Franklin W. Olin College of Engineering

Catalog 2006–07

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Photos: M.J. Maloney, Mark C. Flannery (aerial photos)

Message from the Provost

From its inception, Olin College has been about innovation and high standards. Our curriculum is the product of an unusual collaboration among faculty, staff, and students that is aimed at continually improving our academic program. In a sense, our curriculum will never be a finished product. We will always be enhancing it in pursuit of our mission of providing a superb engineering education to the nation's brightest and most enterprising students.

As you will see when you look through this catalog, Olin's academic program consists of more than just traditional engineering courses. Olin students often work in interdisciplinary teams in a project-based learning environment. The curriculum provides not only a first-rate engineering education, but also opportunities to explore entrepreneurship and a broad selection of the liberal arts.

Olin offers a "learning continuum" that includes co-curriculars, research, clubs, community service and "Passionate Pursuits," the study of individual intellectual interests. The learning continuum is vital for the kind of vibrant, student-centered culture we have created here at Olin — a culture that fosters hands-on learning, creativity, entrepreneurial thinking, and discovery. We invite you to explore Olin College.

Dr. David V. Kerns, Jr.
Provost

College Mission Statement

Olin College prepares future leaders through an innovative engineering education that bridges science and technology, enterprise, and society. Skilled in independent learning and the art of design, our graduates will seek opportunities and take initiative to make a positive difference in the world.

Long-term Aspiration

Olin College aspires to establish and maintain a position as a national leader in the development of new and effective approaches to undergraduate engineering education. It is our intent that, as we realize our mission, the educational and student life concepts and approaches we develop will inspire change at other respected engineering schools.

Olin History

Olin, the Man

Franklin W. Olin (1860–1951) was an engineer, entrepreneur, and professional baseball player. Raised in Vermont lumber camps and lacking a high school diploma, he qualified for entrance to Cornell University through self-instruction. At Cornell he majored in civil engineering and was captain of the baseball team. He even played major league baseball during the summers to finance his education. He went on to found the company known today as the Olin Corporation, a Fortune 1000 company.

Olin, the Foundation: F. W. Olin Foundation

In 1938, Mr. Olin transferred a large part of this personal wealth to a private philanthropic foundation. Over the subsequent two-thirds of a century, the F. W. Olin Foundation awarded grants totaling nearly $800 million to construct and fully equip 78 buildings on 58 independent college campuses. Recipients include Babson, Bucknell, Carleton, Case-Western, Colgate, Cornell, DePauw, Harvey Mudd, Johns Hopkins, Marquette, Rose-Hulman Institute, Tufts, University of San Diego, University of Southern California, Vanderbilt and Worcester Polytechnic. In 2004 the Foundation announced its intention to transfer its remaining assets to Olin College and close its doors. This final grant brings the Foundation's total commitment to Olin College to more than $460 million, which is one of the largest such commitments in the history of American higher education.

Olin, the Vision

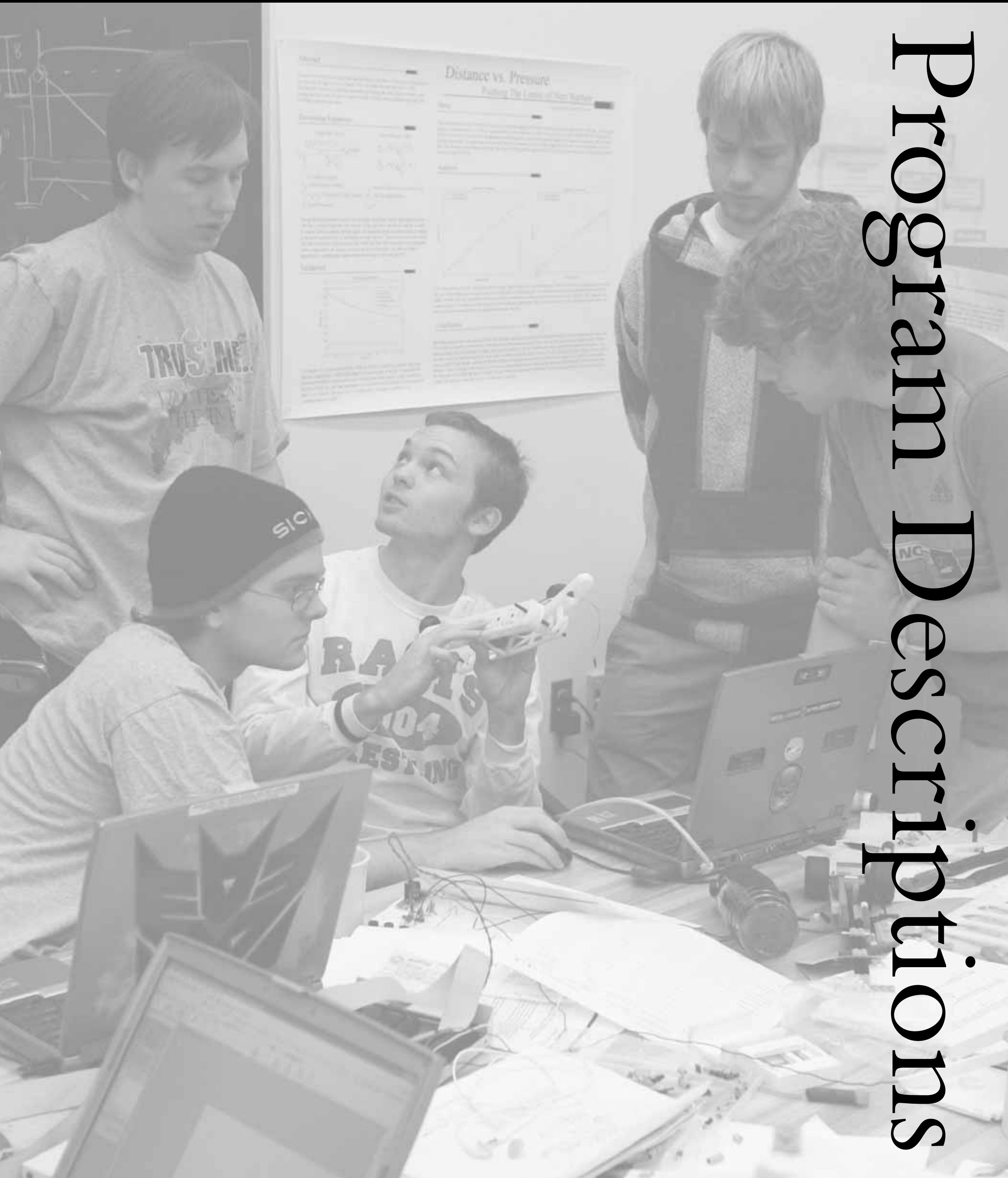
Starting in the late 1980's, the National Science Foundation and engineering community at-large began calling for reform in engineering education. In order to serve the needs of the growing global economy, it was clear that engineers needed to have business and entrepreneurship skills, creativity and an understanding of the social, political and economic contexts of engineering. The F. W. Olin Foundation decided the best way to maximize its impact was to create a college from scratch to address these emerging needs.

Olin, the College

The Franklin W. Olin College of Engineering received its educational charter from the Commonwealth of Massachusetts in 1997, the same year the Foundation announced its ambitious plans for the college. Planning and architectural design work for a state-of-the-art campus began almost immediately. By the end of 1999, the new institution's leadership team had been hired, and site development work commenced on 70 acres adjacent to Babson College. Olin's first faculty members joined the college by September 2000.

The college officially opened in fall 2002 to its inaugural freshman class. In the year prior to the opening, 30 student "partners" worked with Olin's world-class faculty to create and test an innovative curriculum that infused a rigorous engineering education with business and entrepreneurship as well as the arts, humanities and social sciences. They developed a hands-on, interdisciplinary approach that better reflects actual engineering practice. State-of-the-art facilities matched with first-rate students, nationally renowned professors and unbridled enthusiasm, have quickly established Olin as a nationally recognized center for innovation and excellence in engineering education. Olin graduated its first class in May 2006.

Program Descriptions



Objectives, Pedagogy and Curriculum

Introduction

Engineering education at Olin is in the liberal arts tradition, with a strong emphasis on the Arts, Humanities, Social Sciences, and Entrepreneurship. Olin is committed to preparing graduates who recognize the complexity of the world, who appreciate the relationship of their work to society, and who are dedicated to creative enterprises for the good of humankind. Olin College endeavors to provide its education at little cost to the student.

Olin College strives to foster in students:

- a deep appreciation and comprehension of the principles of engineering analysis and design;
- a broad knowledge of social and humanistic contexts;
- the ability to identify opportunities, articulate a vision, and see it to fruition; and
- dedication to intellectual vitality, community involvement and lifelong personal growth.

Objectives

Olin's educational program helps students become individuals who:

1. Can make a positive difference within their profession and their community.
2. Demonstrate technical competence and creative problem-solving skills that foster success in a variety of postgraduate environments, including professional practice and graduate school.
3. Are prepared for and capable of appropriate response to social, technical and global changes.

We hope that, after graduation, our students will increasingly demonstrate achievement of these objectives as follows:

1. They will demonstrate the ability to recognize opportunity and to take initiative. They will be able to communicate effectively and to collaborate well with others. They will understand the broad social, economic and ethical implications of their work, and will be cognizant of their professional responsibilities.
2. They will have a solid grounding in fundamental principles of science and engineering and the ability to apply this knowledge to the design, analysis, and diagnosis of engineering systems. They will be able to develop creative design solutions that are responsive to technical, social, economic and other realistic considerations.
3. They will demonstrate the results of a broad education that spans math, science, engineering, the arts, humanities, social sciences, and entrepreneurship. They will build on this foundation throughout their careers by engaging in independent learning in order to identify and respond to emerging technical and social developments.

Pedagogy

Olin College's educational perspective provides a distinctive student experience designed to foster student engagement and development. Some of the key features of the Olin College experience are described in the following paragraphs.

Hands-On Learning

Olin has a strong commitment to incorporating hands-on educational experiences through lab and project work in many courses. From the outset of the curriculum, students build technical knowledge and develop practical skills by analyzing, designing, or fabricating engineering systems. First year Integrated Course Blocks (ICBs) provide hands-on projects involving the modeling, simulation, and analysis of engineering systems. Science courses offer opportuni-

ties for experimental design and the use of modern instrumentation and testing techniques. The design stream offers opportunities for students to design, prototype, and test solutions to authentic problems.

Open-Ended Project-Based Learning

Throughout the curriculum, Olin students gradually build competency in solving open-ended problems. Projects are found in all four years of the curriculum, and project experiences gradually increase in scale, complexity, and realism as students develop their knowledge and skills. In open-ended projects, student teams identify and define problems, assess opportunities, apply technical knowledge, demonstrate understanding of contextual factors, muster appropriate resources to solve problems, and apply skills such as teamwork, communication, and idea generation. Olin's open-ended project emphasis culminates in an ambitious two-semester SCOPE project that engages student teams in significant design problems with realistic constraints.

Multidisciplinary Integration

Olin experiences are designed to build connections between fundamental science, mathematics, and engineering; between different fields of engineering; between the arts, humanities and social sciences and technical disciplines; and between business, entrepreneurship, and technology. As a result, the Olin curriculum is conceived and taught in a highly interdisciplinary way.

In the first year, students learn in Integrated Course Blocks (ICBs) designed to take advantage of the synergies that exist among mathematics, science, and engineering topics, including coordinated opportunities for students to apply fundamental math and science to real engineering problems and that further elucidate important linkages among disciplinary topics.

In addition to the first-year ICBs, Olin builds multidisciplinary connections through tightly coupled, faculty team-taught courses such as the Paul Revere: Tough as Nails course block that links history of technology with materials science. Many other courses feature teaching or visits from faculty members who share different perspectives and thereby help students understand the broader context and implications of their work.

Competency Assessment

In addition to course-based graduation requirements, Olin develops and assesses student growth in a number of overarching competency areas. Through Olin's competency learning and assessment system, students demonstrate skill in essential areas such as communication, qualitative understanding and quantitative analysis, teamwork, contextual thinking, opportunity assessment, diagnosis, design, and lifelong learning.

