 133 Investments 3 Units

Terms offered: Summer 2022 First 6 Week Session, Summer 2022 Second 6 Week Session, Fall 2021
Sources of and demand for investment capital, operations of security markets, determination of investment policy, and procedures for analysis of securities.
Investments: Read More [+]

Rules & Requirements

Prerequisites: 103

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 6 weeks - 7.5 hours of lecture and 2.5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Investments: Read Less [-]

BIO ENG 134 Genetic Design Automation 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
Genetic Design Automation is the use of software to design and manage genetics experiments. This course introduces the interface between object-oriented programming and wetlab synthetic biology in a hands-on manner. Through a series of programming assignments, each student will build a computer program that automatically designs experiments starting from a formal specification. They will then independently build a new software module of their own design to augment the basic platform
Genetic Design Automation: Read More [+]

Objectives & Outcomes

Course Objectives: (1) To develop the skill of translating experimental design into computer code, (2) Develop familiarity with state-of-the-art infrastructure for wetlab automation, (3) Develop proficiency in software development

Student Learning Outcomes: students will be able to (1) Describe molecular biology entities and operations in terms of data structures, (2) Develop moderately-sized computer programs, (3) Write tests and benchmarking suites for biological algorithms (4) Explore different algorithmic approaches to problems and assess their relative merits and efficiencies, (5) Develop proficiency in conceiving and implementing software projects of their own design as they relate to biological problems

Rules & Requirements

Prerequisites: COMPSCI 61B, BIO ENG 11 and BIO ENG 103

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: J. Christopher Anderson

Genetic Design Automation: Read Less [-]

UGBA 134 Introduction to Financial Engineering 3 Units

Terms offered: Spring 2019
This course provides students with an introduction to the application of mathematics and statistics in the field of finance. It consists of three integrated modules: 1) an introduction to the quantitative foundations of finance, using calculus, linear algebra, statistics and probability; 2) extension into financial theory as it relates to asset pricing, fixed income, derivatives, structured finance and risk management; and 3) application and implementation of these foundational tools and theory through software like Excel to build basic quantitative financial models (touching on programming). The goal is to use financial models that can guide business and financial decisions.
Introduction to Financial Engineering: Read More [+]

Rules & Requirements

Prerequisites: UGBA 103

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Introduction to Financial Engineering: Read Less [-]

BIO ENG 135 Frontiers in Microbial Systems Biology 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
This course is aimed at graduate and advanced undergraduate students from the (bio) engineering and chemo-physical sciences interested in a research-oriented introduction to current topics in systems biology. Focusing mainly on two well studied microbiological model systems--the chemotaxis network and Lambda bacteriophage infection--the class systematically introduces key concepts and techniques for biological network deduction, modelling, analysis, evolution, and synthetic network design. Students analyze the impact of approaches from the quantitative sciences--such as deterministic modelling, stochastic processes, statistics, non-linear dynamics, control theory, information theory, graph theory, etc.--on understanding biological processes, including (stochastic) gene regulation, signalling, network evolution, and synthetic network design. The course aims to identify unsolved problems and discusses possible novel approaches while encouraging students to develop ideas to explore new directions in their own research.
Frontiers in Microbial Systems Biology: Read More [+]

Rules & Requirements

Prerequisites: Upper division standing with background in differential equations and probability. Coursework in molecular and cell biology or biochemistry recommended

Credit Restrictions: Students will receive no credit for 135 after taking 235.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Arkin, Bischofs-Pfeifer, Wolf

Frontiers in Microbial Systems Biology: Read Less [-]

UGBA 135 Personal Financial Management 2 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
Survey of major life financial decisions (e.g., career choice, consumption versus saving, investments, mortgages, insurance) and how decision-making biases (e.g., overconfidence, present bias, limited attention) can lead to suboptimal choice. The course draws on research from economics, psychology, and sociology.
Personal Financial Management: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Odean, Selinger

Personal Financial Management: Read Less [-]

UGBA 136F Behavioral Finance 3 Units

Terms offered: Summer 2022 Second 6 Week Session, Summer 2021 Second 6 Week Session, Summer 2020 Second 6 Week Session
This course explores why markets are sometimes inefficient. We consider the role that investors' heuristics and biases play in generating mispricing in financial markets. We also explore how various trading frictions limit the ability of arbitrageurs to reduce mispricing. Finally, we look at the influence of market inefficiencies on corporate decisions.
Behavioral Finance: Read More [+]
Rules & Requirements

Prerequisites: 103

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Behavioral Finance: Read Less [-]

BIO ENG C136L Laboratory in the Mechanics of Organisms 3 Units

Terms offered: Spring 2015, Spring 2014, Spring 2013, Spring 2012
Introduction to laboratory and field study of the biomechanics of animals and plants using fundamental biomechanical techniques and equipment. Course has a series of rotations involving students in experiments demonstrating how solid and fluid mechanics can be used to discover the way in which diverse organisms move and interact with their physical environment. The laboratories emphasize sampling methodology, experimental design, and statistical interpretation of results. Latter third of course devoted to independent research projects. Written reports and class presentation of project results are required.
Laboratory in the Mechanics of Organisms: Read More [+]
Rules & Requirements

Prerequisites: INTEGBI 135 or consent of instructor. For Electrical Engineering and Computer Sciences students: EL ENG 105, EL ENG 120 or COMPSCI 184

Credit Restrictions: Students will receive no credit for C135L after taking 135L.

Hours & Format

Fall and/or spring: 15 weeks - 6 hours of laboratory, 1 hour of discussion, and 1 hour of fieldwork per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Integrative Biology 135L

Also listed as: EL ENG C145O/INTEGBI C135L

Laboratory in the Mechanics of Organisms: Read Less [-]

UGBA 137 Special Topics in Finance 1 - 4 Units

Terms offered: Summer 2022 Second 6 Week Session, Spring 2022, Fall 2021
A variety of topics in finance with emphasis on current problems and research.
Special Topics in Finance: Read More [+]
Rules & Requirements

Prerequisites: 103

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer: 6 weeks - 2.5-10 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 139

Special Topics in Finance: Read Less [-]

BIO ENG C137 Designing for the Human Body 4 Units

Terms offered: Fall 2019, Fall 2018, Fall 2017
The course provides project-based learning experience in understanding product design, with a focus on the human body as a mechanical machine. Students will learn the design of external devices used to aid or protect the body. Topics will include forces acting on internal materials (e.g., muscles and total replacement devices), forces acting on external materials (e.g., prothetics and crash pads), design/analysis of devices aimed to improve or fix the human body, muscle adaptation, and soft tissue injury. Weekly laboratory projects will incorporate EMG sensing, force plate analysis, and interpretation of data collection (e.g., MATLAB analysis) to integrate course material to better understand contemporary design/analysis/problems.
Designing for the Human Body: Read More [+]
Objectives & Outcomes

Course Objectives: The purpose of this course is twofold:
•
to learn the fundamental concepts of designing devices to interact with the human body;
•
to enhance skills in mechanical engineering and bioengineering by analyzing the behavior of various complex biomedical problems;
•
To explore the transition of a device or discovery as it goes from “benchtop to bedside”.

Student Learning Outcomes: RELATIONSHIP OF THE COURSE TO ABET PROGRAM OUTCOMES
(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(d) an ability to function on multi-disciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Working knowledge of design considerations for creating a device to protect or aid the human body, force transfer and distribution, data analysis, and FDA approval process for new devices. Understanding of basic concepts in orthopaedic biomechanics and the ability to apply the appropriate engineering concepts to solve realistic biomechanical problems, knowing clearly the assumptions involved. Critical analysis of current literature and technology.

Rules & Requirements

Prerequisites: PHYSICS 7A, MATH 1A, and MATH 1B. Proficiency in MatLab or equivalent. Prior knowledge of biology or anatomy is not assumed

Credit Restrictions: There will be no credit given for MEC ENG C178 / BIO ENG C137 after taking MEC ENG 178.

Hours & Format

Fall and/or spring: 15 weeks - 1-3 hours of lecture per week

BIO ENG 140L Synthetic Biology Laboratory 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
This laboratory course is designed as an introduction to research in synthetic biology, a ground-up approach to genetic engineering with applications in bioenergy, heathcare, materials science, and chemical production. In this course, we will design and execute a real research project. Each student will be responsible for designing and constructing components for the group project and then performing experiments to analyze the system. In addition to laboratory work, we will have lectures on methods and design concepts in synthetic biology including an introduction to Biobricks, gene synthesis, computer modeling, directed evolution, practical molecular biology, and biochemistry.
Synthetic Biology Laboratory: Read More [+]
Objectives & Outcomes

Course Objectives: Designing and interpreting biological experiments
Learning how to plan, coordinate, and implement a genetic engineering project in a group format
To master the wetlab techniques of synthetic biology

Student Learning Outcomes: Students will be able to examine analytical data, interpret controls, and make decisions about next steps.
Students will be able to perform synthetic biology experiments including reagent preparation, DNA manipulation, analytical methods, and microbiological techniques.
Students will be able to understand responsible conduct expectations for wetlab experimentalists.
Students will be able to understand the techniques and protocols used in synthetic biology.
Students will be able to work within a team and develop communication skills.