Feedback

Olin College fosters a culture of continual feedback and improvement. Olin's curriculum, courses, and extra-curricular activities are shaped by student input and feedback. Faculty solicit student feedback and routinely adjust course direction and areas of emphasis to better address student educational needs. Students are expected to be active learners and participants in the process of continual improvement.

Individualized and Student-Designed Options

Olin students may design or customize many aspects of their educational experience. Many Olin courses include student-designed components such as projects, self-study modules, and selection of emphasis areas. More substantial student-designed and student-driven learning may be found in the following activities:

Self-Study The Olin Self Study (OSS) is a four-credit institutional requirement in which each student works independently to select and study a body of literature in an area of interested. It is an opportunity to develop the skills and attitudes of life-long learning, a competency Olin considers vital for engineers working in an environment of rapidly-changing technology.

SCOPE and Capstones A student's final year at Olin centers on an ambitious year-long Senior

Consulting Program for Engineering (SCOPE) project. A typical SCOPE project is undertaken by a team of four to eight students under the supervision of an Olin faculty member and serves an external partner. The SCOPE Project prepares students for life and work in their chosen profession. In addition, each student undertakes a self-designed one-semester Capstone project in an area of interest within the Arts, Humanities, Social Sciences, or Entrepreneurship.

Cross Registration Most students choose to complete some degree requirements at Olin's neighboring institutions. Cross registration agreements are in place at Wellesley, Babson, and Brandeis, enabling Olin students to benefit from other institutions' expertise in the arts, humanities, social sciences, natural sciences, and business topics.

Self-Designed Engineering (E) Degree Concentrations Besides designated concentrations, the Engineering (E) degree offers students the opportunity to design their own concentrations, subject to review and approval by the Engineering Program Group.

Away Experience The Olin curriculum is designed so that students who wish to spend a semester away from the College can do so. The away experience may take several forms including experience abroad or at another U.S. institution in a new cultural setting. The away experience can occur during a semester or a combination of a semester and summer.

Research Some students choose to enhance their educational experience through participation in research activities. Olin offers many opportunities for faculty-directed undergraduate research, both during the academic year and during the summer. Students may receive either academic credit or pay for a research activity. Students are encouraged to become involved in research early in their undergraduate career, and students may participate in research as early as their first year.

Independent Study In independent study activities, students work with faculty members to design and implement a learning and assessment plan for the study of topics not covered by listed Olin courses.

Passionate Pursuits Students are encouraged to undertake non-degree credit activities in the form of Passionate Pursuits. These programs seek to recognize the diversity of technical, artistic, entrepreneurial, humanist, and philanthropic interests that students bring to the College. The College encourages the pursuit of such activities for both personal and professional development. Olin supports these endeavors by providing resources as well as recognition on the transcript.

Curriculum

The Olin College curriculum provides a strong foundation in engineering, mathematics, and applied science subjects and promotes development of engineering analysis, diagnosis, modeling, and problem-solving skills.

Engineering

Engineering is using technical knowledge to solve society's problems. Every Olin graduate takes a program of studies designed to provide a superb grounding in the technical material of engineering while simultaneously connecting that material to its applications and contexts of use. From the earliest modeling and simulation activities of the Integrated Course Blocks (ICBs) and the hands-on projects of Design Nature through the project-intensive Principles of Engineering and User Oriented Collaborative Design courses, Olin students are continually putting engineering knowledge to work.

Each Olin student also pursues a major program or concentration that is broad, deep, coherent, and rigorous in the field of Electrical and Computer Engineering, Mechanical Engineering, or another area of Engineering of the student's choice. Olin's Engineering curriculum culminates in the Senior Olin Capstone for Engineering (SCOPE) project, in which interdisciplinary teams of students work for a full year to solve an authentic, intensive, real-world engineering problem.

Math and Science

Olin's math and science curriculum serves two purposes. First, it provides students with an understanding of the deep and precise ideas that characterize science and math. Second, it teaches fundamental ideas and techniques in science and math whose application makes engineering possible.

A student's math and science education begins at Olin with two Integrated Course Blocks (ICBs) centered around the modeling, analysis, and control of compartment and spatially distributed systems. Math in the ICBs is focused in the first semester on differential and integral calculus in the context of elementary numerical analysis, and on vector calculus in the second semester. Science is focused on physical mechanics in the first semester and on electromagnetism and waves in the second semester.

Olin also requires all students to complete coursework in Biology and in either Materials Science and Applied Chemistry or General Chemistry.

Design

Over the course of four years, students complete design projects that enable them to apply technical and non-technical knowledge and skills, develop understanding of design processes, identify and define problems, explore contextual factors that contribute to design decisions, and muster the resources necessary to realize solutions. Students undertake open-ended design problems in many courses, but design learning is emphasized and explicitly developed through a sequence of required design courses. All students complete Design Nature, User-Oriented Collaborative Design, and a further design depth course in an area of interest.

Arts, Humanities, and Social Sciences (AHS)

Olin students study the Arts, Humanities and Social Sciences in order to complete their liberal arts education, develop broad knowledge of social, cultural, and humanistic contexts, and foster their ability to apply contextual thinking in the study of engineering and other disciplines. A firm foundation in AHS content, skills, and attitudes is an essential aspect of an engineering education. Students select AHS courses from offerings at Olin and neighboring institutions (Wellesley, Brandeis and Babson) in order to satisfy their individual needs and interests. All students complete a "foundation" AHS course that offers an overview of an AHS discipline, writing instruction and practice, an introduction to contextual and critical thinking, and integration of the content and perspectives of different disciplines. In addition, students complete additional AHS coursework in areas of interest.

Each Olin student also designs a sequence of AHS or Entrepreneurship courses to provide greater depth in a single field. This sequence culminates in a student-conceived AHS or Entrepreneurship Capstone, requiring students to integrate acquired skills and knowledge. AHS Capstone experiences include research or artistic works, service projects or advanced study.

Entrepreneurship (E!)

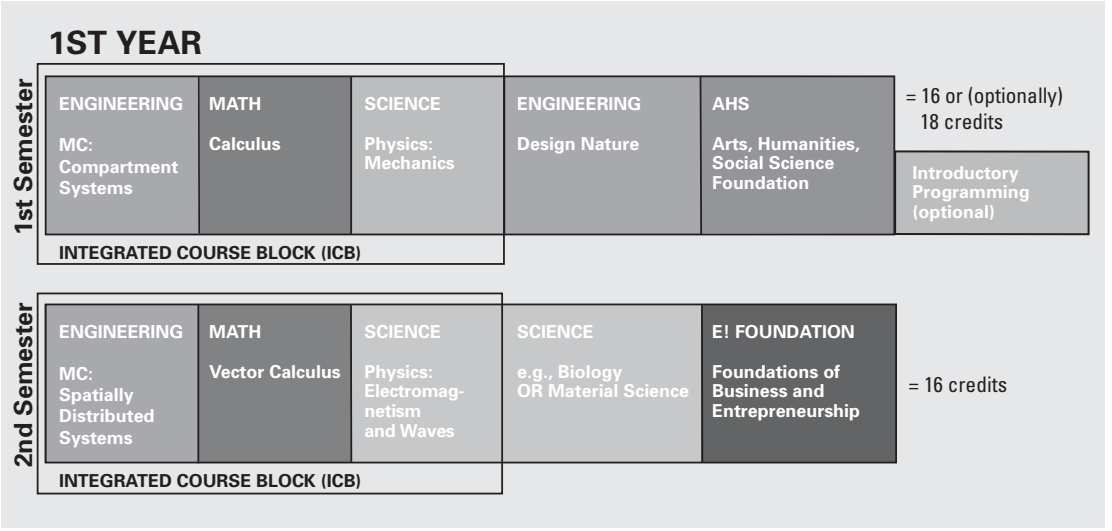
Entrepreneurship is the process of identifying opportunities, fulfilling human needs, and creating value. An understanding of the knowledge, skills and behaviors required for success in entrepreneurship will position students to become better engineers and to make a positive difference in the world. To this end, Olin's curriculum supports the learning of entrepreneurship, broadly defined. Olin graduates will demonstrate a capacity to identify social, technical, and economic opportunities, to predict challenges and costs associated with the pursuit of opportunities, and to make decisions about which opportunities are most worthy of pursuit.

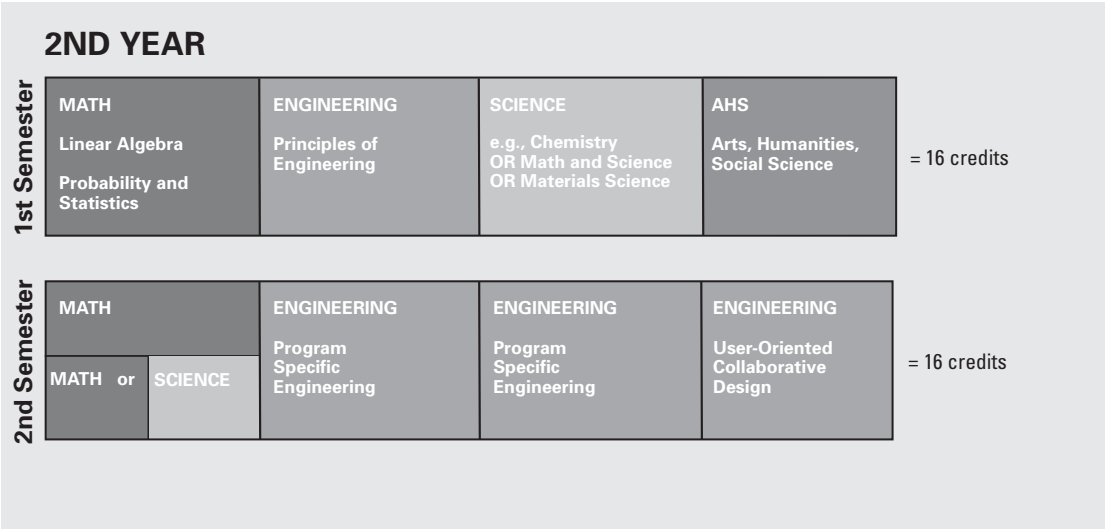
Olin students are required to complete a Foundations of Business and Entrepreneurship course and the entrepreneurial components of design courses. Students have the opportunity to enroll in courses relating to business at Babson College, and interested students may design a sequence of courses to explore an entrepreneurship discipline in depth.

Many students will also explore entrepreneurship and develop opportunity assessment abilities through their SCOPE experience and out-of-class activities such as student clubs,

Sample Four-year Schedule

The curriculum provides for considerable flexibility and student choice about how to meet requirements. This chart is an example of one of many ways a student might progress through the four-year program.





community service, and Passionate Pursuits. The Entrepreneurship experience can culminate in an Entrepreneurship Capstone, requiring students to integrate acquired skills and knowledge.

Through a special arrangement with the Babson College Graduate School, Olin students have the opportunity for a "fast track" to a Master's Degree in Management with a specialization in Technical Entrepreneurship.

Communication

Throughout the curriculum, Olin College integrates the instruction and practice of written, spoken, visual, and graphical communication. Thus, it is not only within the Arts, Humanities, and Social Sciences that an Olin student can expect communication-intensive course work. The Olin curriculum reflects the college's commitment to the engineer as a highly skilled communicator.

3RD YEAR

1st Semester	ELECTIVE	ENGINEERING Program Specific Engineering	ENGINEERING Program Specific Engineering	AHS Arts, Humanities, Social Science	= 16 credits
2nd Semester	ELECTIVE	ENGINEERING Program Specific Engineering	ELECTIVE	AHS/E! Arts, Humanities, Social Science or Entrepreneurship	= 16 credits

4TH YEAR

1st Semester	SCIENCE or MATH MATH or SCIENCE	ENGINEERING Design Depth	ENGINEERING SCOPE	AHS/E! Arts, Humanities, Social Science or Entrepreneurship	= 16 credits
2nd Semester	ENGINEERING Olin Self-Study	ENGINEERING Program Specific Engineering	ENGINEERING SCOPE	AHS/E! Capstone	= 16 credits

Graduation Requirements

Students must satisfy two classes of requirements in order to graduate from Olin: **General Requirements** and **Program-Specific Requirements**. General requirements must be satisfied by all students regardless of degree or concentration. Program-Specific Requirements vary depending on the degree being sought (ECE, ME or E) and, for the E degree, on the chosen concentration.

General Requirements and Program-Specific Requirements are further broken down into **Distribution Requirements** and **Course Requirements**, both of which must be satisfied.

Distribution Requirements specify the minimum total number of credits that must be completed in each of five broad areas (Engineering, Math, Science, AHS, and Entrepreneurship).

Course requirements specify which courses must be completed. Some course requirements can only be satisfied by completing a particular course. Other course requirements allow more choice. Some courses may be used to satisfy one of several course requirements, but students must choose which course requirement such course's completion is applied toward. A course completion can only satisfy one course requirement.

A credit corresponds to an average of three hours of student work each week throughout an academic semester. Therefore, a four-credit course (the most common course size at Olin) generally requires students to spend 12 hours each week attending classes, completing homework, participating in laboratory activities, and fulfilling all other course responsibilities.

The course catalog lists, for each course, the number of credits earned and their area. Most courses provide credit in only one area. Some courses distribute their credits across more than one area.

Students must register for at least 12 credits but no more than 20 credits each semester. Students typically register for approximately 16 credits per semester. First-year students are limited to 18 credits in the first semester.

Some activities, like Passionate Pursuits and a few classes, provide non-degree credit, which appears on the transcript, but does not count toward Credit Requirements. Non-degree credit counts toward the maximum credits per semester, but not toward the minimum.

** The AHS Capstone does not count toward the 12 credit AHS minimum.*

General Distribution and Course Requirements

General Distribution Requirements

All students must complete a minimum of 120 credits appropriately distributed among five areas of study. The table below gives the minimum credits required in each area.

Area	Minimum Credits Required
Engineering	46
Math and Science	30 of which at least 10 must be Math
AHS and Entrepreneurship	28 of which at least 12 must be AHS*

General Course Requirements

All Olin students, regardless of degree or concentration, must satisfy the following course requirements. The table includes one or more current classes that satisfy each requirement.

Integrated Course Blocks (ICBs)

Title	Number	Notes
Integrated Course Block 1 (ICB1)		
• Math: Calculus	MTH 1110	
• Physics: Mechanics	SCI 1110	
• Engineering: Modeling and Control of Compartment Systems	ENGR 1110	
Integrated Course Block 2 (ICB2)		
• Math: Vector Calculus	MTH 1120	
• Physics: Electromagnetism and Waves	SCI 1120	
• Engineering: Modeling and Control of Spatially Distributed Systems	ENGR 1120	

Math and Science (in addition to ICBs)

Title	Number	Notes
Linear Algebra	MTH 2120	
Probability and Statistics	MTH 2130	
Foundations of Modern Biology (with laboratory)	SCI 1210	
Chemistry/Material Science — One of: • Introduction to Chemistry • Materials Science and Solid State Chemistry (with laboratory) • Organic Chemistry (with laboratory)	 SCI 1310 SCI 1410 SCI 2320	

Engineering (in addition to ICBs)

Title	Number	Notes
Principles of Engineering	ENGR 2210	
SCOPE	ENGR 4190	
Olin Self Study	ISR 4198	

Design

Title	Number	Notes
Design Nature	ENGR 1200	
User-Oriented Collaborative Design	ENGR 2250	
Design Depth Course — One of: • Sustainable Design • Human Factors and Interaction Design • Design for Manufacturing	 ENGR 3210 ENGR 3220 ENGR 3380	 Upper-level, four credit design course in an area of interest.

AHS and Entrepreneurship

Title	Number	Notes
AHS Foundation — One of: • History of Technology: A Cultural and Contextual Approach • History and Society • Arts and Humanities • The Wired Ensemble — Instruments, Voices, Players • Seeing and Hearing: Communicating with Photographs, Video and Sound • Culture & Difference: an Anthropological Approach • What is "I"?	 AHSE 1100 AHSE 1101 AHSE 1102 AHSE 1122 AHSE 1130 AHSE 1140 AHSE 1150	All AHS foundation courses offer: • an introduction and overview of an AHS discipline • writing instruction and practice • an introduction to contextual and critical thinking, and • examples of how one might integrate the content and perspectives of different disciplines.
Foundations of Business and Entrepreneurship	AHSE 1500	
AHS or Entrepreneurship Concentration		Students must design a sequence of at least eight credits of courses in an approved AHS or Entrepreneurship discipline.
AHS or Entrepreneurship Capstone		Students must design and complete an authentic, four credit AHS or Entrepreneurship project in their area of AHS or Entrepreneurship concentration.

Self-Study

The Olin Self Study (OSS) is a four-credit self-study project in which students identify an area of interest or a question of interest, develop and follow a plan of study in pursuit of understanding important concepts in the proposed area or in pursuit of an answer to the proposed question, and write a report of the knowledge gained, applied, analyzed, synthesized, and/or evaluated through the investigation. The OSS serves to (1) develop students' skills in working independently to learn challenging material and to tackle challenging problems; (2) develop students' skills in independent writing; and (3) hone students' skills and attitudes enabling life-long learning, a competency Olin considers vital for engineers working in an environment of rapidly changing technology.

Students can satisfy the OSS requirement by completing four credits of self-study that is relevant to their SCOPE project and that is advised and evaluated by their SCOPE advisor. Students can also work under the supervision of an Olin faculty member on projects not related to SCOPE.

Independent Study and Research

In independent study activities, students work with faculty members to design and implement a learning and assessment plan for the study of topics not covered by listed Olin courses.

Olin offers opportunities for undergraduate research experiences both during the academic year and during the summer. Students may receive academic credit or pay for a research activity, but not both. Independent study and research credit may be applied toward credit requirements in particular areas (Math/Science/AHS/Entrepreneurship/Engineering) and toward the overall 120 credit requirement. These activities are normally taken Pass/No Credit. In order to use independent study to satisfy a course requirement, prior approval must be obtained from the CSTB and the activity must be taken for a grade. Only in exceptional cases will research be approved to satisfy a course requirement.

Program-Specific Requirements

Olin College offers three degrees: Electrical and Computer Engineering (ECE), Mechanical Engineering (ME), and Engineering (E). Course Requirements for each of these degrees are outlined below. A course that is used to satisfy a General Course Requirement cannot also be used to satisfy a Program-Specific Requirement.

Electrical and Computer Engineering (ECE)

Electrical and Computer Engineering is a degree program designed to meet ABET Program Criteria in electrical and computer engineering. Olin's ECE degree focuses on the devices and structure of computing and communications systems, with an emphasis on hardware design. The Electrical and Computer Engineering Program has the following three educational objectives:

Program Educational Objective I: *Our graduates will be recognized as individuals who can make a positive difference within their profession and their community.*

Elaboration: Our graduates will demonstrate the ability to recognize opportunity and to take initiative. They will be able to communicate effectively and to work effectively on teams. They will understand the broad social, economic and ethical implications of their work, and will be cognizant of their professional responsibilities.

Program Educational Objective II: *Our graduates will demonstrate technical competence in electrical and computer engineering and creative problem-solving skills that foster success in a variety of postgraduate environments, including professional practice and graduate school.*

Elaboration: Our graduates will have a solid grounding in fundamental principles of science and electrical and computer engineering and the ability to apply this knowledge to analyze and diagnose electrical and computer engineering systems. They will be able to develop creative design solutions that are responsive to technical, social, economic and other considerations.

Program Educational Objective III: *Our graduates will be prepared for and capable of appropriate response to social, technical and global changes during their lifetimes.*

Elaboration: Our graduates will demonstrate the results of a broad education that focuses on electrical and computer engineering, but also encompasses the arts, humanities, social sciences, and entrepreneurship. They will build on this foundation by engaging in independent learning in order to identify and respond to emerging technical and social developments.

The Course Requirements of the ECE program are:

Requirement	Course Name	Number
ECE Math — All of:	Differential Equations	MTH 2140
	Discrete Mathematics	MTH 2110
ECE — All of:	Signals and Systems	ENGR 2410
	Introduction to Microelectronic Circuits	ENGR 2420
	Software Design	ENGR 2510
	Computer Architecture	ENGR 3410
	Analog and Digital Communications	ENGR 3420
ECE — One of:	Robotics	ENGR 3390
	Digital VLSI	ENGR 3430
	Modern Sensors	ENGR 3440
	Semiconductor Devices	ENGR 3450
	Any level 3000 or higher E:C course, or other course approved by ECE program group	

Mechanical Engineering (ME)

Mechanical Engineering is a degree program designed to meet ABET Program Criteria in Mechanical Engineering. The ME requirements emphasize the design of mechanical and thermal/fluid systems. The Mechanical Engineering Program Educational Objectives are:

Program Educational Objective I: *Our graduates will be recognized as individuals who can make a positive difference within their profession and their community.*

Elaboration: Our graduates will demonstrate the ability to recognize opportunity and to take initiative. They will be able to communicate effectively and to work effectively on teams. They will understand the broad social, economic and ethical implications of their work, and will be cognizant of their professional responsibilities.

Program Educational Objective II: *Our graduates will demonstrate technical competence in mechanical engineering and creative problem-solving skills that foster success in a variety of post-graduate environments, including professional practice and graduate school.*

Elaboration: Our graduates will have a solid grounding in fundamental principles of science and mechanical engineering and the ability to apply this knowledge to analyze and diagnose mechanical engineering systems. They will be able to develop creative design solutions that are responsive to technical, social, economic and other considerations.

Program Educational Objective III: *Our graduates will be prepared for and capable of appropriate response to social, technical and global changes during their lifetimes.*

Elaboration: Our graduates will demonstrate the results of a broad education that focuses on mechanical engineering, but also encompasses the arts, humanities, social sciences, and entrepreneurship. They will build on this foundation by engaging in independent learning in order to identify and respond to emerging technical and social developments.

The Course Requirements of the ME program are:

Requirement	Course Name	Number
ME Math:	Differential Equations	MTH 2140
	One of:	
	• Partial Differential Equations	MTH 3120
	• Non-Linear Dynamics and Chaos	MTH 3170
	• other math course approved by ME program group	
ME — All of:	Transport Phenomena	ENGR 3310
	Mechanics of Solids and Structures	ENGR 3320
	Mechanical Design	ENGR 3330
	Dynamics	ENGR 3340
	Thermodynamics	ENGR 3350
ME — One of:	Topics in Fluid Dynamics	ENGR 3360
	Controls	ENGR 3370
	Design for Manufacturing	ENGR 3380
	Robotics	ENGR 3390
	Failure Analysis and Prevention	ENGR 3820
	Phase Transformation in Ceramic and Metallic Systems	ENGR 3830
	other course approved by ME program group	

Engineering

The Engineering Degree program offers a major in Engineering that is both rigorous and flexible. This program gives students the option to pursue new areas of engineering and interdisciplinary combinations of engineering and other fields. It is also intended to give the college mechanisms for investigating new areas and creating new concentrations. All paths to graduation with the engineering degree provide for all outcomes required by the ABET General Criteria. The Engineering Program has three educational objectives:

Program Educational Objective I: *Our graduates will be able to make a make a positive difference within their profession and their community.*

> **Elaboration:** Our graduates will demonstrate the ability to recognize opportunity and to take initiative. They will be able to communicate effectively and to work well on teams. They will understand the broad social, economic and ethical implications of their work, and will be cognizant of their professional responsibilities.

Program Educational Objective II: *Our graduates will demonstrate technical competence and creative problem-solving skills that foster success in a variety of postgraduate environments, including professional practice and graduate school.*

> **Elaboration:** Our graduates will have a solid grounding in fundamental principles of mathematics, science, and engineering and the ability to apply this knowledge to the design, analysis and diagnosis of engineering systems. They will be able to develop creative design solutions that are responsive to technical, social, economic and other realistic constraints and considerations.

Program Educational Objective III: *Our graduates will be prepared for and capable of appropriate response to social, technical and global changes during their careers.*

> **Elaboration:** Our graduates will possess a broad understanding of math, science, engineering, the arts, humanities, social sciences, and entrepreneurship. They will build on this foundation throughout their careers by engaging in independent learning in order to identify and respond to emerging technical and social developments.