Rules & Requirements

Prerequisites: BIO ENG 11 or BIOLOGY 1A

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 6 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Anderson

Synthetic Biology Laboratory: Read Less [-]

UGBA 141 Production and Operations Management 2 - 3 Units

Terms offered: Spring 2022, Spring 2021, Spring 2017
A survey of the concepts and methodologies for management control of production and operations systems. Topics include inventory control, material requirements planning for multistage production systems, aggregate planning, scheduling, and production distribution.
Production and Operations Management: Read More [+]
Rules & Requirements

Prerequisites: 104 or equivalent, or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 2-3 hours of lecture and 0-1 hours of discussion per week

Summer: 6 weeks - 5-7.5 hours of lecture and 0-2.5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 142

Production and Operations Management: Read Less [-]

BIO ENG 143 Computational Methods in Biology 4 Units

Terms offered: Fall 2011, Fall 2010, Fall 2009
An introduction to biophysical simulation methods and algorithms, including molecular dynamics, Monte Carlo, mathematical optimization, and "non-algorithmic" computation such as neural networks. Various case studies in applying these areas in the areas of protein folding, protein structure prediction, drug docking, and enzymatics will be covered. Core Specialization: Core B (Informatics and Genomics); Core D (Computational Biology); BioE Content: Biological.
Computational Methods in Biology: Read More [+]
Rules & Requirements

Prerequisites: MATH 53 and MATH 54. Programming experience preferred but not required

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture, 1 hour of discussion, and 2 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Head-Gordon

Computational Methods in Biology: Read Less [-]

UGBA 143 Game Theory and Business Decisions 3 Units

Terms offered: Fall 2014, Fall 2013, Spring 2010
This course provides an introduction to game theory and decision analysis. Game theory is concerned with strategic interactions among players (multi-player games), and decision analysis is concerned with making choices under uncertainty (single-player games). Emphasis is placed on applications.
Game Theory and Business Decisions: Read More [+]
Rules & Requirements

Prerequisites: Mathematics 1B or 16B, Statistics 21, or equivalent

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Game Theory and Business Decisions: Read Less [-]

BIO ENG 144 Introduction to Protein Informatics 4 Units

Terms offered: Spring 2017, Fall 2008, Fall 2007
This course will introduce students to the bioinformatics algorithms used by biologists to identify homologs, construct multiple sequence alignments, predict protein structure, estimate phylogenetic trees, identify orthologs, predict protein-protein interaction, and build hidden Markov models. The focus is on the algorithms used, and on the sources of various types of errors in these methods.
Introduction to Protein Informatics: Read More [+]
Objectives & Outcomes

Course Objectives: This course is designed to provide a theoretical framework for protein sequence and structure analysis using bioinformatics software tools. Students completing this course will be prepared for subsequent in-depth studies in bioinformatics, for algorithm development, and for the use of bioinformatics methods for biological discovery. It is aimed at two populations: students in the life sciences who need to become expert users of bioinformatics tools, and students in engineering and mathematics/computer science who wish to become the developers of the next generation of bioinformatics methods. As virtually all the problems in this field are very complex, there are many opportunities for research and development of new methods.

Student Learning Outcomes: Students completing this course are likely to find several potential areas of research of interest, which they may want to work on as independent study projects during undergraduate work, or take on as Master's or Ph.D. thesis topics for advanced work.

Rules & Requirements

Prerequisites: Prior coursework in algorithms. No prior coursework in biology is required. This course includes no programming projects and prior experience in programming is not required

Credit Restrictions: BioE 244 or BioE C244L/PMB C244

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Sjolander

Formerly known as: Bioengineering C144/Plant and Microbial Biology C144

Introduction to Protein Informatics: Read Less [-]

BIO ENG 144L Protein Informatics Laboratory 3 Units

Terms offered: Fall 2008
This course is intended to provide hands-on experience with a variety of bioinformatics tools, web servers, and databases that are used to predict protein function and structure. This course will cover numerous bioinformatics tasks including: homolog detection using BLAST and PSI-BLAST, hidden Markov model construction and use, multiple sequence alignment, phylogenetic tree construction, ortholog identification, protein structure prediction, active site prediction, cellular localization, protein-protein interaction and phylogenomic analysis. Some minimal programming/scripting skills (e.g., Perl or Python) are required to complete some of the labs.
Protein Informatics Laboratory: Read More [+]

Rules & Requirements

Prerequisites: One upper-division course in molecular biology or biochemistry (e.g., MCELLBI C100A / CHEM C130 or equivalent); and Python programming (e.g. COMPSCI 61A) and experience using command-line tools in a Unix environment

Credit Restrictions: Bio Eng 244L or Bio Eng C244L/PMB C244L

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of laboratory and 2 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Sjolander

Formerly known as: Bioengineering C144L/Plant and Microbial Biology C144L

Protein Informatics Laboratory: Read Less [-]

BIO ENG 145 Introduction to Machine Learning for Computational Biology 4 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
Genome-scale experimental data and modern machine learning methods have transformed our understanding of biology. This course investigates classical approaches and recent machine learning advances in genomics including:
1)Computational models for genome analysis
2)Applications of machine learning to high throughput biological data
3)Machine learning for genomic data in health
This course builds on existing skills to introduce methodologies for probabilistic modeling, statistical learning, and dimensionality reduction, while grounding these methods in understanding genomic information.
Introduction to Machine Learning for Computational Biology: Read More [+]

Objectives & Outcomes

Course Objectives: This course aims to equip students with a foundational understanding of computational and machine learning techniques used in genomics and computational biology.

Student Learning Outcomes: Students completing this course should have a better understanding of some of the challenges in machine learning as applied to biology
Students completing this course should have stronger programming skills.
Students completing this course should have the ability to apply simple statistical and machine learning techniques to complex genomics data

Rules & Requirements

Prerequisites: Bio 1A or BioE 11, Math 54, CS61B; CS70 or Math 55 recommended

Credit Restrictions: Students will receive no credit for BIO ENG 145 after completing BIO ENG 245. A deficient grade in BIO ENG 145 may be removed by taking BIO ENG 245.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Lareau

Introduction to Machine Learning for Computational Biology: Read Less [-]

BIO ENG C145L Introductory Electronic Transducers Laboratory 3 Units

Terms offered: Fall 2014, Fall 2013, Fall 2012
Laboratory exercises exploring a variety of electronic transducers for measuring physical quantities such as temperature, force, displacement, sound, light, ionic potential; the use of circuits for low-level differential amplification and analog signal processing; and the use of microcomputers for digital sampling and display. Lectures cover principles explored in the laboratory exercises; construction, response and signal to noise of electronic transducers and actuators; and design of circuits for sensing and controlling physical quantities.
Introductory Electronic Transducers Laboratory: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Derenzo

Also listed as: EL ENG C145L

Introductory Electronic Transducers Laboratory: Read Less [-]

BIO ENG C145M Introductory Microcomputer Interfacing Laboratory 3 Units

Terms offered: Spring 2013, Spring 2012, Spring 2011
Laboratory exercises constructing basic interfacing circuits and writing 20-100 line C programs for data acquisition, storage, analysis, display, and control. Use of the IBM PC with microprogrammable digital counter/timer, parallel I/O port. Circuit components include anti-aliasing filters, the S/H amplifier, A/D and D/A converters. Exercises include effects of aliasing in periodic sampling, fast Fourier transforms of basic waveforms, the use of the Hanning filter for leakage reduction, Fourier analysis of the human voice, digital filters, and control using Fourier deconvolution. Lectures cover principles explored in the lab exercises and design of microcomputer-based systems for data acquisitions, analysis and control.
Introductory Microcomputer Interfacing Laboratory: Read More [+]
Rules & Requirements

Prerequisites: EE 16A & 16B

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Derenzo

Also listed as: EL ENG C145M

Introductory Microcomputer Interfacing Laboratory: Read Less [-]

UGBA 146 Project Management 2 Units

Terms offered: Summer 2022 First 6 Week Session, Summer 2021 First 6 Week Session, Summer 2020 First 6 Week Session
The primary objective of this course is to develop the critical skills and knowledge needed to successfully pitch and lead projects, and to deliver those projects on time and within budget. The course delves into formal planning and scheduling techniques including: project definition, project selection, Work Breakdown Structure (WBS), Resource Estimation, Critical Path Method (CPM), Pert, Gantt Charts, Resource Constrained Scheduling, Project Monitoring and Project Closing.
Project Management: Read More [+]
Hours & Format

Summer: 6 weeks - 5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Project Management: Read Less [-]

BIO ENG 147 Principles of Synthetic Biology 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
The field of synthetic biology is quickly emerging as potentially one of the most important and profound ways by which we can understand and manipulate our physical world for desired purposes. In this course, the field and its natural scientific and engineering basis are introduced. Relevant topics in cellular and molecular biology and biophysics, dynamical and engineering systems, and design and operation of natural and synthetic circuits are covered in a concise manner that then allows the student to begin to design new biology-based systems.
Principles of Synthetic Biology: Read More [+]

Objectives & Outcomes

Course Objectives: (1) To introduce the basics of Synthetic Biology, including quantitative cellular network characterization and modeling, (2) to introduce the principles of discovery and genetic factoring of useful cellular activities into reusable functions for design, (3) to inculcate the principles of biomolecular system design and diagnosis of designed systems, and (4) to illustrate cutting-edge applications in Synthetic Biology and to enhance skull sin analyzing and designing synthetic biological applications.

Student Learning Outcomes: The goals of this course are to enable students to: (1) design simple cellular circuitry to meet engineering specification using both rational/model-based and library-based approaches, (2) design experiments to characterize and diagnose operation of natural and synthetic biomolecular network functions, and (3) understand scientific, safety and ethical issues of synthetic biology.

Rules & Requirements

Prerequisites: MATH 53 and MATH 54; and BIO ENG 103 or consent of instructor

Credit Restrictions: Students will receive no credit for 147 after taking 247.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Arkin

Principles of Synthetic Biology: Read Less [-]

UGBA 147 Special Topics in Operations and Information Technology Management 1 - 4 Units

Terms offered: Summer 2022 First 6 Week Session, Spring 2022, Summer 2021 First 6 Week Session
A variety of topics in manufacturing and information technology with emphasis on current problems and research.
Special Topics in Operations and Information Technology Management: Read More [+]

Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer: 6 weeks - 2.5-10 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Special Topics in Operations and Information Technology Management: Read Less [-]

BIO ENG 148 Bioenergy and Sustainable Chemical Synthesis: Metabolic Engineering and Synthetic Biology Approaches 3 Units

Terms offered: Fall 2020, Fall 2018, Fall 2017
This course will cover metabolic engineering and the various synthetic biology approaches for optimizing pathway performance. Use of metabolic engineering to produce biofuels and general "green technology" will be emphasized since these aims are currently pushing these fields. The course is meant to be a practical guide for metabolic engineering and the related advances in synthetic biology as well the related industrial research and opportunities.
Bioenergy and Sustainable Chemical Synthesis: Metabolic Engineering and Synthetic Biology Approaches: Read More [+]
Objectives & Outcomes

Course Objectives: (1) Learn the common engineered metabolic pathways for biofuel biosynthesis
(2) analytical methods
(3) synthetic biology approaches
(4) Industry technologies and opportunities

Student Learning Outcomes: Students will learn (1) the common pathways used for biofuel synthesis and framework for the biosynthesis of specialty chemicals, (2) analytical methods for quantitative measurements of metabolic pathways, (3) synthetic biology approaches for increasing overall pathway performance, and how to (4) utilize available online resources for culling information from large data sources.

Rules & Requirements

Prerequisites: CHEM 3A and BIO ENG 103

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Dueber

Bioenergy and Sustainable Chemical Synthesis: Metabolic Engineering and Synthetic Biology Approaches: Read Less [-]

BIO ENG 150 Introduction of Bionanoscience and Bionanotechnology 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
This course is intended for the bioengineering or engineering undergraduate students interested in acquiring a background in recent development of bio-nanomaterials and bio-nanotechnology. The emphasis of the class is to understand the properties of biological basis building blocks, their assembly principles in nature, and their application to build functional materials and devices.
Introduction of Bionanoscience and Bionanotechnology: Read More [+]
Objectives & Outcomes

Course Objectives: I.
Basic building blocks and governing forces: This part is intended to enhance the understanding of the structures and properties of biological basic building blocks and their governing forces to assemble the biological materials. This part covers the chemical structures of amino acids, ribonucleic acids, hydrocarbonates, and lipids, and their physical properties depending on the chemical and physical structures. In addition, governing forces (hydrogen bonding, ionic interaction, van der Waals interaction, hydrophobic interactions, etc) to assemble the basic building blocks to form nanostructures will be covered. Tools and methodologies to analyze the chemical structure of the molecules will be introduced. Quantitative analysis of the properties of biological basic building blocks will also be addressed.
II.
Case study of the molecular level structures of biological materials. This part is intended to study the examples of biological molecules to enhance understanding the assembly principle of biological materials, including collagens, keratins, spider webs, silks, bio-adhesives as protein based robust materials, bones, sea shells, diatoms, sponges, and, other biominerals as hierarchical nanostructures, and butterfly wings and insect eyes, other periodic structures for optical applications. Through the case study, we will learn how natural materials are designed to solve the challenging problem to be faced in the natural environments and exploit their design principle to develop novel functional materials and devices.
III.
Case study of the artificial nanomaterials and devices inspired by biological nature. This part is intended to enhance understanding the recently developed nanostructures and devices to mimic the natural biological materials and organisms. Hybrid functional nanomaterials and devices, such as biological basic building blocks conjugated with inorganic nanocomponents, such as quantum dots, nanowires, nanotubes will be discussed to fabricate various devices including, bio-sensor, bio-nano electronic materials and devices, bio-computing. Nano medicine and bio imaging will also be covered.
The goal is for the bioengineering students to gain sufficient chemical and physical aspects of biological materials through the case study of spider webs, silks, sea shells, diatoms, bones, and teeth, as well as recently developed self-assembled nanostructures inspired by nature.

Student Learning Outcomes: This course is intended for the undergraduate students interested in acquiring a background of recent development of bio-nanomaterials and bio-nanotechnology focused on the materials point of view. Through this course, students will understand the assembly principle of biological materials and their application in bio-nanotechnology.

Rules & Requirements

Prerequisites: BIO ENG 11 or BIOLOGY 1A; and CHEM 1A

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

UGBA 150 Leading High Impact Teams 3 Units

Terms offered: Spring 2022
This course helps students hone and develop the leadership skills needed to lead dynamic, complex, global teams. Globalization, rapid technological change, and a shift towards an innovation-based economy have resulted in more dynamic, distributed, cross-functional, as well as demographically and culturally diverse teams. Students will learn to create team developmental plans and accountability, coach teams through challenges, encourage teams to recognize and avoid bias and misattributions, and lead from a distance and across boundaries.
Leading High Impact Teams: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternate method of final assessment during regularly scheduled final exam group (e.g., presentation, final project, etc.).

Leading High Impact Teams: Read Less [-]

BIO ENG 151 Micro/Nanofluidics for Bioengineering and Lab-On-A-Chip 4 Units

Terms offered: Spring 2015, Spring 2014, Spring 2013
Introduction and in-depth treatment of theory relevant to fluid flow in microfluidic and nanofluidic systems supplemented by critical assessment of recent applications drawn from the literature. Topics include low Reynolds Number flow, mass transport including diffusion phenomena, and emphasis on electrokinetic systems and bioanalytical applications of said phenomena.
Micro/Nanofluidics for Bioengineering and Lab-On-A-Chip: Read More [+]

Objectives & Outcomes

Course Objectives: We will study mass and momentum transport phenomena of microscale and nanoscale flow devices. Throughout the course, we will place an emphasis on bioanalytical microfluidic system applications where electrophoresis, electroosmosis, molecular diffusion, and/or Brownian motion effects dominate. Successful completion of the course will prepare students to design micro/nanofluidic engineering solutions, as well as critically assess academic and industrial developments in these areas.
The course is an introduction to the physicochemical dynamics associated with fluid flow in nanoscale and microscale devices for graduate students and advance undergraduate students. The course has been created in response to the active field of microfluidics and nanofluidics, as well as the associated interest from industry, government, and academic research groups. The course provides an theoretical treatment of micro/nanofluidic phenomena that complements the well-established laboratory and research content offered in the Department.

Student Learning Outcomes: 1.
To introduce students to the governing principles of fluid flow in microfluidic and nanofluidic regimes, with emphasis on phenomena relevant to bioanalytical devices.
2.
To provide students with an understanding of scaling laws that define the performance of microfluidic and nanofluidic systems.
3.
To provide students with a detailed investigation of applications that do and do not benefit from miniaturization.
4.
To give students adequate didactic background for critical assessment of literature reports and conference presentations regarding advances in the topical areas of microfluidics and nanofluidics.

Rules & Requirements

Prerequisites: BIO ENG 11 or CHEM 3B; BIO ENG 104, MEC ENG 106, or consent of instructor

Credit Restrictions: Students will receive no credit for 151 after taking 251.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Herr

Micro/Nanofluidics for Bioengineering and Lab-On-A-Chip: Read Less [-]

UGBA 151 Management of Human Resources 3 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
The designs of systems of rewards, assessment, and manpower development. The interaction of selection, placement, training, personnel evaluation, and career ladders within an on-going organization. Role of the staff manager. Introduction of change. Implications of behavioral research for management problems and policies.
Management of Human Resources: Read More [+]
Rules & Requirements

Prerequisites: 105

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 151

Management of Human Resources: Read Less [-]

UGBA 151A People Analytics 2 Units

Terms offered: Prior to 2007
This course focuses on measuring and analyzing the costs and benefits of human capital investments by providing students with the ability to develop, analyze and use information to assess and measure employee and organizational performance. The course will show participants how to develop and make critical recommendations on such information to senior management, as well as helping to increase their presence and credibility with key decision makers. On successful completion, students will have the skills necessary to formulate both qualitative and quantitative recommendations for key management decisions affecting employees.
People Analytics: Read More [+]
Hours & Format

Fall and/or spring: 8 weeks - 4 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

People Analytics: Read Less [-]

UGBA 152 Negotiation and Conflict Resolution 3 Units

Terms offered: Summer 2022 First 6 Week Session, Spring 2022, Fall 2021
The purpose of this course is to understand the theory and processes of negotiation as practiced in a variety of settings. It is designed to be relevant to the broad spectrum of negotiation problems faced by managers and professionals. By focusing on the behavior of individuals, groups, and organizations in the context of competitive situations, the course will allow students the opportunity to develop negotiation skills experientially in useful analytical frameworks (e.g.- simulations, cases).
Negotiation and Conflict Resolution: Read More [+]
Rules & Requirements

Prerequisites: 105

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 152

Negotiation and Conflict Resolution: Read Less [-]

BIO ENG 153 Biotechnology Entrepreneurship: Impact, History, Therapeutics R&D, Entrepreneurship & Careers 2 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019
This course is designed for students interested in an introduction to the biotechnology entrepreneurship, biotherapeutics R and D, and careers in the industry. Students should be interested in the impact of biotechnology on medicine and society, the history of the field (including individual scientists, entrepreneurs and companies), key methodologies, therapeutic product classes, entrepreneurship and innovation within the life sciences.Students will learn principles of drug and biologics discovery, development and commercialization, and will be exposed to the range of careers in the biopharmaceutical industry. Students should be considering careers in the biopharmaceutical and life sciences fields.
Biotechnology Entrepreneurship: Impact, History, Therapeutics R&D, Entrepreneurship & Careers: Read More [+]

Objectives & Outcomes

Course Objectives: To educate students on biopharmaceutical company entrepreneurship and innovation through team-based hands on virtual company creation
To educate students on careers in the biopharmaceutical industry
To educate students on the history of the field and industry, including key methodologies, technologies, scientists, entrepreneurs, and companies
To foster understanding and appreciation for the medical and societal impact of the biopharmaceutical field and industry
To introduce the key steps in the process of discovery, development and commercialization of novel therapeutics

Student Learning Outcomes: Entrepreneurship principles, including those defined by the Lean Launchpad approach (including the Business Model Canvas, the Minimum Viable Product and Customer Discovery).
The history of the biotech industry
The impact of the biopharmaceutical industry on medicine and society
The methods, product technologies and development methodologies that have driven the evolution of the field
The nature of the ecosystem and specific careers in the biopharmaceutical industry
The product design and development process (with a focus on biotherapeutics), including opportunities and challenges

Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Kirn

Biotechnology Entrepreneurship: Impact, History, Therapeutics R&D, Entrepreneurship & Careers: Read Less [-]

UGBA 154 Power and Politics in Organizations 3 Units

Terms offered: Summer 2022 Second 6 Week Session, Fall 2021, Summer 2021 Second 6 Week Session
This course will provide students with a sense of "political intelligence." After taking this course, students will be able to: (1) diagnose the true distribution of power in organizations, (2) identify strategies for building sources of power, (3) develop techniques for influencing others, (4) understand the role of power in building cooperation and leading change in organizations, and (5) make sense of others' attempts to influence them. These skills are essential for effective and satisfying career building.
Power and Politics in Organizations: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 10 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Power and Politics in Organizations: Read Less [-]

UGBA 155 Leadership 3 Units

Terms offered: Summer 2022 First 6 Week Session, Summer 2021 First 6 Week Session, Fall 2020
The purpose of this course is for the students to develop understanding of the theory and practice of leadership in various organizational settings. It is designed to allow students the opportunity to develop leadership skills through experiential exercises, behavioral and self-assessments, case studies, class discussions, and lectures.
Leadership: Read More [+]

Rules & Requirements

Credit Restrictions: Students will receive no credit for UGBA 155 after completing UGBA W155. A deficient grade in UGBA 155 may be removed by taking UGBA W155.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Leadership: Read Less [-]

UGBA C155 Leadership: Purpose, Authority, and Empowerment 3 Units

Terms offered: Summer 2022 10 Week Session, Summer 2021 10 Week Session, Summer 2020 10 Week Session
The purpose of this course is for the students to develop understanding of the theory and practice of leadership in various organizational settings. It is designed to allow students the opportunity to develop leadership skills through experiential exercises, behavioral and self-assessments, case studies, class discussions, and lectures.
Leadership: Purpose, Authority, and Empowerment: Read More [+]
Rules & Requirements

Credit Restrictions: Students will receive no credit for UGBA C155 after completing UGBA W155. A deficient grade in UGBA C155 may be removed by taking UGBA W155.