Students who choose the Engineering degree may specify a concentration, which is a set of classes that constitute a coherent area of study. A student's concentration appears on the diploma but not on the official transcript. The college offers designated concentrations in BioEngineering, Computing, Materials Science, and Systems. Alternatively, students may design a concentration in another area.

Students who choose the Engineering degree must submit a concentration plan along with their declaration of major. The plan lists the courses the student intends to take to fulfill graduation requirements, and demonstrates that these courses (along with additional required courses) constitute a major in engineering that has depth, breadth, coherence, and rigor.

The concentration plan must be signed by the student's adviser and two faculty members whose area of expertise is relevant to the proposed area of study (if the adviser's area is relevant, the adviser can count as one of the two).

Concentration plans are reviewed by the Engineering Program Group. This group is responsible for checking the following criteria:

- Do the proposed courses constitute a major in Engineering that has breadth, depth, coherence and rigor?
- Do the faculty who approved the plan have relevant expertise? Should other faculty be consulted?

- Is the plan feasible based on a reasonable forecast of course offerings? The availability of faculty and other resources determines which classes we can offer and their schedule, which may limit a student's ability to complete a particular concentration.
- Is the plan comparable to the designated concentrations and previous student-designed concentrations? If a student-designed concentration is named, is the proposed name accurate and appropriate?

The designated concentrations are examples of recommended programs, but all course plans go through the same review process. The concentration plan is provisional. If approved and completed, a student may use it to graduate. Minor substitutions may be made with adviser approval; substantive changes require approval of the Engineering Program Group.

Engineering: BioEngineering (E:Bio)

Bioengineering is an interdisciplinary concentration rooted in engineering, chemistry, and biology. The E:Bio concentration prepares students to approach problems important to biology, medical research, and clinical studies; it provides some of the background required for medical school.

Requirement	Course Name	Number
E:Bio Math	Four credits of advanced Mathematics appropriate to the program of study; differential equations is strongly recommended	
E:Bio Biology	Four credits of advanced Biology	
E:Bio Chemistry/ Materials Science	Four credits of Chemistry, Materials Science, or Organic Chemistry in addition to the General Course Requirements	SCI 1310, SCI 1410, SCI 2320
E:Bio Bioengineering	12 credits of coursework appropriate to Bioengineering	

Advanced Biology courses include SCI 2210 Immunology and SCI 3210 Human Molecular Genetics in the Age of Genomics; other courses may also be appropriate.

Bioengineering courses include ENGR 3600 Topics in Bioengineering, ENGR 3810 Structural Biomaterials, and additional E:Bio courses under development.

E:Bio concentration plans may include classes at Babson, Brandeis, Wellesley, or study away institutions.

Students interested in pursuing medical, dental or veterinary school admission should contact Dr. Janey Pratt, Olin Senior Partner in Health Science, as early in their Olin studies as possible, and ensure that their concentration plan meets the requirements of the programs they are considering.

Engineering: Computing (E:C)

The Computing concentration integrates the study of computer science and software engineering within a broad interdisciplinary context. The E:C concentration offers significant flexibility, particularly with courses taken off-campus.

Requirement	Course Name	Number
E:C Math	Discrete Mathematics	MTH 2110
E:C — All of:	Software Design Foundations of Computer Science Software Systems 8 additonal credits in computing.	ENGR 2510 ENGR 3520 ENGR 3525

Additional computing credits may include Olin courses such as ENGR 3410 Computer Architecture or advanced computer science courses at Babson, Brandeis, Wellesley, or study away institutions. ENGR 3220 Human Factors and Interaction Design may count toward the course requirements of E:C, but only if it is not used to satisfy the Design Depth requirement.

Engineering: Materials Science (E:MS)

Materials Science is an inherently interdisciplinary field with a strong presence throughout most engineering and science disciplines. Olin's materials science concentration provides an integrated approach to materials, merging a variety of engineering design principles with concepts from solid-state physics and applied chemistry. Students who complete the E:MS concentration will achieve an understanding of structure-property-processing-performance relationships in materials, the ability to apply advanced scientific and engineering principles to materials systems, and the skills to synthesize appropriate technical and contextual information to solve materials selection and design problems.

Requirement	Course Name	Number
E:MS Math	Differential Equations	MTH 2140
E:MS	20 credits of engineering subjects appropriate to the program of study with a minimum of twelve credits in materials science subjects.	

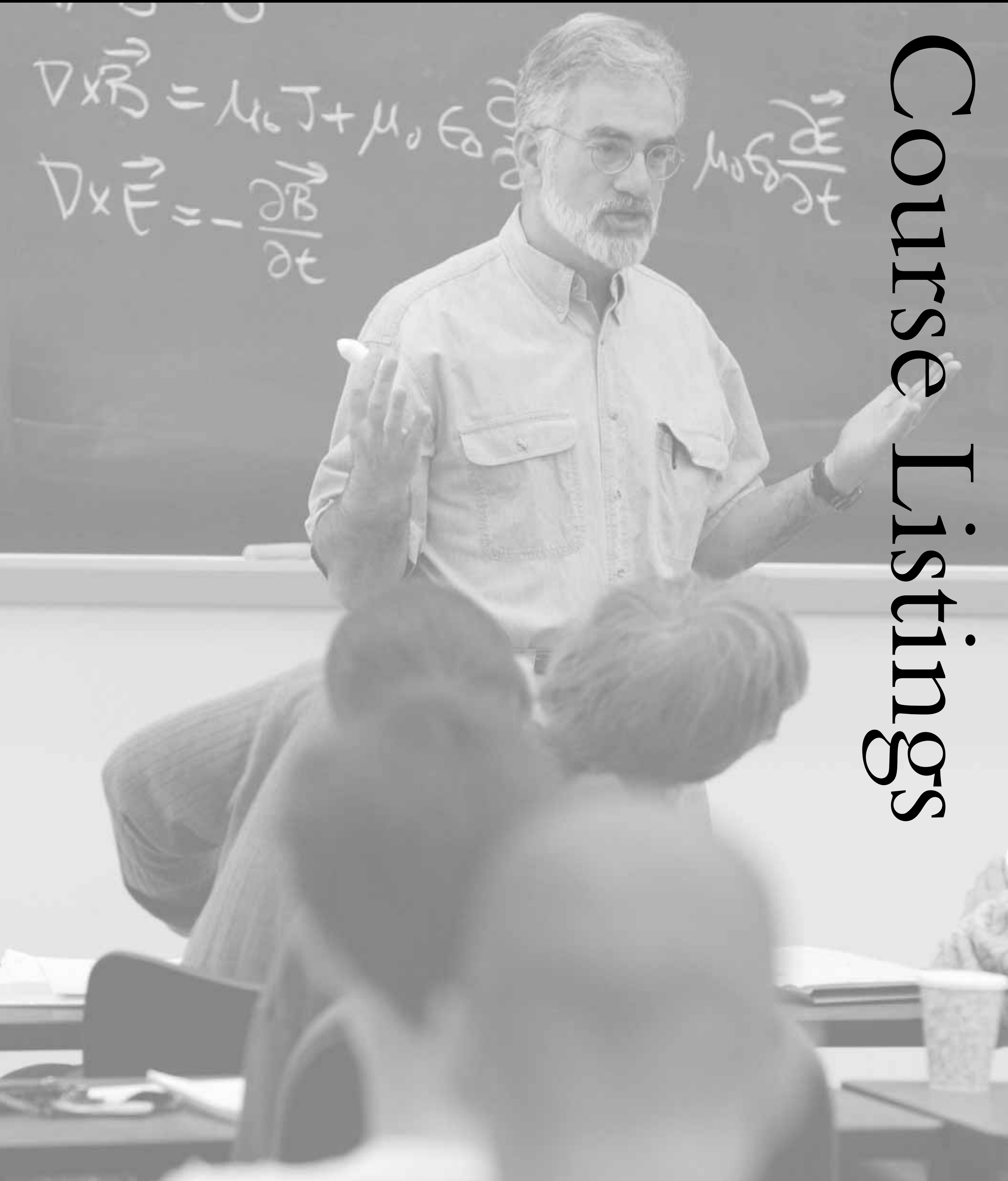
Students wishing to pursue the materials science concentration within the Engineering major must develop a specific program of study in consultation with materials science and applied chemistry faculty. Such programs may emphasize different aspects of materials science, such as structural materials, solid state properties of materials, processing and manufacturing, or applied chemistry.

Engineering: Systems (E:SYS)

The Systems concentration focuses on the design of products that integrate significant technology from multiple disciplines, with a focus on products that merge ECE and ME. Such products are particularly hard to create because designers tend to have specialized, rather than broad, knowledge of disciplines.

Requirement	Course Name	Number
E:SYS Math	Differential Equations	MTH 2140
E:SYS ECE Any two of:	Signals and Systems Introduction to Microelectronics Circuits Software Design Computer Architecture Analog and Digital Communications	ENGR 2410 ENGR 2420 ENGR 2510 ENGR 3410 ENGR 3420
E:SYS ME Any two of:	Transport Phenomena Mechanics of Solids and Structures Mechanical Design Dynamics Thermodynamics	ENGR 3310 ENGR 3320 ENGR 3330 ENGR 3340 ENGR 3350
E:SYS	Systems	ENGR 3710

Course Listings



Offerings

Information in this catalog is subject to change. Up-to-date information is available at the StAR website: http://star.olin.edu.

Course Numbering Nomenclature

Course numbers are composed of an alphabetic prefix and a numeric suffix. The alphabetic prefix indicates the primary area of the course, according to the following table. Note that some courses earn credit for multiple areas (see Course Listings Table below).

Alphabetic Prefix	Primary Area
AHSE	AHS/Entrepreneurship
ENGR	Engineering
MTH	Mathematics
SCI	Science

The first digit of the numeric suffix indicates the nominal level of a course according to the following table.

Numeric Suffix	Level
0XXX	Not Applicable
1XXX	Introductory
2XXX	Intermediate
3XXX	Advanced
4XXX	Summative/Capstone/SCOPE

Hours/Week Nomenclature

To better allow teaching staff, facilities schedulers, and students to manage the time requirements of every course, the number of expected hours per week is indicated by a triple of numbers, as follows:

(Contact) – (Non-Contact) – (Preparation)

- **Contact** The first number indicates approximately the number of hours per week teaching staff and students will spend together in scheduled school facilities.
- **Non-Contact** The second number indicates approximately the number of hours students will spend each week working on their own in scheduled school facilities.
- **Preparation** The third number indicates approximately the number of hours per week a well-prepared student with good study habits should expect to spend studying and completing homework, reading assignments, projects, etc.

For example, the AHSE 1100 History of Technology: A Cultural and Contextual Approach course is described as a 4-0-8 course, so students in the course can expect to spend four hours in class with an instructor, and approximately eight hours outside of class completing course-related assignments.

Prerequisites and Co-requisites

Prerequisites and co-requisites may occasionally be waived with permission of the course instructor.