Hours & Format

Summer: 10 weeks - 4.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Also listed as: UGIS C151

Leadership: Purpose, Authority, and Empowerment: Read Less [-]

UGBA W155 Leadership: Purpose, Authority, and Empowerment 3 Units

Terms offered: Prior to 2007
The purpose of this course is for the students to develop understanding of the theory and practice of leadership in various organizational settings. It is designed to allow students the opportunity to develop leadership skills through experiential exercises, behavioral and self-assessments, case studies, class discussions, and lectures.
Leadership: Purpose, Authority, and Empowerment: Read More [+]
Rules & Requirements

Credit Restrictions: Students will receive no credit for UGBA W155 after completing UGBA 155. A deficient grade in UGBA W155 may be removed by taking UGBA 155.

Hours & Format

Summer: 10 weeks - 4.5 hours of web-based lecture per week

Online: This is an online course.

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Mulhern

Leadership: Purpose, Authority, and Empowerment: Read Less [-]

UGBA 157 Special Topics in the Management of Organizations 1 - 4 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
A variety of topics in organizational behavior and industrial relations with emphasis on current problems and research.
Special Topics in the Management of Organizations: Read More [+]
Rules & Requirements

Prerequisites: 105

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer: 6 weeks - 2.5-10 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 159

Special Topics in the Management of Organizations: Read Less [-]

BIO ENG C157 Nanomaterials in Medicine 3 Units

Terms offered: Fall 2021, Fall 2020
Nanomedicine is an emerging field involving the use of nanoscale materials for therapeutic and diagnostic purposes. Nanomedicine is a highly interdisciplinary field involving chemistry, materials science, biology and medicine, and has the potential to make major impacts on healthcare in the future. This upper division course is designed for students interested in learning about current developments and future trends in nanomedicine. The overall objective of the course is to introduce major aspects of nanomedicine including the selection, design and testing of suitable nanomaterials, and key determinants of therapeutic and diagnostic efficacy. Organic, inorganic and hybrid nanomaterials will be discussed in this course.
Nanomaterials in Medicine: Read More [+]
Objectives & Outcomes

Course Objectives: To identify an existing or unmet clinical need and identify a nanomedicine that can provide a solution
To learn about chemical approaches used in nanomaterial synthesis and surface modification.
To learn how to read and critique the academic literature.
To understand the interaction of nanomaterials with proteins, cells, and biological systems.

Rules & Requirements

Prerequisites: MAT SCI 45 or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Messersmith

Also listed as: MAT SCI C157

Nanomaterials in Medicine: Read Less [-]

UGBA 159 Becoming a Changemaker 2 Units

Terms offered: Spring 2022, Fall 2021
This course inspires, trains and equips participants to convert raw energy and enthusiasm for creating a better world into real leadership skills and mindsets which will empower you to create positive change at an individual, organizational and societal level. Anchored in change leadership and bringing together the fields of entrepreneurship, innovation, leadership & social impact, the course is focused on moving from ideas to action; gaining inspiration from diverse changemakers across roles and sectors; learning how to navigate, shape and lead change to thrive amidst uncertainty; and helping you become the kind of leader our companies, our communities and our world need right now.
Becoming a Changemaker: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Becoming a Changemaker: Read Less [-]

UGBA 160 Customer Insights 3 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
Consumer behavior is the study of how consumers process information, form attitudes and judgments, and make decisions. Its study is critical to understand how consumers think and behave, which is critical for a company wishing to develop a customer focus. Given how different people are, it is amazing how similarly their minds work. Consumer psychology is the systematic study of how consumers perceive information, how they encode it in memory, integrate it with other sources of information, retrieve it from memory, and utilize it to make decisions. It is one of the building blocks of the study of marketing and provides the student with a set of tools with diverse applications.
Customer Insights: Read More [+]
Rules & Requirements

Prerequisites: 106

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Customer Insights: Read Less [-]

UGBA 161 Market Research: Tools and Techniques for Data Collection and Analysis 3 Units

Terms offered: Spring 2020, Spring 2019, Spring 2017
Information technology has allowed firms to gather and process large quantities of information about consumers' choices and reactions to marketing campaigns. However, few firms have the expertise to intelligently act on such information. This course addresses this shortcoming by teaching students how to use customer information to better market to consumers. In addition, the course addresses how information technology affects marketing strategy.
Market Research: Tools and Techniques for Data Collection and Analysis: Read More [+]

Rules & Requirements

Prerequisites: 106

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Market Research: Tools and Techniques for Data Collection and Analysis: Read Less [-]

UGBA 162 Brand Management and Strategy 3 Units

Terms offered: Spring 2022, Fall 2020, Summer 2020 First 6 Week Session
This course is an introduction to product management in marketing consumer and industrial goods and services. The course will cover analysis of market information, development of product strategy, programming strategy, and implementation.
Brand Management and Strategy: Read More [+]

Rules & Requirements

Prerequisites: 106

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 162

Brand Management and Strategy: Read Less [-]

UGBA 162A Product Branding and Branded Entertainment 2 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
As consumers demand information and products tailored specifically to their individual needs, brands strive to create alternative advertising methods to build lasting relationships and retain “top of mind” status. Smart consumers, especially those in niche markets, have dismissed traditional avenues of sponsorship and product placement. Course explores how and why brand executives across multiple industries are leveraging entertainment to connect with niche markets. It educates students about how marketers develop creative and entertaining ways to connect with multi-hyphenate customers. Course culminates in a Creative Pitch, based on a case study, and a Client Presentation where students present marketing campaigns to industry executives.
Product Branding and Branded Entertainment: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Summer: 6 weeks - 5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Product Branding and Branded Entertainment: Read Less [-]

BIO ENG 163 Principles of Molecular and Cellular Biophotonics 4 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016
This course provides undergraduate and graduate bioengineering students with an opportunity to increase their knowledge of topics in the emerging field of biophotonics with an emphasis on fluorescence spectroscopy, biosensors and devices for optical imaging and detection of biomolecules. This course will cover the photophysics and photochemistry of organic molecules, the design and characterization of biosensors and their applications within diverse environments.
Principles of Molecular and Cellular Biophotonics: Read More [+]

Rules & Requirements

Prerequisites: CHEM 3A and PHYSICS 7B; and BIO ENG 102 or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Marriott

Principles of Molecular and Cellular Biophotonics: Read Less [-]

BIO ENG 163L Molecular and Cellular Biophotonics Laboratory 4 Units

Terms offered: Spring 2022, Spring 2020, Spring 2019
This course provides undergraduate and graduate bioengineering students with an opportunity to acquire essential experimental skills in fluorescence spectroscopy and the design, evaluation, and optimization of optical biosensors for quantitative measurements of proteins and their targets. Groups of students will be responsible for the research, design, and development of a biosensor or diagnostic device for the detection, diagnosis, and monitoring of a specific biomarker(s).
Molecular and Cellular Biophotonics Laboratory: Read More [+]
Rules & Requirements

Prerequisites: BIO ENG 163 (may be taken concurrently)

Credit Restrictions: Students will receive no credit for Bioengineering 163L after taking Bioengineering 263L.

Hours & Format

Fall and/or spring: 15 weeks - 6 hours of laboratory and 2 hours of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Marriott

Molecular and Cellular Biophotonics Laboratory: Read Less [-]

BIO ENG 164 Optics and Microscopy 4 Units

Terms offered: Fall 2010, Fall 2009, Fall 2008
This course teaches fundamental principles of optics and examines contemporary methods of optical microscopy for cells and molecules. Students will learn how to design simple optical systems, calculate system performance, and apply imaging techniques including transmission, reflection, phase, and fluorescence microscopy to investigate biological samples. The capabilities of optical microscopy will be compared with complementary techniques including electron microscopy, coherence tomography, and atomic force microscopy. Students will also be responsible for researching their final project outside of class and presenting a specific application of modern microscopy to biological research as part of an end-of-semester project.
Optics and Microscopy: Read More [+]
Rules & Requirements

Prerequisites: PHYSICS 7A and PHYSICS 7B; or PHYSICS 8A and PHYSICS 8B

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Fletcher

Optics and Microscopy: Read Less [-]

UGBA 164 Marketing Strategy 3 Units

Terms offered: Spring 2020, Fall 2019, Spring 2019
This course specifically addresses how to deal with competition. Additionally, marketing managers usually have to make decisions with incomplete or unreliable information. In “Marketing Strategy” students learn how firms develop plans that can be updated in light of changing circumstances. The course covers the following topics: Market size estimation; Competitor identification and analysis; Internal analysis; Alternative business models; Risk identification, assessment and management using scenario planning; Handling unknown futures using sensitivity analysis; Price setting dynamics; Competitive tactics. The course utilizes a combination of lectures and cases. There are group presentations (self-selected teams) and some group projects.
Marketing Strategy: Read More [+]
Rules & Requirements

Prerequisites: 106

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Marketing Strategy: Read Less [-]

UGBA 165 Advertising Strategy 3 Units

Terms offered: Summer 2022 First 6 Week Session, Summer 2021 First 6 Week Session, Summer 2020 First 6 Week Session
Basic concepts and functions of advertising in the economy; consumer motivation; problems in utilizing advertising and measuring its effectiveness.
Advertising Strategy: Read More [+]
Rules & Requirements

Prerequisites: 106

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 165

Advertising Strategy: Read Less [-]

BIO ENG C165 Medical Imaging Signals and Systems 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
Biomedical imaging is a clinically important application of engineering, applied mathematics, physics, and medicine. In this course, we apply linear systems theory and basic physics to analyze X-ray imaging, computerized tomography, nuclear medicine, and MRI. We cover the basic physics and instrumentation that characterizes medical image as an ideal perfect-resolution image blurred by an impulse response. This material could prepare the student for a career in designing new medical imaging systems that reliably detect small tumors or infarcts.
Medical Imaging Signals and Systems: Read More [+]
Rules & Requirements

Prerequisites: Prerequisites are introductory level skills in Python/ Matlab; and either EECS 16A, EECS 16B, and EL ENG 120; or MATH 54, BIO ENG 105, and BIO ENG 101

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Conolly

Also listed as: EL ENG C145B

Medical Imaging Signals and Systems: Read Less [-]

BIO ENG 166 Biomedical Imaging Systems II: Targeted Molecular Imaging in Disease 4 Units

Terms offered: Spring 2022, Spring 2021
This course is designed as an introduction to the growing world of molecular imaging in medicine and research. The course is divided into five modules based on common imaging modalities (optical imaging, ultrasound methods, radiography, nuclear imaging, and magnetic resonance approaches). Within each module the fundamental physics and engineering behind each modality, corresponding methods for targeted molecular imaging including contrast mechanisms and probe design, and signal and image processing algorithms are covered. Homework assignments will utilize imaging data from either clinical or research studies in order to provide training in MATLAB based image analysis techniques.
Biomedical Imaging Systems II: Targeted Molecular Imaging in Disease: Read More [+]
Objectives & Outcomes

Course Objectives: Discuss limitations to each targeted approach including non-specific binding, unbound probe clearance, signal decay, etc.
Discuss the design of targeted molecular contrast agents for each modality across myriad biological applications
Establish a foundational understanding of MRI (multi-spectral), PET/SPECT, Ultrasound (including photo-acoustic imaging), and emerging methods including MPI
Establish proficiency in the use of MATLAB as a tool for analyzing biomedical imaging data
Reinforce mathematical principles relevant to image analysis including linear algebra, convolution and differential equations
To discuss imaging ethics in the context of data interpretation
To expose students interested in biomedical research or clinical practice to fundamentals of modern imaging methods and interpretation
To learn quantitative approaches to analyze biomedical images (includes pharmacokinetic models, attenuation correction, cross modality registration, etc.)

Student Learning Outcomes: Analyze imaging data derived from imaging studies using commonly utilized image processing techniques
Critically evaluate scientific publications in the molecular imaging space.

Understand the devices, techniques and protocols used for in vivo imaging in research and clinical settings

Rules & Requirements

Prerequisites: BIO ENG C165 or BIO ENG 163; and BIO ENG 101 plus BIO ENG 105 or EECS 16A plus EECS 16B

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Vandsburger

Biomedical Imaging Systems II: Targeted Molecular Imaging in Disease: Read Less [-]

UGBA 167 Special Topics in Marketing 1 - 4 Units

Terms offered: Spring 2022, Spring 2020, Fall 2019
A variety of topics in marketing with emphasis on current problems and research.
Special Topics in Marketing: Read More [+]
Rules & Requirements

Prerequisites: 106

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer:
6 weeks - 2.5-10 hours of lecture per week
8 weeks - 4-6 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 169

Special Topics in Marketing: Read Less [-]

BIO ENG 168L Practical Light Microscopy 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2017
This laboratory course is designed for students interested in obtaining practical hands-on training in optical imaging and instrumentation. Using a combination of lenses, cameras, and data acquisition equipment, students will construct simple light microscopes that introduce basic concepts and limitations important in biomedical optical imaging. Topics include compound microscopes, Kohler illumination, Rayleigh two-point resolution, image contrast including dark-field and fluorescence microscopy, and specialized techniques such as fluorescence recovery after photobleaching (FRAP). Intended for students in both engineering and the sciences, this course will emphasize applied aspects of optical imaging and provide a base of practical skill and reference material that students can leverage in their own research or in industry.
Practical Light Microscopy: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Fletcher

Practical Light Microscopy: Read Less [-]

UGBA 169 Pricing 3 Units

Terms offered: Spring 2022, Spring 2021, Fall 2019
This three-module course aims to equip students with proven concepts, techniques, and frameworks for assessing and formulating pricing strategies. The first module develops the economics and behavorial foundations of pricing. The second module discusses several innovative pricing concepts including price customization, nonlinear pricing, price matching, and product line pricing. The third module analyzes the strengths and weaknesses of several Internet-based, buyer-determined pricing models.
Pricing: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Pricing: Read Less [-]

BIO ENG 171 Interface Between Neuroethology & Neural Engineering 3 Units

Terms offered: Spring 2021
The course will provide students with an overview of the tight interface between neural engineering and neuroethological approaches in the field of neuroscience. This course will also discuss the concepts of causal manipulations, such as the control of brain circuits using optics and genetic engineering. Lastly, students will also inquire and discuss what discoveries have yet to be made and how neuroethological approaches can inform neural engineering designs that will revolutionize the future of neural medicine.
Interface Between Neuroethology & Neural Engineering: Read More [+]
Objectives & Outcomes

Course Objectives: Understand the close interface between studies of the nervous system and technology

Student Learning Outcomes: The course will review the utilization, development and implementation of a wide diversity of neural engineering technologies to the study of the brain. Students will discuss the bidirectional road between the two approaches.
The overreaching goal of this course is to expose student interested in neural engineering to the remarkable history of neuroethological approaches that have been a foundation of discoveries in the field.

Rules & Requirements

Prerequisites: BIO ENG 105; and BIO ENG 101 or EECS 16A and EECS 16B; or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Yartsev

Interface Between Neuroethology & Neural Engineering: Read Less [-]

UGBA 171 Tech and the City: How to Get Urban Innovation Right 3 Units

Terms offered: Spring 2022
This course critically examines how new technologies and business models impact cities, and identifies the approaches that produce not only the best business outcomes, but also the most equitable and sustainable outcomes. To begin, we explore what makes cities such compelling laboratories for technology innovation, learn from past attempts at “smart city” interventions, and discuss how technologists can identify more effective solutions to today’s urban challenges. We’ll then hear from a variety of cutting edge practitioners, including venture investors, startup founders, government officials, tech journalists and community organizers about the unique opportunities and challenges of building an urban tech startup today.
Tech and the City: How to Get Urban Innovation Right: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Tech and the City: How to Get Urban Innovation Right: Read Less [-]

UGBA C172 History of American Business 3 Units

Terms offered: Spring 2022, Spring 2021, Spring 2019
This course will examine selected aspects of the history of American business. Included will be discussions of the evolution of the large corporation, the development of modern managerial techniques, and the changing relationship of business, government, and labor.
History of American Business: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Rosen

Formerly known as: American Studies C172, Business Administration C172

Also listed as: AMERSTD C172

History of American Business: Read Less [-]

UGBA 173 Competitive Strategy 3 Units

Terms offered: Fall 2021
This course draws upon theories and frameworks from industrial organization economics, game theory, and resource-based views to address the unique challenges confronted by senior executives of organizations. The focus is strategies for competitive advantage at an organizational level. Topics include industry and competitor analysis, horizontal and vertical boundaries of the firm, strategic positioning, internal competencies, and dynamic capabilities.
Competitive Strategy: Read More [+]
Rules & Requirements

Prerequisites: 101A or equivalent

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer:
3 weeks - 15 hours of lecture per week
6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructor: Metzler

Formerly known as: Undergrad. Business Administration 115

Competitive Strategy: Read Less [-]

UGBA 174 Leading Strategy Implementation 3 Units

Terms offered: Fall 2021
Class format consists of lectures, experiential exercises, student presentations, and case discussions. This course will cover the concepts and techniques required for successful implementation of business strategies with a particular focus on the role of effective leadership in leading strategic change.
Leading Strategy Implementation: Read More [+]
Rules & Requirements

Credit Restrictions: Students will receive no credit for UGBA 174 after completing BUS ADM 190.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 10 weeks - 4.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Formerly known as: Undergrad. Business Administration 119

Leading Strategy Implementation: Read Less [-]

UGBA 175 Legal Aspects of Management 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
An analysis of the law and the legal process, emphasizing the nature and functions of law within the U.S. federal system, followed by a discussion of the legal problems pertaining to contracts and related topics, business association, and the impact of law on economic enterprise.
Legal Aspects of Management: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 175

Legal Aspects of Management: Read Less [-]

UGBA 176 Innovations in Communications and Public Relations 2 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
This course introduces students to public relations and how it is used by companies, non-profits and individuals to build and support their brands through innovative communication techniques. Students will hear from and have direct access to entrepreneurs and established executives who share insights on how they've used creative public relations campaigns and communications skills to create attention and value for their brand or avoid it in a crisis. They also learn to work in teams crafting effective media responses for an existing company needing real help now (not a case study). The semester ends with each student applying this technique to create their own personal brand that they can refine as they prepare to move into the workforce.
Innovations in Communications and Public Relations: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Summer: 6 weeks - 5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Innovations in Communications and Public Relations: Read Less [-]

UGBA 177 Special Topics in Business and Public Policy 1 - 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020
A variety of topics in business and public policy with emphasis on current problems and research.
Special Topics in Business and Public Policy: Read More [+]
Rules & Requirements

Prerequisites: 107

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer: 6 weeks - 2.5-10 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 179

Special Topics in Business and Public Policy: Read Less [-]

UGBA 178 Introduction to International Business 3 Units

Terms offered: Summer 2022 Second 6 Week Session, Fall 2021, Summer 2021 Second 6 Week Session
A survey involving environmental, economic, political, and social constraints on doing business abroad; effects of overseas business investments on domestic and foreign economies; foreign market analysis and operational strategy of a firm; management problems and development potential of international operations.
Introduction to International Business: Read More [+]
Rules & Requirements

Prerequisites: Undergraduate Business Administration 101A-101B or equivalents

Credit Restrictions: Students will receive no credit for Undergraduate Business Administration 178 after completing Business Administration 188. A deficient grade in Business Administration 188 may be removed by taking Undergraduate Business Administration 178.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Introduction to International Business: Read Less [-]

UGBA 179 International Consulting for Small and Medium-Sized Enterprises 3 Units

Terms offered: Fall 2021, Fall 2020, Spring 2020
By exploring the intersection of global business, entrepreneurship, and consulting, this course provides an understanding of how decision-makers in small and medium sized enterprises (SMEs) can develop the frameworks necessary for making decisions about how to venture across borders in pursuit of economic opportunities in today's hypercompetitive global business environment. In addition to the technical analysis of cases, there is a strong emphasis on how to create a new service company, market and sell to potential clients, manage client relationships, and leverage financial and human resources in a service setting.
International Consulting for Small and Medium-Sized Enterprises: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

International Consulting for Small and Medium-Sized Enterprises: Read Less [-]