Course Listings Summary

Number	Name	Prerequisites	Co-requisites	Instructor	Credits	Hours	Offered
AHSE 0112	The Olin Conductorless Orchestra	Audition		Dabby	1 AHS	2-0-1	Fall and Spring
AHSE 1100	History of Technology: A Cultural and Contextual Approach			Martello	4 AHS	4-0-8	Fall
AHSE 1101	History and Society				4 AHS	4-0-8	Fall
AHSE 1102	Arts and Humanities				4 AHS	4-0-8	Fall
AHSE 1122	The Wired Ensemble — Instruments, Voices, Players	Ability to read music		Dabby	4 AHS	4-0-8	Fall
AHSE 1130	Seeing and Hearing: Communicating with Photographs, Video and Sound			Donis-Keller	4 AHS	4-0-8	Fall
AHSE 1140	Culture & Difference: An Anthropological Approach			Lynch	4 AHS	4-0-8	Fall
AHSE 1150	What is "I"?			Stein	4 AHS	4-0-8	Fall (not offered every year)
AHSE 1500	Foundations of Business and Entrepreneurship			Bourne, Schiffman	4 AHSE	4-0-8	Fall and Spring
AHSE 2110	The Stuff of History: Materials and Culture in Ancient, Revolutionary and Contemporary Times		SCI 1410	Martello	4 AHS	4-0-8	Alt Fall (even years)
AHSE 2112	Six Books that Changed the World	AHS Foundation		Martello	2 AHS	4-0-8	(1st half)
AHSE 2114	Science Fiction and Historical Context	AHS Foundation		Martello	2 AHS	4-0-8	(2nd half)
AHSE 2120	Heroes for the Renaissance Engineer: Leonardo, Nabokov, Bach, Borodin			Dabby	4 AHS	3-0-9	Alt Spring (odd years)
AHSE 2130	The Intersection of Art and Science			Donis-Keller	4 AHS	4-0-8	Alt Fall (even years)
AHSE 2131	Responsive Drawing and Visual Thinking			Donis-Keller	4 AHS	4-0-8	Fall
AHSE 2140	Anthropology: Culture Knowledge & Creativity	AHS Foundation		Lynch	4 AHS	4-0-8	Spring
AHSE 2199	Special Topics in Arts, Humanities & Social Sciences				AHS		
AHSE 3130	Advanced Digital Photography	AHSE 1130		Donis-Keller	4 AHS	4-0-8	Alt Fall (odd years)

Number	Name	Prerequisites	Co-requisites	Instructor	Credits	Hours	Offered
AHSE 4190	AHSE Capstone	Permission of Instructor(s)		AHS Staff	4 AHS	4-0-8	Fall and Spring
AHSE 4199	Special Topics in Arts, Humanities and Social Sciences				AHS		
AHSE 4590	Entrepreneurship Capstone	Permission of Instructor(s)		Bourne, Schiffman	4 AHSE	2-0-10	Fall and Spring
ENGR 1110	ICB1 Engineering: Modeling and Control of Compartment Systems		SCI 1110 and MTH 1110	G. Pratt, Storey	3 ENGR	3-3-3	Fall
ENGR 1120	ICB2 Engineering: Modeling and Control of Spatially Distributed Systems		SCI 1120 and MTH 1120	G. Pratt, Storey	3 ENGR	3-3-3	Spring
ENGR 1200	Design Nature			Eris, Linder, Staff	4 ENGR	6-4-2	Fall
ENGR 1510	Introductory Programming			Downey	2 ENGR	2-1-1	Fall
ENGR 2210	Principles of Engineering	ENGR 1120		Minch, G. Pratt	4 ENGR	4-4-4	Fall and Spring
ENGR 2250	User Oriented Collaborative Design			Eris, Linder, Staff	4 ENGR	4-4-4	Spring
ENGR 2410	Signals and Systems			Dabby	4 ENGR	2-2-8	Spring
ENGR 2420	Introduction to Microelectronic Circuits	ENGR 1120		Minch	4 ENGR	4-4-4	Spring
ENGR 2510	Software Design			Downey, Stein	4 ENGR	5-0-7 (F) 6-0-6 (S)	Fall and Spring
ENGR 3210	Sustainable Design	ENGR 2250		Linder	4 ENGR	4-0-8	Fall
ENGR 3220	Human Factors and Interface Design	ENGR 2250		Stein	4 ENGR	4-4-4	Fall or Spring
ENGR 3230	Useable Products: Analyzing the User Experience for Redesign	ENGR 2250		Eris	4 ENGR	4-4-4	Spring
ENGR 3310	Transport Phenomena	ICB2		Townsend	4 ENGR	4-0-8	Fall
ENGR 3320	Mechanics of Solids and Structures	ICB1		Storey, Miller	4 ENGR	4-4-4	Spring
ENGR 3330	Mechanical Design	ICB2	ENGR 3320	Barrett	4 ENGR	4-4-4	Fall
ENGR 3335	Mechanical Vibrations	MTH 2120, MTH 2140		Lee	4 ENGR	4-0-8	Fall
ENGR 3340	Dynamics	ICB1		Bingham	4 ENGR	4-4-4	Fall
ENGR 3350	Thermodynamics			Storey, Townsend	4 ENGR	4-0-8	Spring
ENGR 3355	Renewable Energy	ENGR 3350		Townsend	4 ENGR	4-0-8	Fall
ENGR 3360	Topics in Fluid Dynamics		ENGR 3310	Storey	4 ENGR	4-0-8	Spring
ENGR 3370	Controls	ENGR 3340		Bingham	4 ENGR	4-0-8	Spring

Number	Name	Prerequisites	Co-requisites	Instructor	Credits	Hours	Offered
ENGR 3380	Design for Manufacturing	ENGR 2250		Barrett	4 ENGR	4-0-8	Spring
ENGR 3390	Robotics			Barrett, G. Pratt	4 ENGR	4-0-8	Spring
ENGR 3410	Computer Architecture	ICB2		Chang	4 ENGR	4-4-4	Fall
ENGR 3420	Introduction to Analog and Digital Communications	ENGR 2410		TBA	4 ENGR	4-4-4	Fall
ENGR 3425	Analog VLSI	ENGR 2420		Minch	4 ENGR	4-4-4	Alt Fall (odd years)
ENGR 3430	Digital VLSI	ICB2		Chang	4 ENGR	4-4-4	Spring
ENGR 3440	Modern Sensors	ICB2, ENGR 2410		Somerville	4 ENGR	4-4-4	TBA
ENGR 3450	Semiconductor Devices	ICB2; SCI 1410 or SCI 3110		Somerville	4 ENGR	4-4-4	TBA
ENGR 3520	Foundations of Computer Science	ENGR 2510	MTH 2110	Stein	4 ENGR	4-0-8	Every 3rd semester (beginning Fall 04)
ENGR 3520A	Foundations of Computer Science Project		ENGR 3520	Stein	2 ENGR	1-0-5	Every 3rd semester (beginning Fall 04)
ENGR 3525	Software Systems			Downey	4 ENGR	4-4-4	Every 3rd semester (beginning Spring 05)
ENGR 3530	Synchronization			Downey	2 ENGR	2-2-2	Every 3rd semester (beginning Spring 05)
ENGR 3540	Computational Modeling	ENGR 2510		Downey	4 ENGR	4-0-8	Every 3 years (beginning Fall 05)
ENGR 3550	Computer Systems and Public Policy			TBA	2 AHS + 2 ENGR	4-0-8	TBA
ENGR 3600	Topics in BioEngineering			Staff	4 ENGR	4-4-4	Fall
ENGR 3699	Special Topics in BioEngineering				ENGR		
ENGR 3710	Systems	Completion of other E:SYS requirements		Bingham, G. Pratt	4 ENGR	4-0-8	Fall
ENGR 3810	Structural Biomaterials	SCI 1410	SCI 1210	Chachra	4 ENGR	4-4-4	Fall
ENGR 3820	Failure Analysis and Prevention	SCI 1410		Stolk	4 ENGR	4-4-4	Spring
ENGR 3830	Phase Transformation in Ceramic and Metallic Systems	SCI 1410		Stolk	4 ENGR	4-4-4	Fall

Number	Name	Prerequisites	Co-requisites	Instructor	Credits	Hours	Offered
ENGR 4190	Senior COnsulting Program for Engineering (SCOPE)		Must be Senior	Staff	4 ENGR	1-0-11	Fall and Spring
ENGR 4190A	Senior COnsulting Program for Engineering (SCOPE)		Open to non-Olin students	Staff	variable 2 or 4	1-0-11 (4) 1-0-5 (2)	
MEC 1000	Fundamentals of Machine Shop Operations			Anderson	4 Non-degree	6-0-6	Fall and Spring
MTH 1110	ICB1 Math: Calculus		SCI 1110 and ENGR 1110	Geddes, Tilley	2 MTH	2-0-4	Fall
MTH 1120	ICB2 Math: Vector Calculus		SCI 1120 and ENGR 1120	TBA	2 MTH	2-0-4	Spriing
MTH 2110	Discrete Mathematics			Adams	4 MTH	4-0-8	Fall
MTH 2120	Linear Algebra			Moody, Adams, Tilley	2 MTH	2-0-4	Fall and Spring
MTH 2130	Probability and Statistics			Moody, Adams, Tilley	2 MTH	2-0-4	Fall and Spring
MTH 2140	Differential Equations	ICB2		Moody	2 MTH	2-0-4	Fall and Spring
MTH 2160	Introduction to Mathematical Modeling	MTH 1110		Tilley	2 MTH	2-0-4	Spring
MTH 3120	Partial Differential Equations	MTH 2120, MTH 2140		Tilley	4 MTH	4-0-8	Fall
MTH 3130	Mathematical Analysis	ICB2		Moody	2 MTH	2-0-4	TBA
MTH 3140	Error Control Codes	MTH 2120, MTH 2110		Adams	2 MTH + 2 ENGR	4-0-8	Spring
MTH 3150	Numerical Methods and Scientific Computing	MTH 2120, MTH 2140		Tilley	4 MTH	4-0-8	Spring
MTH 3160	Introduction to Complex Variables	ICB2, MTH 2140		Tilley	4 MTH	4-0-8	Fall*
MTH 3170	Nonlinear Dynamics and Chaos	MTH 2120, MTH 2140		Geddes	4 MTH	4-0-8	Spring
SCI 1110	ICB1 Physics: Mechanics		MTH 1110 and ENGR 1110	Somerville, Christianson	3 SCI	3-0-6	Fall
SCI 1120	ICB2 Physics: Electromagnetism and Waves		MTH 1120 and ENGR 1120	Christianson, Zastavker	3 SCI	3-0-6	Spring
SCI 1210	Principles of Modern Biology (with laboratory)			J. Pratt, Donis-Keller	4 SCI	4-3-5	Fall and Spring
SCI 1310	Introduction to Chemistry (with laboratory)			TBA	4 SCI	4-3-5	Fall
SCI 1410	Materials Science and Solid State Chemistry (with laboratory)			Chachra, Stolk Christianson	4 SCI	4-4-4	Fall Spring

Number	Name	Prerequisites	Co-requisites	Instructor	Credits	Hours	Offered
SCI 2110	Biological Physics	ICB1, ICB2		Zastavker	4 SCI	4-0-8	TBA
SCI 2120	Biological Thermodynamics	ICB1, ICB2		Zastavker	4 SCI	4-0-8	Spring
SCI 2210	Immunology	SCI 1210		J. Pratt	4 SCI	4-0-8	Fall
SCI 2320	Organic Chemistry (with laboratory)			TBA	4 SCI	4-4-4	Spring
SCI 3110	Modern Physics	ICB2		Holt	4 SCI	4-0-8	Fall
SCI 3120	Solid State Physics	SCI 3110	SCI 3110	Christianson	4 SCI	4-0-8	Alt Spring, (odd years)
SCI 3130	Advanced Classical Mechanics	ICB2, MTH 2120 MTH 2140		Zastavker	4 SCI	4-0-8	Alt Fall
SCI 3210	Human Molecular Genetics in the Age of Genomics	SCI 1210 or BISC 219 (Wellesley)		Donis-Keller	4 SCI	4-0-8	Fall

Course Listings

Integrated Course Block (ICB) 1:

MTH 1110
ICB 1 Math: Calculus

Instructor(s): Geddes, Tilley
Credits: 2 MTH
Hours: 2-0-4
Co-requisites: SCI 1110 and ENG 1110
Usually Offered: Fall

An overview of differential and integral calculus in the context of elementary numerical analysis.

SCI 1110
ICB 1 Physics: Mechanics

Instructor(s): Somerville, Christianson
Credits: 3 SCI
Hours: 3-0-6
Co-requisites: MTH 1110 and ENG 1110
Usually Offered: Fall

This course provides a thorough introduction to classical mechanics. We will cover kinematics, the basis of Newton's laws, particle dynamics, the concepts of momentum, work, energy, and rotational motion, and oscillations. Additionally, the course will establish the basics of solid and fluid mechanics, concluding with introductory topics in thermodynamics. Our goal is to share with you the excitement of discovering the material universe at its most basic levels and to equip you with the basic knowledge and analytical skills necessary to become a scientist or an engineer.