UGBA 180 Introduction to Real Estate and Urban Land Economics 3 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
The nature of real property; market analysis; construction cycles; mortgage lending; equity investment; metropolitan growth; urban land use; real property valuation; public policies.
Introduction to Real Estate and Urban Land Economics: Read More [+]

Rules & Requirements

Prerequisites: Economics 1, Mathematics 16A or 1A, or equivalents

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 180

Introduction to Real Estate and Urban Land Economics: Read Less [-]

BIO ENG C181 The Berkeley Lectures on Energy: Energy from Biomass 3 Units

Terms offered: Fall 2015, Fall 2014, Fall 2013
After an introduction to the different aspects of our global energy consumption, the course will focus on the role of biomass. The course will illustrate how the global scale of energy guides the biomass research. Emphasis will be placed on the integration of the biological aspects (crop selection, harvesting, storage and distribution, and chemical composition of biomass) with the chemical aspects to convert biomass to energy. The course aims to engage students in state-of-the-art research.
The Berkeley Lectures on Energy: Energy from Biomass: Read More [+]

Rules & Requirements

Prerequisites: Chemistry 1B or Chemistry 4B, Mathematics 1B, Biology 1A

Repeat rules: Course may be repeated for credit under special circumstances: Repeatable when topic changes with consent of instructor.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Bell, Blanch, Clark, Smit, C. Somerville

Also listed as: CHEM C138/CHM ENG C195A/PLANTBI C124

The Berkeley Lectures on Energy: Energy from Biomass: Read Less [-]

UGBA 183 Introduction to Real Estate Finance 3 Units

Terms offered: Spring 2020, Spring 2019, Spring 2018
Real estate debt and equity financing; mortgage market structure; effects of credit on demand; equity investment criteria; public policies in real estate finance and urban development.
Introduction to Real Estate Finance: Read More [+]

Rules & Requirements

Prerequisites: 180

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 183

Introduction to Real Estate Finance: Read Less [-]

UGBA 184 Urban and Real Estate Economics 3 Units

Terms offered: Spring 2016, Spring 2015, Spring 2014
This course examines how market forces influence the development of cities and the development and pricing of real estate assets. Topics include city formation; city size; land rent and land use; the operation of residential, commerical and industrial property markets; and the impacts of government policies, including the provision of public services, the imposition property taxes and fees, transportation pricing and investment, and land use regulations.
Urban and Real Estate Economics: Read More [+]
Rules & Requirements

Prerequisites: A background in microeconomics and basic calculus is preferable. Please contact the instructor if you are unsure about your preparation for this course

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Urban and Real Estate Economics: Read Less [-]

UGBA 187 Special Topics in Real Estate Economics and Finance 1 - 4 Units

Terms offered: Fall 2010, Fall 2009
A variety of topics in real estate economics and finance with emphasis on current problems and research.
Special Topics in Real Estate Economics and Finance: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer: 6 weeks - 2.5-10 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Special Topics in Real Estate Economics and Finance: Read Less [-]

BIO ENG 190 Special Topics in Bioengineering 1 - 4 Units

Terms offered: Spring 2022, Fall 2021, Spring 2020
This course covers current topics of research interest in bioengineering. The course content may vary from semester to semester.
Special Topics in Bioengineering: Read More [+]
Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Special Topics in Bioengineering: Read Less [-]

UGBA 190C Collaborative Innovation 4 Units

Terms offered: Spring 2022, Spring 2020
This is a project-based course in collaborative innovation where students experience group creativity and team-based design by using techniques from across the disciplines of business, theater, design, and art practice. Students will leverage problem framing and solving techniques derived from critical thinking, systems thinking, and creative problem solving (popularly known today as design thinking). The course is grounded in a brief weekly lecture that sets out the theoretical, historical, and cultural contexts for particular innovation practices, but the majority of the class involves hands-on studio-based learning guided by an interdisciplinary team of teachers leading small group collaborative projects.
Collaborative Innovation: Read More [+]
Rules & Requirements

Credit Restrictions: Students will receive no credit for UGBA 190C after completing ART 100, or THEATER 100. A deficient grade in UGBA 190C may be removed by taking ART 100, or THEATER 100.

Hours & Format

Fall and/or spring: 15 weeks - 6 hours of studio per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Beckman

Collaborative Innovation: Read Less [-]

UGBA 190D Innovation and Design Thinking in Business 2 Units

Terms offered: Spring 2022, Fall 2021, Fall 2020
The goal of this course is to equip students with innovation skills and practices. This is a learn-by-doing lab. Students learn research methods, ethnography, analysis and synthesis, reflective thinking, scenario creation, ideation processes, rapid prototyping cycles and designing experiments, iterative design and how to tell the story of “Never Before Seen” ideas. Class time is spent using hands-on innovation and human-centered design practices. Teams present work for critique and iterative development. The course features short lectures, guest talks, campus-based fieldwork, site visits, research and readings. Projects will be launched in the sessions and each team will be coached and mentored.
Innovation and Design Thinking in Business: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Innovation and Design Thinking in Business: Read Less [-]

UGBA 190S Strategy for the Information Technology Firm 2 - 3 Units

Terms offered: Prior to 2007
This course is a strategy and general management course for students interested in pursuing careers in the global information technology industry. Students are taught to view the IT industry through the eyes of the general manager/CEO (whether at a start-up or an industry giant). They learn how to evaluate strategic options and their consequences, how to understand the perspectives of various industry players, and how to anticipate how they are likely to behave under various circumstances. These include the changing economics of production, the role network effects and standards have on adoption of new products and services, the tradeoffs among potential pricing strategies, and the regulatory and public policy context.
Strategy for the Information Technology Firm: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2-3 hours of lecture per week

Summer: 8 weeks - 4-6 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Strategy for the Information Technology Firm: Read Less [-]

UGBA 190T Special Topics in Innovation and Design 1 - 4 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
Advanced study in the fields of innovation and design that will address current and emerging issues. Topics will vary with each offering and will be announced at the beginning of each term.
Special Topics in Innovation and Design: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer:
6 weeks - 2.5-10 hours of lecture per week
8 weeks - 2-7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Special Topics in Innovation and Design: Read Less [-]

UGBA 191C Communication for Leaders 2 Units

Terms offered: Fall 2016, Summer 2016 10 Week Session, Summer 2016 Second 6 Week Session
This course is a workshop in the fundamentals of public speaking skills in today's business environment. Each student will give speeches, coach, and debate each other, and take part in a variety of listening and other communication exercises. The course focuses on authenticity, persuasion, and advocacy.
Communication for Leaders: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture and 2 hours of discussion per week

Summer:
6 weeks - 2.5 hours of lecture and 5 hours of discussion per week
8 weeks - 1.5 hours of lecture and 3.5 hours of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Communication for Leaders: Read Less [-]

UGBA 191I Improvisational Leadership 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
This class explores the broad principles of improvisation, a performing art form that has developed pedagogical methods to enhance individual spontaneity, listening and awareness, expressive skills, risk-taking, and one's ability to make authentic social and emotional connections. The ultimate aim of the course is to help students develop an innovative and improvisational leadership mindset, sharpening in-the-moment decision making and the ability to quickly recognize and act upon opportunities when presented. In practical terms, this course strives to enhance students' business communication skills and increase both interpersonal intuition and confidence.
Improvisational Leadership: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Improvisational Leadership: Read Less [-]

UGBA 191L Leadership Communication 1 Unit

Terms offered: Spring 2020, Fall 2019
Leadership Communication is a workshop in the fundamentals of public speaking in today's business environment. Through prepared and impromptu speeches aimed at moving others to action, peer coaching, and lectures, students will sharpen their authentic and persuasive communication skills, develop critical listening skills, improve abilities to give, receive, and apply feedback, and gain confidence as public speakers.
Leadership Communication: Read More [+]
Hours & Format

Fall and/or spring: 2 weeks - 8 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Alternative to final exam.

Leadership Communication: Read Less [-]

UGBA 191P Leadership and Personal Development 3 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
This course is highly interactive and challenges you to explore questions central to your own leadership journey. The ultimate aim of the class is to help you develop a lifelong leadership development practice, where continuous personal growth is valued and actively pursued.
Leadership and Personal Development: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Leadership and Personal Development: Read Less [-]

BIO ENG 192 Senior Design Projects 5 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
This semester-long course introduces students to bioengineering project-based learning in small teams, with a strong emphasis on need-based solutions for real medical and research problems through prototype solution selection, design, and testing. The course is designed to provide a "capstone" design experience for bioengineering seniors. The course is structured around didactic lectures and a textbook, from which assigned readings will be drawn, and supplemented by additional handouts, readings, and lecture material.
Senior Design Projects: Read More [+]
Rules & Requirements

Prerequisites: Senior standing

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructor: Herr

Senior Design Projects: Read Less [-]

UGBA 192A Leading Nonprofit and Social Enterprises 3 Units

Terms offered: Spring 2022, Spring 2020, Spring 2019
This course prepares students conceptually and practically to found, lead, and manage organizations in the nonprofit sector. The course focuses on mission and theory of change (strategy), role of the board in governance, managing and marketing to multiple constituencies, role of advocacy in meeting mission, leadership styles and managing organizational culture, resource development (philanthropy), nonprofit financial management, managing for impact, HR management (volunteering), and cross-sector alliances.
Leading Nonprofit and Social Enterprises: Read More [+]
Rules & Requirements

Prerequisites: 101A or equivalent

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Formerly known as: Business Administration 115

Leading Nonprofit and Social Enterprises: Read Less [-]

UGBA 192AC Social Movements and Social Media 3 Units

Terms offered: Spring 2020, Spring 2019, Fall 2017
This course provides a survey of innovative social movements and their complex relationships to social media technologies. It will examine the evolution from pre-social-media to present-day mobilizing strategies and the interplay between explicitly policy- and advocacy-focused approaches and related efforts rooted in music, visual arts, popular culture and celebrities. The course will place into comparative relief the discourses of explicitly racially- or ethnically-defined movements and movements that mobilize based on other, sometimes overlapping categories of marginalization including class, immigration status, gender identity and occupational category.
Social Movements and Social Media: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructor: David Harris

Social Movements and Social Media: Read Less [-]

UGBA 192B Strategic Philanthropy 2 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
This course teaches students the concepts and practices of effective philanthropy. It offers students the experience of studying relevant theories and frameworks for assessing potential grant recipients and a real-world grant making experience in which they complete a series of nonprofit organizational assessments and then make actual grants totaling $10,000 to a limited number of organizations. Students learn about the evolution of the philanthropic sector from traditional entities, such as private, corporate and community foundations, to an array of new funding intermediaries, technology-driven philanthropies, open source platforms, “impact” investors, and venture philanthropy partnerships.
Strategic Philanthropy: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Strategic Philanthropy: Read Less [-]

UGBA 192E Social Entrepreneurship 2 Units

Terms offered: Fall 2021, Fall 2019
This course is designed to provide broad exposure to the theories and activities of social entrepreneurship. The inquiry is grounded in real-world examples that illustrate the topics and stimulate thinking, discussion, and learning. Working in groups, students develop a business plan or pitch deck for a social enterprise that addresses an issue that is of interest/ concern to the student team. Students with preexisting social enterprise ideas or plans that they would like to further develop and refine are welcomed and encouraged to use this class project as an opportunity to do so.
Social Entrepreneurship: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Social Entrepreneurship: Read Less [-]

UGBA 192G Strategic Approaches for Global Social Impact 2 Units

Terms offered: Prior to 2007

The main objective of this course is to help students become effective practitioners in global development and understand career options in the global social sector. The course aims to (i) analyze the historical, sociological and statistical underpinnings of the major issues in global development (conflict, food security, human rights, poverty, health and education), (ii) understand what various organizations can contribute to each issue (government agencies, multilateral institutions, private foundations, NGOs, and private sector companies and entrepreneurs), and (iii) design and analyze approaches to addressing these issues.