ENGR 1110
ICB 1 Engineering: Modeling and Control of Compartment Systems

Instructor(s): G. Pratt, Storey
Credits: 3 ENGR
Hours: 3-3-3
Co-requisites: MTH 1110 and SCI 1110
Usually Offered: Fall

A hands-on class in the modeling and control of compartment systems, including first and second order thermal, mechanical, and electrical systems, the nature of effort and flow (across and through state variables) as universal concepts, power and energy, impedance, damping, passivity, qualitative feedback stability, and hysteretic, P, PI, and PID control. Students will also learn to use MATLAB, to use Simulink, and to write basic real-time control and simulation software.

Integrated Course Block (ICB) 2:

MTH 1120
ICB 2 Math: Vector Calculus

Instructor(s): TBA
Credits: 2 MTH
Hours: 2-0-4
Co-requisites: SCI 1120 and ENG 1120
Usually Offered: Spring

An overview of differential and integral calculus in higher dimensions. Topics include surfaces, partial differentiation, gradients, multiple integrals, line integrals, Green's, Divergence, and Stokes' theorems, and their applications to science and engineering.

SCI 1120
ICB 2 Physics: Electromagnetism and Waves

Instructor(s): Christianson, Zastavker
Credits: 3 SCI
Hours: 3-0-6
Co-requisites: MTH 1120 and ENG 1120
Usually Offered: Spring

Electricity and magnetism, including electric

charges, forces, and fields, Gauss's Law, potential, electrostatic energy and capacitors, magnetic fields and energy, mutual and self induction, Ampere's Law, Maxwell's Equations, acoustic and electromagnetic waves, polarization, interference and diffraction.

ENGR 1120
ICB 2 Engineering: Modeling and Control of Spatially Distributed Systems

Instructor(s): G. Pratt, Storey
Credits: 3 ENGR
Hours: 3-3-3
Co-requisites: MTH 1120 and SCI 1120
Usually Offered: Spring

A hands-on class in the modeling and control of spatially distributed systems, including thermal diffusion in 1D and 2D, the heat equation, the wave equation, characteristic impedance and wave velocity, simple (Cartesian grid) finite difference analysis, acoustic transmission lines, electrical transmission lines, termination and wave reflection.

Arts, Humanities, Social Science, and Entrepreneurship

AHSE 0112
The Olin Conductorless Orchestra

Instructor(s): Dabby
Credits: 1 AHS
Hours: 2-0-1
Prerequisites: Audition
Usually Offered: Fall and Spring
Pass/No Credit Grading Type

The Olin Conductorless Orchestra (OCO) — an ensemble, minus conductor — features instrumentalists in leadership and collaborative roles. Dedicated to orchestral performance in the concerted spirit of chamber music, the orchestra forges individual participation, active listening, and group-motivation into performances that have established it as the only conductorless orchestra of its kind at an American college. (A student can apply up to 4 OCO credits to the 28 required credits in AHSE, or can petition to apply up to 4 OCO credits to the AHS concentration. Any additional credits, i.e., more than 4, earned by a student enrolling in OCO will show up as additional AHS credits, but will not count toward satisfying the requisite 28 credits in AHSE.)

AHSE 1100
History of Technology: A Cultural and Contextual Approach

Instructor(s): Martello
Credits: 4 AHS
Hours: 4-0-8
Usually Offered: Fall

This course operates on three levels of inquiry and exploration. In the most detailed sense, we look at several major History of Technology themes, such as Technological Systems, Technology and Culture, and Technology and the Environment. We address larger historical questions, such as the interpretation of evidence and the combination of analysis and narrative. Finally, we conduct writing, presentation, creativity, and analysis exercises that contribute to competencies such as communication and contextual understanding.

AHSE 1101
History and Society

Instructor(s): TBA
Credits: 4 AHS
Hours: 4-0-8
Usually Offered: Fall

That the United States is a "nation of immigrants" is a truism ingrained in American culture and public disclosure. To it we might add another: Americans are people "on the move." If such characterizations are commonplace, however, unpacking them is anything but simple. This course endeavors to unpack these ideas, introducing students to college-level work in the Liberal Arts through an exploration of the construction of "American" identity in the 20th century.

AHSE 1102
Arts and Humanities

Instructor(s): TBA
Credits: 4 AHS
Hours: 4-0-8
Usually Offered: Fall

In AHSE 1102 we will observe, explore, and analyze how art (literary and visual) and philosophy grapple with self-identity and the boundaries of the self in the last 200 years. More specifically, we will explore the following questions:

- How do artists and philosophers imagine both the possibilities and the boundaries available to the self?
- How do artists and philosophers interrogate sets of values associated with identities available to the self?
- How do the forms and voices that artists and philosophers take up or invent enable new ways of being?

In the first half of the course, we will focus on artists and philosophers from 19th century Europe and America grappling with powerful political, economic, social, and cultural forces. In the second half we will focus on contemporary artists and philosophers who explore these same powerful forces from postcolonial and postmodern perspectives.

AHSE 1122
The Wired Ensemble: Instruments, Voices, Players

Instructor(s): Dabby
Credits: 4 AHS
Hours: 4-0-8
Prerequisites: Ability to read music
Usually Offered: Fall

Two concurrent streams comprise The Wired Ensemble: composition and performance of original works for instruments and voices; and exploration of composers through their letters.

As composers and performers, students concentrate on instruments, voices, and the symbolic language that brings them to life. They compose music for every family of instruments (woodwinds, brass, strings, percussion) and for voices, with semiweekly performances of original compositions by fellow musicians. Students also have the opportunity to hear their works performed in concert settings by professional and student musicians with whom they have collaborated. Seminar trips to Boston and New York enable the class to gather musical and inspirational material, as well as to hear some of the finest orchestral and vocal ensembles in performance. While actively engaged in composition, performance, and recording — all geared to an end-of-term production — students examine the worlds of earlier composers in order to provide context for their own lives and work. To read many of the denumerable biographies of a Mozart, Schubert, Debussy, or Bartók presents these luminaries through the scholarly lens of a story teller. Yet, to peruse their letters ushers the reader into a rarefied world of personal thoughts, goals, desires, in conjunction with the prosaic affairs of everyday life. For anyone who has dreamed of charting a creative path through life — whether as engineer, artist, scientist, and/or entrepreneur — these musicians, with their triumphs, setbacks, and emotional highs and lows, provide mentors for a lifetime. The Wired Ensemble is sponsored by Toscanini's Ice Cream.

AHSE 1130
Seeing and Hearing: Communicating with Photographs, Video and Sound

Instructor(s): Donis-Keller
Credits: 4 AHS
Hours: 4-0-8
Usually Offered: Fall

Seeing and Hearing is a foundation course that is about the communication of ideas developed by research, reflection, and evolving thought, using as a vehicle for expression contemporary digital media tools. In this project-based course, students will have opportunities for hands-on learning in audio recording and editing, photography and printing, and video recording and editing. Science and engineering content are integrated in order to provide a reasonably comprehensive understanding of

the devices we use to gather sound and images and in order to understand more fully the properties of seeing and hearing. A major goal is to enlarge our awareness of the environment we inhabit and to respond to the perceived environment by producing original visual and sonic artwork. Students will complete projects including a self-portrait, a sound-piece that is used as an audio track for a short video, a video documentary, and a staged narrative. Our process is to share work through discussion sessions as we follow projects from their initial stages to completion and final presentation. Additional context for Seeing and Hearing is provided by selected readings, visits by guest lecturers, additional faculty and staff participation and by viewing work of other professional practitioners. This course does not require prior experience with image/sound gathering or editing.

AHSE 1140
Culture & Difference: an Anthropological Approach

Instructor(s): Lynch
Credits: 4 AHS
Hours: 4-0-8
Usually Offered: Fall

This course introduces students to key concepts and methods in cultural anthropology. Cultural anthropology is the study of how humans organize their lives as members of society, and the ways in which they make these lives meaningful. Through readings on such diverse topics as adolescence in Samoa, epilepsy among Hmong-Americans, and McDonald's in Hong Kong, this course will explore contemporary anthropological approaches to three central questions: 1) What is culture? 2) Does "culture" explain why people do what they do and believe what they believe? 3) What fate and value do cultural differences have in today's interconnected world?

AHSE 1150
What is "I"?

Instructor(s): Stein
Credits: 4 AHS
Hours: 4-0-8
Usually Offered: Alt Fall (even years)

This interdisciplinary exploration of identity draws on a diverse range of genres in the Humanities, Social Sciences, Arts and Sciences. Prior offerings have drawn from Anthropology, Artificial Intelligence, Biology, Film, History, Literature, Memoir, Neuroscience, Philosophy, Psychology, Political Science, Science Fiction, Sociology, and Visual Arts. Our goal is to understand how individual perspective (or the illusion of same) comes into being and how our own unique perspectives shape the way that we see the world. Emphasis is placed on communication and context.

AHSE 1500
Foundations of Business and Entrepreneurship

Instructor(s): Bourne, Schiffman
Credits: 4 AHSE
Hours: 4-0-8
Usually Offered: Fall and Spring

The course is designed to provide Olin students with experience in planning and growing a business venture. The learning experience is centered on "doing" (e.g., engaging in a business simulation) while building a student's competence in the functional areas of business including accounting, finance, marketing, and strategy.

AHSE 2110
The Stuff of History: Materials and Culture in Ancient, Revolutionary and Contemporary Times

Instructor(s): Martello
Credits: 4 AHS
Hours: 4-0-8
Co-requisites: SCI 1410 Section 2
Usually Offered: Alt Fall (even years)

The lion's share of our history of technology course features a series of readings, lectures,

and discussions on the relationship between materials, science, society, and the environment in three historical periods. We start with the material practices and paradigms of Copper and Bronze Age societies, shift to Paul Revere's "Revolutionary" work with various metals and fabrication processes, and conclude with a look at the technologies and challenges of tomorrow. We will emphasize the development of three skills that are vital to our studies: contextual thinking, communication (both written and oral), and historical research methods pertaining to source evaluation and narrative construction.

AHSE 2112
Six Books that Changed the World

Instructor(s): Martello
Credits: 2 AHS
Hours: 4-0-8
Pre/Co-requisites: AHS Foundation
Usually Offered: Spring (first half)

Why and how do certain books reshape the course of human history? In this course, we will explore six books, selected from different times, societies, and genres, that have had an unquestionably major impact upon the world in which we live. Class meetings will alternate between contextual studies of the historical context of each book (including the author's background, the political and social setting, and other factors) and careful analyses of the works themselves. Our discussions will investigate each book's contemporary and modern impact while also exploring the qualities that caused all of our selections to have such an enduring and global effect. Students will be expected to contribute to class discussions, make presentations, and write a report on an additional book of their choosing. NOTE: this course will be offered during the first half of the spring semester, will meet twice a week, and will require approximately 12 hours of student effort each week

AHSE 2114
Science Fiction and Historical Context

Instructor(s): Martello
Credits: 2 AHS
Hours: 4-0-8
Pre/Co-requisites: AHS Foundation
Usually Offered: Spring (second half)

Science fiction is a wonderful genre that somehow captures a society's ideals, fears, assumptions, and major challenges. In the same way that a historian attempts to piece together complex cause-effect chains to make sense of the past, science fiction writers project the values, technologies, and beliefs of their own societies into alternate or future realities. Our class will work together to understand the conventions of science fiction and explore science fiction works (books, short stories, film) produced in different times, across various cultures, and in different sub-genres of this field. Students will have the opportunity to analyze different works of science fiction through writings and class discussions, and can also choose to develop a science fiction idea of their own. NOTE: this course will be offered during the second half of the spring semester, will meet twice a week, and will require approximately 12 hours of student effort each week.