Strategic Approaches for Global Social Impact: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Strategic Approaches for Global Social Impact: Read Less [-]

UGBA 192H Managing Human Rights in Business 2 Units

Terms offered: Spring 2021

This course, one of the first of its kind offered at a business school, will prepare students for the growing field of practice at the intersection of business and human rights. Students will gain an overview of the international human rights framework and global business and human rights standards and guidelines; analyze the ways in which companies can impact human rights, and to assess the degree to which companies are and should be responsible for human rights impacts; learn to manage a company's human rights impacts as corporate human rights managers, external consultants, or civil society advocates; and practice the communication skills necessary to successfully address human rights issues within a complex multinational corporation.

Managing Human Rights in Business: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Managing Human Rights in Business: Read Less [-]

UGBA 192ID Impact Startup Disco 1 Unit

Terms offered: Spring 2022

This is a high-octane, single weekend course (plus one intro day) for students interested in meeting other innovators and getting hands-on experience developing a new impact startup concept. All "social and environmental" impact themes are welcome. The course is inspired by other "hackathon" and startup weekend formats. A structured roadmap helps guide students through a sprint formation and ideation process. All students will be asked to submit an idea during the week prior to the class. After a peer vote selects the top ideas, teams are organically formed during the first session. At the end of the course, each team will present their validated concept and their next steps plan to a panel of impact venture experts.

Impact Startup Disco: Read More [+]

Hours & Format

Fall and/or spring: 1 weeks - 15 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Impact Startup Disco: Read Less [-]

UGBA 192L Applied Impact Evaluation 2 Units

Terms offered: Prior to 2007

This course covers the methods and applications of impact evaluations, which is the science of measuring the causal impact of a program or policy on outcomes of interest. At its essence, impact evaluation is about generating evidence on which policies work, and which don't. This subject matter should appeal to three main audiences: (1) those in decision-making positions, such as policy makers and business leaders, and need to consume the information generated from impact evaluations to make informed evidence-based decisions, (2) project managers, development practitioners and business managers who commission impact evaluations and (3) researchers who actually design and implement impact evaluations.

Applied Impact Evaluation: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Applied Impact Evaluation: Read Less [-]

UGBA 192MC Management Consulting Skills for Social Impact 2 Units

Terms offered: Fall 2021
This course provides a basic understanding of what consultants do and how they do it, and how consulting skills can be applied to thorny problems of social impact. Students will: 1) gain a broad understanding of the management consulting industry, the various consulting models, and how consultants can generate value for their clients in the social sector; 2) learn and practice structured approaches to problem solving used by leading management consultancies; and 3) understand other skills required in management consulting for social impact – such as communicating persuasively and managing projects and client relationships – as well as some of the ethical issues that consultants often face working in the social sector.
Management Consulting Skills for Social Impact: Read More [+]
Hours & Format

Fall and/or spring:
12 weeks - 2.5 hours of lecture per week
15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternate method of final assessment during regularly scheduled final exam group (e.g., presentation, final project, etc.).

Management Consulting Skills for Social Impact: Read Less [-]

UGBA 192N Topics in Social Sector Leadership 1 - 5 Units

Terms offered: Spring 2022, Fall 2019, Spring 2019
Advanced study in the field of social sector leadership that will address current and emerging issues. Topics will vary with each offering and will be announced at the beginning of each term.
Topics in Social Sector Leadership: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-5 hours of lecture per week

Summer: 6 weeks - 2.5-12.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Topics in Social Sector Leadership: Read Less [-]

UGBA 192P Sustainable Business Consulting Projects 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2018
Discuss the field of strategic corporate social responsibility (CSR) through a series of lectures, guest speakers, and projects. The course will examine best practices used by companies to engage in socially responsible business practices. It will provide students with a flavor of the complex dilemmas one can face in business in trying to do both "good for society" and "well for shareholders." It looks at CSR from a corporation perspective, and how this supports core business objectives, core competencies, and bottom-line profits.
Sustainable Business Consulting Projects: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Sustainable Business Consulting Projects: Read Less [-]

UGBA 192S Business and Sustainability 2 Units

Terms offered: Summer 2022 First 6 Week Session, Summer 2021 First 6 Week Session, Summer 2020 First 6 Week Session
This course—a mixture of lectures, readings, business cases and corporate speakers—uses theory, frameworks, tools and business cases to teach students how to systematically evaluate and implement sustainability strategies that also maintain or maximize financial returns. Students are taught to identify opportunities to create business value from environmental and social challenges, and to evaluate the competitive implications related to sustainability initiatives. What type of long-term strategies can organizations set to simultaneously foster sustainable development strategy and sound financial practice? How should decision makers make trade-offs between these two organizational objectives? When is “sustainability” also “good business”?
Business and Sustainability: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Summer: 6 weeks - 5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Business and Sustainability: Read Less [-]

UGBA 192T Topics in Responsible Business 1 - 4 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
Advanced study in the field of corporate social responsibility that will address current and emerging issues. Topics will vary with each offering and will be announced at the beginning of each term.
Topics in Responsible Business: Read More [+]

Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer:
6 weeks - 2.5-10 hours of lecture per week
8 weeks - 2-8 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Topics in Responsible Business: Read Less [-]

UGBA C192R Business, Sustainability, and Society 3 Units

Terms offered: Summer 2022 8 Week Session, Summer 2021 8 Week Session
As corporations have grown in influence, concerns over their impact on people and the planet have also grown, pushing sustainability, corporate social responsibility, and the wider impact of business into the spotlight. This course focuses on business ethics, supply chains, resource constraints, labor issues, innovation, and environmental externalities, as well as the internal challenges, competitive pressures, external stakeholders, and other issues that businesses must consider while trying to act responsibly.
Business, Sustainability, and Society: Read More [+]

Hours & Format

Summer: 8 weeks - 6 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required, with common exam group.

Instructor: Rochlin

Also listed as: ENE,RES C192

Business, Sustainability, and Society: Read Less [-]

UGBA 193B Energy & Civilization 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019
Energy is one of the main drivers of civilization. Today we are at the precipice of what many hope will be a major paradigm shift in energy production and use. Two transitions are needed. On the one hand, we must find ways to extend the benefits of our existing energy system to the impoverished people living in the developing world while continuing to provide these benefits to the people of the developed world. On the other hand, we must completely overhaul the existing system to fight climate change and other forms of air and water pollution. Are these shifts truly within our reach? Can we achieve both simultaneously? If so, how? This Big Ideas course will grapple with these questions using an interdisciplinary systems approach.
Energy & Civilization: Read More [+]

Rules & Requirements

Credit Restrictions: Students will receive no credit for UGBA 193B after completing L & S 126. A deficient grade in UGBA 193B may be removed by taking L & S 126.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Energy & Civilization: Read Less [-]

UGBA 193C Practical Training 0.5 Units

Terms offered: Summer 2014 10 Week Session, Summer 2013 10 Week Session, Summer 2012 10 Week Session
A structured reflective experience on the applied aspects of Business Administration in a professional off-campus environment. The self-selected experience from a CPT employer is designed to provide students with opportunities to make connections between the theory and practice of academic study and the practical application of that study in a real world setting. This applied course is intended for students to enhance their academics through their experience with the experiential learning activity of their choice.
Practical Training: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction. Students may enroll in multiple sections of this course within the same semester.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of internship per week

Summer: 6 weeks - 0 hours of internship per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Alternative to final exam.

Practical Training: Read Less [-]

UGBA 193I Business Abroad 4 - 6 Units

Terms offered: Summer 2019 8 Week Session, Summer 2018 Second 6 Week Session, Summer 2017 Second 6 Week Session
This course includes both formal learning in lectures, experiential learning, and action research through site visits abroad. Students and instructor will visit with international companies and/or organizations to learn about the business opportunities and challenges of operating in a specific country or region. Evaluation is based on student participation, presentations, and a research paper. Country and business industry focus may vary from term to term depending upon the instructor.
Business Abroad: Read More [+]
Rules & Requirements

Prerequisites: To be determined by instructor depending on topic

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 4-6 hours of lecture per week

Summer: 5 weeks - 16-25 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Business Abroad: Read Less [-]

UGBA 194 Undergraduate Colloquium on Business Topics 1 Unit

Terms offered: Spring 2022, Spring 2021, Spring 2020
This is a speakers series course designed to give students insights from practitioners into complex issues facing American business leaders. Each week a guest speaker will discuss an issue related to a particular theme, ranging from corporate governance to the social responsibilities of business. Students will be challenged to synthesize, question, and extend those insights under the guidance of the instructor.
Undergraduate Colloquium on Business Topics: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture per week

Summer: 6 weeks - 2.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam required.

Undergraduate Colloquium on Business Topics: Read Less [-]

BIO ENG H194 Honors Undergraduate Research 3 or 4 Units

Terms offered: Fall 2019, Fall 2018, Spring 2016
Supervised research. Students who have completed 3 or more upper division courses may pursue original research under the direction of one of the members of the staff. May be taken a second time for credit only. A final report or presentation is required. A maximum of 4 units of this course may be used to fulfill the research or technical elective requirement or in the Bioengineering program.
Honors Undergraduate Research: Read More [+]
Rules & Requirements

Prerequisites: Upper division technical GPA 3.3 or higher and consent of instructor and adviser

Repeat rules: Course may be repeated for credit up to a total of 8 units.