AHSE 2120
Heroes for the Renaissance Engineer: Leonardo, Nabokov, Bach, Borodin

Instructor(s): Dabby
Credits: 4 AHS
Hours: 3-0-9
Usually Offered: Alt Spring (odd years)

To what extent have artists exhibited extraordinary knowledge and ability in science? Does this necessarily infuse their art, and if so, how? Source documents provide the key focus for analysis and critical thought. Artists in the fields of literature, art, and music include Vladimir Nabokov (writer and lepidopterist), Leonardo da Vinci (artist and engineer), Alexander Borodin (composer and chemist), and J. S. Bach (composer, performer, and acoustician). Each of these achieved a self-sufficiency enabling the articulation and real-

ization of work that reveals a singular vision, shaped in part by fluency in both technical and artistic disciplines. Class trips to concerts and museums in Boston and New York enable students to explore firsthand the works of these individuals. Students also have the opportunity to realize projects that meld the arts and sciences in order to experience firsthand the satisfaction and challenges faced by Bach, Borodin, Nabokov, and Leonardo in their desire for knowledge, discovery, and creative expression.

AHSE 2130
The Intersection of Art and Science

Instructor(s): Donis-Keller
Credits: 4 AHS
Hours: 4-0-8
Usually Offered: Alt Fall (even years)

Science and Art are often considered entirely different worlds inhabited by practitioners who have nothing in common. In this course, we will debunk this myth by closely examining the discovery process in both disciplines and by comparing the culture of science to that of art, historically and in the present. We will consider the influence of scientific discoveries, from optics to “new media” on the production of art and discuss the corollary question “Has art influenced the progress of science?” We will also consider ways in which science allows us to understand artists and the work they create. In contemporary society artists have begun to comment on science, sometimes with disastrous results, which leads us to ask, “What is needed in order to establish a meaningful dialogue between scientists and artists, and, does it matter?”

AHSE 2131
Responsive Drawing and Visual Thinking

Instructor(s): Donis-Keller
Credits: 4 AHS
Hours: 4-0-8
Usually Offered: Fall

The course assumes no prior experience in drawing. Students will learn to visualize objects in three-dimensional space and commit them to the two-dimensional space of a page, gaining critical experience with "idea sketching," an ability that can be put to many uses in future courses (e.g. project design). Students will also draw subjects from life, i.e. stationary objects and life models using media including charcoal, graphite, conte, and ink. The emphasis will be realistic depiction as compared to non-objective abstraction. Students will begin with basic exercises in drawing and rapidly move to more complex intensive drawing experiences. Approximately one-third of the classroom time will be used for drawing from a life model. Class discussion and sketchbook homework assignments will be an essential element in the learning process. Homework assignments will include drawing and visual thinking exercises to be completed in personal sketchbooks. Reading selected text material is also part of the homework requirement. Several invited speakers will contribute to the course and provide informal critiques of student work. One filed trip is planned to the Fogg Art Museum at Harvard University in Cambridge to view art. Other in-class activities will include participation in discussion of drawings (old master and contemporary) that are presented to illustrate various objectives of classroom work (e.g. use of line to indicate form) and group critique sessions. Assessment will be based on weekly homework assignments, classroom work, and three drawing projects to be completed outside of class.

AHSE 2140
Anthropology: Culture, Knowledge and Creativity

Instructor(s): Lynch
Credits: 04 AHS
Hours: 4-0-8
Prerequisites: AHS Foundation
Usually Offered: Spring

Anthropological theories and methods help us understand human behavior and values. Broadly speaking, anthropologists ask, “Why do people do what they do and believe what they believe?” Today anthropologists study a wide range of contemporary social issues, such as international development, garment manu-

facturing, the production of scientific knowledge, female "circumcision," and intellectual property. In this course, we will read about, debate, and discuss these and other issues in order to probe into the meanings of culture, knowledge, and creativity.

- What do anthropologists mean by culture?
- What does it mean to take cultural difference seriously?
- Does culture have an influence on what is considered legitimate "knowledge"?
- If knowledge is "situated," what happens when one form of knowledge comes in contact with another (for instance in discussions of global human rights)?
- What is the relationship between cultural difference, situated knowledge, and human creativity?
- Does globalization threaten to destroy creativity, stifle innovation, and erase difference?

After we learn how anthropologists deal with these questions at a range of research sites, we will end the course with our own anthropological studies that utilize what we have learned earlier in the course. Students will conduct short research projects that examine social issues pertaining to the use of the Internet in the United States. By ending with a study of ourselves, students will see how creative we really are; that we, too, have culture; and that what we consider legitimate knowledge is culturally situated. The professor will assume no prior knowledge of anthropology. Skills to be developed include critical reading, critical thinking, writing and analysis, presenting arguments in oral and visual form, and working on projects in small groups. The following texts will be used, among others: Jean Davison, *Voices from Mutira: Change in the Lives of Gikuyu Women*, Daniel Miller and Don Slater, *The Internet: An Ethnographic Approach*, Jeremy MacClancy, *Exotic No More: Anthropology on the Front Lines*.

AHSE 4190
Arts, Humanities, Social Science (AHS) Capstone

Instructor(s): Dabby, Lynch, Martello, Stein
Credits: 4 AHS
Hours: 4-0-8
Prerequisites: Permission of the Instructor(s)
Usually Offered: Fall and Spring

The AHS Capstone is an advanced, self-designed AHS project that builds upon a student's prior experience in one or more AHS disciplines. All students must complete either an AHS Capstone or an Entrepreneurship Capstone in order to graduate. AHS Capstones must be proposed to the AHS Committee and approved by the end of the academic year prior to the Capstone (in this case, by spring of 2005) except in extenuating circumstances. Additional information on the AHS Capstone is available at http://projects.olin.edu/ahs. AHS Capstone students will complete a proposal, a journal, a disciplinary deliverable, an analysis of their deliverable, and a presentation. Class sessions will vary between "plenary" meetings of all students and faculty, small group workshops, and individual meetings. Please contact the AHS Committee at ahs@lists.olin.edu with any questions.

AHSE 4590
Entrepreneurship Capstone

Instructor(s): Bourne, Schiffman
Credits: 4 AHSE
Hours: 2-0-10
Prerequisites: Permission of the Instructor(s)
Usually Offered: Fall and Spring

The Entrepreneurship Capstone is an advanced, self-designed project that builds upon a student's prior experience in business and entrepreneurship. All students must complete either an AHS Capstone or an Entrepreneurship Capstone in order to graduate. Entrepreneurship Capstones must be proposed to the Entrepreneurship Committee and approved by the end of the academic year prior to the Capstone (in this case, by spring of 2005) except in extenuating circumstances. Normally, an Entrepreneurship Capstone student will

engage in a team or individual project to build and/or execute a plan to bring a new organization, product or service into being. For this reason, a course on Entrepreneurship and New Ventures is normally expected as a prerequisite to enrolling in the Entrepreneurship Capstone. Courses that satisfy this prerequisite include Babson's EPS3501 or EPS3501T and Olin's AHSE 3599 Special Topics in Business and Entrepreneurship: Technology and New Ventures. If you are planning to enroll in the Entrepreneurship Capstone, and have not yet completed this prerequisite, it is strongly suggested you enroll in AHSE 3599. Class sessions for the Entrepreneurship Capstone will consist of seminar style "plenary" sessions as well as other pedagogical modalities as appropriate. If choosing the Entrepreneurship Capstone track, a student must also complete 8 additional "depth" credits in business or entrepreneurship. The New Ventures course counts for 4 of those credits. Please contact Steve Schiffman with any questions.

Engineering

ENGR 1110

See ICB 1 (top of listings)

ENGR 1120

See ICB 2 (top of listings)

ENGR 1200
Design Nature

Instructor(s): Eris, Linder, Staff
Credits: 4 ENGR
Hours: 6-4-2
Usually Offered: Fall

We take nature, an important source of inspiration and understanding, as a theme and develop bioinspired ideas into functional prototypes. Our focus is on the general principles and methods that shape the practice of engineering design. Students complete individual and team projects in a studio environment where we seek to develop a shared practice and understanding of engineering design. Students also gain experience in visualization, experimentation, estimation, fabrication, and presentation as they relate to designing.

ENGR 1510
Introductory Programming

Instructor(s): Downey
Credits: 2 ENGR
Hours: 2-1-1
Usually Offered: Fall

This class is an introduction to basic programming intended for students with little or no programming experience. It develops basic programming and debugging skills, and covers concepts including variables and values; procedures, parameters and arguments; lists, dictionaries and other collections; and basic algorithms including map, filter and reduce.

Students completing this class successfully will be well-prepared for Software Design

ENGR 2210
Principles of Engineering

Instructor(s): Minch, G. Pratt
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ENGR 1120
Usually Offered: Fall + Spring

Through a significant project experience, students will learn to integrate analysis, qualitative design, quantitative optimization, experiments, and simulations to improve their ability to engineer real systems. In each section of the course, students will work in small multidisciplinary teams to design and to build a mechatronic system of their own choosing. Each project must include both a nontrivial mechanical system design and a nontrivial electronic system design involving both hardware and software components. Projects will be subject to realistic materials, process, and budgetary constraints

ENGR 2250
User Oriented Collaborative Design

Instructor(s): Eris, Linder, Staff
Credits: 4 ENGR
Hours: 4-4-4
Usually Offered: Spring

Students develop detailed concepts and models of authentic new products and services. Our focus is on user-oriented, collaborative approaches to design and seeking holistic solutions integrating user and functional perspectives. We emphasize the importance of process and the development of strategies. Students observe and engage people to develop a deep understanding of their values and the patterns of their lives. They work collaboratively in a studio environment to create a shared understanding of the people they design for (and with) and the product ideas they develop. Topics covered include design thinking, ethnographic methods, concept development and interaction design.

ENGR 2410
Signals and Systems

Instructor(s): Dabby
Credits: 4 ENGR
Hours: 2-2-8
Usually Offered: Spring

Signals (functions of one or more independent variables) and Systems (devices that perform operations on signals) presents fundamental concepts that arise in a variety of fields. The ideas and techniques associated with these concepts inform such diverse disciplines as biomedical engineering, acoustics, communications, aeronautics and astronautics, circuit design, and the arts, humanities, and social sciences. Topics include transforms (Z, Laplace, Fourier), frequency analysis, convolution, FIR and IIR systems, stability, generalized functions, modulation (AM and FM), sampling, and digital filtering.

ENGR 2420
Introduction to Microelectronic Circuits

Instructor(s): Minch
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ENGR 1120
Usually Offered: Spring

This course will cover elements of linear circuits, such as the operation of basic circuit elements, fundamental circuit laws, and analytic techniques in both the time domain and the frequency domain. It will also cover the transistor-level design of complementary metal-oxide-semiconductor (CMOS) electronic circuits in the context of modern integrated-circuit technology. The course will include an introduction to the fabrication and operation of metal-oxide-semiconductor (MOS) transistors and to the design and operation of the basic building blocks of analog integrated circuits including single-transistor amplifier stages, current mirrors, cascodes, differential pairs, and single-stage operational amplifiers. Throughout the course, an emphasis will be placed on design-oriented circuit analysis techniques and developing circuit reasoning skills.

ENGR 2510
Software Design

Instructor(s): Downey, Stein
Credits: 4 ENGR
Hours: 5-0-7 (Fall); 6-0-6 (Spring)
Usually Offered: Fall and Spring

This course is an introduction to software design. This course focuses on a model of computation as a set of simultaneous ongoing entities embedded in and interacting with a dynamic environment, for example: computation as it occurs in spreadsheets, video games, web applications, and robots. A major component of the class is a weekly three-hour, in-class laboratory. Much of this laboratory is spent in collaborative work on program development, with an emphasis on student-student interaction and student-student teaching, facilitated and enriched by the course staff. In addition, design and implementation work is supplemented with observational laboratory

assignments, inviting students to consider not only how to build a program, but how to anticipate its behavior and how to modify that behavior.

Both students with no prior background and students with background comparable to the CS AP should both find this course interesting and worthwhile.

ENGR 3210
Sustainable Design

Instructor(s): Linder
Credits: 4 ENGR
Hours: 4-0-8
Usually Offered: Fall

This course provides a comprehensive overview of sustainable product design. Emphasis is placed on learning and using green design principles, methods, tools and materials. Examples include life cycle assessment, eco-efficiency and eco-effectiveness. A system perspective highlighting material and energy flows over the complete product life cycle is used to structure course material. Students complete substantial reading, investigate existing products and develop their own product ideas.