Hours & Format

Fall and/or spring: 15 weeks - 3-4 hours of independent study per week

Summer:
8 weeks - 1.5-7.5 hours of independent study per week
10 weeks - 1.5-9 hours of independent study per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Honors Undergraduate Research: Read Less [-]

BIO ENG 195 Bioengineering Department Seminar 1 Unit

Terms offered: Prior to 2007
This weekly seminar series invites speakers from the bioengineering community, as well as those in related fields, to share their work with our department and other interested parties on the Berkeley campus. The series includes our annual Bioengineering Distinguished Lecture and Rising Star lecture.
Bioengineering Department Seminar: Read More [+]
Objectives & Outcomes

Course Objectives: •
To introduce students to bioengineering research as it is performed at Berkeley and at other institutions
•
To give students opportunities to connect their own work to work in the field overall
•
To give students an opportunity to meet with speakers who can inform and contribute to their post-graduation career paths

Student Learning Outcomes: To introduce students to the breadth of bioengineering research, both here at Berkeley and at other institutions, and help them to connect their work here at Berkeley to the field overall.

Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Instructor: Faculty

Bioengineering Department Seminar: Read Less [-]

UGBA 195A Entrepreneurship 3 Units

Terms offered: Spring 2020, Fall 2019, Spring 2019
Do you have an idea for a new business, but want to learn how to more fully develop this idea? Would you like to receive funding for your business idea, but lack a framework to ask for capital? This course takes students through the new venture process using a business plan as the main deliverable. A well-written business plan sets key milestones and indicates the resources needed to achieve them, in an increasingly complex business environment. Through the planning process that tightly links market and financial planning a business plan creates a set of standards to which investors and teammates can evaluate actual performance, laying the foundation for an “operating plan” once the business is launched.
Entrepreneurship: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Entrepreneurship: Read Less [-]

UGBA 195B Startup and Small-Business Consulting 2 Units

Terms offered: Fall 2021
This course is designed to provide students with an understanding of the concepts and principles for consulting with startups and small businesses. Students will work in self-created teams of 3-4 and can either bid for projects provided by the instructor, or source their own project so long as it fits the course criteria. Course time will include guest lecturers and consulting skills workshops. Student teams will be expected to meet together and with the client outside of class time.
Startup and Small-Business Consulting: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Startup and Small-Business Consulting: Read Less [-]

UGBA 195P Entrepreneurship: How to Successfully start a New Business 3 Units

Terms offered: Fall 2021, Fall 2019, Fall 2018
This course explores and examines key issues facing entrepreneurs and their businesses. It is intended to provide a broad spectrum of topics across many business disciplines including accounting, finance, marketing, organizational behavior, production/quality, technology, etc. Students will acquire a keen understanding of both the theoretical and real world tools used by today's entrepreneurial business leaders in achieving success in today's global business environment.
Entrepreneurship: How to Successfully start a New Business: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Entrepreneurship: How to Successfully start a New Business: Read Less [-]

UGBA 195S Entrepreneurship To Address Global Poverty 3 Units

Terms offered: Spring 2013, Spring 2012, Spring 2011
This course examines whether and how entrepreneurial ventures can meaningfully address global poverty vs. more traditional approaches such as foreign aid, private philanthropy or corporate social responsibility initiatives. Combining lectures, case studies, and interviews with social entrepreneurs, it explores poverty and entrepreneurship before focusing on their intersection in various bottom-of-pyramid markets, from health, housing, and education to energy, agriculture, and finance.
Entrepreneurship To Address Global Poverty: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Entrepreneurship To Address Global Poverty: Read Less [-]

UGBA 195T Topics in Entrepreneurship 1 - 3 Units

Terms offered: Spring 2022, Spring 2021, Spring 2020
Courses of this kind will cover issues in entrepreneurship that either appeal to a specialized interest by type of firm being started (e.g., new ventures in computer software) or in the aspect of the entrepreneurial process being considered (e.g., new venture funding). The courses typically will be designed to take advantage of the access offered by the University and the locale to knowledgeable and experienced members of the business community.
Topics in Entrepreneurship: Read More [+]

Rules & Requirements

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-3 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Topics in Entrepreneurship: Read Less [-]

UGBA C195C Life Sciences, Business, and Entrepreneurship Capstone Course 4 Units

Terms offered: Prior to 2007
Blended lecture / Project-based course where student teams build out a business plan for a mock biotech company, demonstrating advanced knowledge in therapeutics and business development. Throughout the course student teams will work toward a final project in which they will identify and present a technology overview, disease overview and explanation of unmet need, a development plan, a commercialization plan, risk mitigation strategy, and financials. Class will include field trips, guest lectures, and a pitch competition with prize.
Life Sciences, Business, and Entrepreneurship Capstone Course: Read More [+]

Rules & Requirements

Prerequisites: Students must be in their fourth and final year of the Life Sciences, Business, and Entrepreneurship Program in order to enroll in this class

Hours & Format

Fall and/or spring: 15 weeks - 4 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructors: Schaletzky, Dillin

Also listed as: MCELLBI C175

Life Sciences, Business, and Entrepreneurship Capstone Course: Read Less [-]

BIO ENG 196 Undergraduate Design Research 2 - 4 Units

Terms offered: Fall 2019, Fall 2018, Fall 2017
Supervised research. This course will satisfy the Bioengineering Design project/research requirement. Students with junior or senior status may pursue research under the direction of one of the members of the staff. A final report or presentation is required. For Bioengineering majors, the following policies apply: A maximum of 8 units of graded research units (BIO ENG H194 and/or BIO ENG 196) can be counted towards the Upper Division Technical Topics unit requirement. A maximum of 4 graded research units can be used towards the Upper Division Bioengineering Unit requirement. There is no limit to the number of letter-graded research units that can be applied to the 48 Engineering Unit requirement.
Undergraduate Design Research: Read More [+]
Rules & Requirements

Prerequisites: Junior or senior status, consent of instructor and faculty adviser

Repeat rules: Course may be repeated for credit up to a total of 8 units.

Hours & Format

Fall and/or spring: 15 weeks - 2-4 hours of independent study per week

Summer: 10 weeks - 3-9 hours of independent study per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Undergraduate Design Research: Read Less [-]

UGBA 196 Special Topics in Business Administration 1 - 4 Units

Terms offered: Spring 2022, Fall 2021, Spring 2021
Study in various fields of business administration. Topics will vary from year to year and will be announced at the beginning of each semester.
Special Topics in Business Administration: Read More [+]
Rules & Requirements

Prerequisites: Upper division standing

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of lecture per week

Summer:
6 weeks - 2.5-10 hours of lecture per week
10 weeks - 2-4 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Business Administration 196

Special Topics in Business Administration: Read Less [-]

UGBA 196SA Business Models for Sustainability 3 Units

Terms offered: Not yet offered
This course explores the ways in which business, social and environmental sustainability are intertwined. The course maps how business can play a definitive role in addressing the problems of sustainability, primarily with regard to climate change. The course examines a range of approaches to developing business models in the context of sustainability, the actions that business can take to improve environmental outlook, and the emergence of a sustainability-aware economy.
Business Models for Sustainability: Read More [+]
Hours & Format

Summer: 6 weeks - 6 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Business Models for Sustainability: Read Less [-]

UGBA 196SC Investing for Sustainability 3 Units

Terms offered: Not yet offered
This course examines how capital markets and the investment industry are responding to the growth in social and environmental sustainability, both as a financial risk to investment opportunities and increased public awareness in the role of financial markets and investment in social and environmental issues. The course includes 1) an introduction to capital markets including institutional investment, public finance and private capital, and 2) an examination of the rise of sustainability-related investing including environmental, social and governance investing, mission-related investment, venture capital impact investing, blended finance and shareholder activism on issues ranging from climate change to diversity, equity and inclusion.
Investing for Sustainability: Read More [+]
Hours & Format

Summer: 6 weeks - 6 hours of lecture per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Investing for Sustainability: Read Less [-]

BIO ENG 198 Directed Group Study for Advanced Undergraduates 1 - 4 Units

Terms offered: Fall 2021, Spring 2021, Spring 2020
Group study of a selected topic or topics in bioengineering, usually relating to new developments.
Directed Group Study for Advanced Undergraduates: Read More [+]
Rules & Requirements

Prerequisites: Upper division standing and good academic standing. (2.0 grade point average and above)

Credit Restrictions: Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog.

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of directed group study per week

Summer:
6 weeks - 2.5-10 hours of directed group study per week
8 weeks - 1.5-7.5 hours of directed group study per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Directed Group Study for Advanced Undergraduates: Read Less [-]

UGBA 198 Directed Study 1 - 4 Units

Terms offered: Spring 2016, Fall 2015, Spring 2015
Organized group study on topics selected by upper division students under the sponsorship and direction of a member of the Haas School of Business faculty.
Directed Study: Read More [+]
Rules & Requirements

Prerequisites: Consent of instructor

Credit Restrictions: Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog.

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of directed group study per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Formerly known as: Business Administration 198

Directed Study: Read Less [-]

BIO ENG 199 Supervised Independent Study 1 - 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020
Supervised independent study.
Supervised Independent Study: Read More [+]
Rules & Requirements

Credit Restrictions: Enrollment is restricted; see the Introduction to Courses and Curricul a section of this catalog.

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Summer:
6 weeks - 2.5-10 hours of independent study per week
8 weeks - 1.5-7.5 hours of independent study per week
10 weeks - 1.5-6 hours of independent study per week

Additional Details

Subject/Course Level: Bioengineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Supervised Independent Study: Read Less [-]

UGBA 199 Supervised Independent Study and Research 1 - 4 Units

Terms offered: Fall 2020, Spring 2015, Spring 2014
Enrollment restrictions apply.
Supervised Independent Study and Research: Read More [+]

Rules & Requirements

Prerequisites: Consent of instructor

Credit Restrictions: Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog.

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Summer:
6 weeks - 1-4 hours of independent study per week
8 weeks - 1-4 hours of independent study per week

Additional Details

Subject/Course Level: Undergrad. Business Administration/ Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Formerly known as: Business Administration 199

Supervised Independent Study and Research: Read Less [-]