ENGR 3220
Human Factors and Interface Design

Instructor(s): Stein
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ENGR 2250 User Oriented Collaborative Design (required); ENGR 2510 Software Design or other software development experience (recommended)
Usually Offered: Fall or Spring

A hands-on exploration of the design and development of user interfaces, taking into account the realities of human perception and behavior, the needs of users, and the pragmatics of computational infrastructure and application. Focuses on understanding and applying the lessons of human interaction to the design of usable computer applications; will also look at lessons to be learned from less usable systems. This course will mix studio (open project working time) and seminar (readings and discussion) formats.

ENGR 3230
Usable Products: Analyzing the User Experience for Redesign

Instructor(s): Eris
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ENGR 2250
Usually offered: Spring

What makes products usable? How can products be designed for usability? Students develop an in-depth understanding of product-user interactions by redesigning product concepts they have developed prior to taking the course for better usability. They identify the user requirements that drove the development of their product concepts, treat those requirements as hypotheses for a series of user experiments, and redesign their product concepts based on experimental findings. Video interaction and protocol analyses are introduced as research methodologies. Fundamental usability theories are covered.

ENGR 3310
Transport Phenomena

Instructor(s): Townsend
Credits: 4 ENGR
Hours: 4-0-8
Prerequisites: ICB2
Usually Offered: Fall

This course introduces the basic physics and applications of the transport of heat, mass, and momentum. Topics in fluid dynamics include kinematics, conservation laws, dynamic similarity, and laminar flow solutions. Topics in heat and mass transfer include internal and external convection, free convection, boiling and condensation, and the analogy between heat and mass transport. Applications in aerodynamics, geophysical flows, manufacturing processes, and biological systems will be discussed.

ENGR 3320
Mechanics of Solids and Structures

Instructor(s): Storey, Miller
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ICB1
Usually Offered: Spring

This course covers the principles of statics of structures and mechanics of materials. Topics include tension, compression, shear, torsion, bending, stresses, deflection, and strain in loaded members. Students will use a combination of analysis and simulation to understand the principles of mechanics. The course includes applications in structural engineering and machine elements. Students are introduced to the use of finite element methods as a tool for design and analysis.

ENGR 3330
Mechanical Design

Instructor(s): Barrett
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ICB2
Co-requisites: ENGR 3320
Usually Offered: Fall and Spring

This design course introduces new topics in machine design and applies and integrates the basic mechanical and thermal engineering sciences. Topics in machine element design include stress, strain, deflection, stiffness, and failure of mechanical components, steady and variable loading, mechanical fastening and joining, and the design of mechanical components, including springs, bearings, gears, shafts, and axles. The course includes a major design component that involves the fabrication and physical testing of mechanical components.

ENGR 3335
Mechanical Vibrations

Instructor(s): Lee
Credits: 4 ENGR
Hours: 4-0-8
Prerequisites: MTH 2120, MTH 2140
Usually Offered: Fall

This course is an intermediate treatment of the dynamics of elastic bodies. The following topics are covered: Derivation of equations of motion of rigid/elastic bodies using Newton/Euler; Lagrangian, and Hamilton's Principle formulations; Linearization and stability analysis; Time and frequency domain techniques for free and forced vibration of conservative and non-conservative single and multi-degree-of-freedom systems; Vibration of simple continuous systems; Introduction to concepts in random and nonlinear vibrations. Applications are drawn from areas ranging from structures to microdevices. Course assignments and projects include hands-on vibration measurements and computational simulation.

ENGR 3340
Dynamics

Instructor(s): Bingham
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ICB1
Usually Offered: Fall

This course contains the analytical and conceptual tools for understanding how mechanical, electrical, and electromechanical systems undergo changes in state. To analyze such systems we will apply both momentum and variational principles to derive the equations of motion. Hands-on demonstrations will illustrate the concepts behind these fundamental tools, and students will work on real-world examples from robotics, vehicle systems, spacecraft, and intelligent-structures.

Building on the ability to derive the equations of motion for rigid bodies, we extend the analysis to lumped parameter and continuous systems. This course will deliver generic tools for characterizing linear and nonlinear system behavior in the time and frequency domains.

The hands-on component of the course will explore the fundamental concepts of system dynamics: system modes (eigenvalues and vectors), spectrum analysis, and time response.

ENGR 3350
Thermodynamics

Instructor(s): Storey, Townsend
Credits: 4 ENGR
Hours: 4-0-8
Usually Offered: Spring

This course covers the fundamental principles of thermodynamics and physical chemistry as applied to engineering systems. This course provides a foundation in fundamental thermodynamic phenomena, including the first and second laws of thermodynamics, thermodynamic properties, equations of state in real and ideal gases, and chemical equilibrium. The basic laws are used to understand and analyze the performance and efficiency of systems, such as automobile engines, gas turbines, steam power plants, and refrigerators.

ENGR 3355
Renewable Energy

Instructor(s): Townsend
Credits: 4 ENGR
Hours: 4-0-8
Prerequisites: ENGR 3350
Usually Offered: Fall

Modern society relies on stable, readily available energy supplies. Renewable energy is an increasingly important component of the new energy mix. The course covers energy conversion, utilization and storage for renewable technologies such as wind, solar, biomass, fuel cells and hybrid systems and for more conventional fossil fuel-based technologies. Thermodynamics concepts (including the first and second law) will form the basis for modeling the renewable energy systems. The course also touches upon the environmental consequences of energy conversion and how renewable energy can reduce air pollution and global climate change. Transport Phenomena is recommended as a co-requisite, but not required.

ENGR 3360
Topics in Fluid Dynamics

Instructor(s): Storey
Credits: 4 ENGR
Hours: 4-0-8
Prerequisites: ENGR 3310
Usually Offered: Spring

This course will build upon the fundamentals learned in ENGR 3310 (Transport Phenomena) and discuss modern applications of fluid dynamics. The theme for the course will be advertised during course registration and will vary from year to year.

ENGR 3370
Controls

Instructor(s): Bingham
Credits: 4 ENGR
Hours: 4-0-8
Prerequisites: ENGR 3340
Usually Offered: Spring

This course explores the techniques for changing the dynamics of a system using feedback control. The first portion of the course covers methods for analyzing the open-loop dynamics of generic systems in the frequency-domain (transfer functions) and time-domain (state-space equations). Then we will develop feedback techniques for shaping the system response. Students completing this course will have the analytical tools for controller design (both classical and modern) as well as a fundamental understanding of the concepts behind feedback control (stability, performance, controllability, observability, etc.). Students will have ample opportunity to experiment with control design by implementing their own designs in analog and digital hardware. Examples from field robotics, aircraft, and intelligent-structures will be used for both in-class and hands-on demonstrations.

ENGR 3380
Design for Manufacturing

Instructor(s): Barrett
Credits: 4 ENGR
Hours: 4-0-8
Prerequisites: ENGR 2250
Usually Offered: Spring

This is a project-based course that introduces the principles of design for manufacturability and assembly. A variety of manufacturing processes will be covered with a special emphasis on injection molding. Students will design a part for injection molding, design the tool and then mold the parts in the Olin shop. A second project will involve the design or redesign of a product for high-volume manufacturing. There will also be case studies where product designers will visit the class and discuss one of their designs currently in production.

ENGR 3390
Robotics

Instructor(s): Barrett, G. Pratt
Hours: 4-0-8
Usually Offered: Spring

This course is taught much like a graduate seminar. Topics include perception, sensors, computer vision, navigation, localization, actuation, manipulation, mobility (e.g., walk, swim, roll, crawl, fly), and intelligence (e.g., control, planning, and mission execution). The course is built around the review and discussion of seminal technical papers in the robotics field with guest lectures both from various Olin faculty and from external leaders in the robotics community. The course will also include a project component to help solidify key concepts.

ENGR 3410
Computer Architecture

Instructor(s): Chang
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ICB2
Usually Offered: Fall

This course introduces a broad range of computation structures used in computation, from logic gates to specialized (e.g. DSP, cellular automata) as well as general purpose architectures. Design techniques for quantitatively optimizing performance are also taught. Students build a computer from the ground up.

ENGR 3420
Introduction to Analog and Digital Communications

Instructor(s): TBA
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ENGR 2410 or permission of Instructor
Usually Offered: Fall

This course teaches students design techniques for analog and digital communications, including elementary coding and information theory. Topics also include modulation schemes, data compression, error detection and correction, encryption, transmitter and receiver design, and routing protocols. Students build an operative communications link over an unreliable channel.

ENGR 3425
Analog VLSI

Instructor(s): Minch
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ENGR 2420
Usually Offered: Alt Fall (odd years)

This course will provide an overview of devices available to analog integrated circuit designers in modern complementary metal-oxide-semiconductor (CMOS) technologies: resistors, capacitors, metal-oxide-semiconductor (MOS) transistors, and bipolar junction transistors. It will cover the transistor-level design of linear analog integrated-circuit modules, such as operational amplifiers and operational transconductance amplifiers as well as layout techniques for analog integrated circuits. Students will work in small teams on a series of projects involving the design of analog inte-

grated circuit modules, culminating in the design of an analog system of moderate complexity, such as a filter or a data converter.

ENGR 3430
Digital VLSI

Instructor(s): Chang
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ICB2
Usually Offered: Spring

An introduction to digital CMOS design. Students will learn design techniques and layout their own custom integrated circuit, which will be fabricated by MOSIS.

ENGR 3440
Modern Sensors

Instructor(s): Somerville
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ICB2, ENGR 2410
Usually Offered: TBA

Modern topics in sensors, including sensor fabrication, physics, signal conditioning, and "smart" sensors. Students will conduct research on sensor technologies of their choosing, and implement a sensor system of their own design.

ENGR 3450
Semiconductor Devices

Instructor(s): TBA
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: ICB2; SCI 1410 or SCI 3110
Usually Offered: TBA

Introduction to semiconductor device fabrication, operation, and design. Emphasis on diodes and transistors, with some exploration of speculative technologies. Students will conduct a project of their own choosing involving either device characterization or device simulation using modern tools.

ENGR 3520
Foundations of Computer Science

ENGR 3520A
Foundations of Computer Science Project

Instructor(s): Stein
Credits: 4 ENGR (ENGR 3520); 2 ENGR (ENGR 3520A)
Hours: 4-0-8 (ENGR 3520); 1-0-5 (ENGR 3520A)
Prerequisites: ENGR 2510
Co-requisites: MTH 2110
Usually Offered: Every 3rd Semester (beginning Fall 04)

This course uses applications as vehicles for exploring the formal analytic toolkit of the computer scientist as well as aspects of algorithmic computing and intelligent software design. The course combines elements of automata theory, data structures and algorithms, programming languages, artificial intelligence, information management, and internet programming. Students may optionally enroll only in ENGR 3520; these students will be excused from the programming / project component of the course. Students wishing to register for the full six credit course should register for both ENGR 3520 and ENGR 3520A.

ENGR 3525
Software Systems

Instructor(s): Downey
Credits: 4 ENGR
Hours: 4-4-4
Usually Offered: Every 3rd Semester (beginning Spring 05)

An introduction to the design and implementation of system-level software, including operating systems, networks, and databases. Topics include processes and threads, memory and storage management, networking and interprocess communication, scheduling and synchronization.

ENGR 3530
Synchronization

Instructor(s): Downey
Credits: 2 ENGR
Hours: 2-2-2
Usually Offered: Every 3rd Semester (beginning Spring 05)

When multiple programs run at the same time, they can interact in complex ways, yielding unpredictable behavior at best and impenetrable bugs at worst. Synchronization is the process of imposing timing constraints in order to guarantee the correct execution of programs. This class presents a series of synchronization "puzzles" and gradually develops a set of tools for dealing with even the hairiest synchronization problems.

ENGR 3540
Computational Modeling

Instructor(s): Downey
Credits: 4 ENGR
Hours: 4-0-8
Prerequisites: ENGR 2510 or equivalent
Usually Offered: Every three Years (beginning Fall 05)

The availability of cheap computation has created a new way of understanding the world. Along with experiment and theory, computational modeling provides new tools for analysis, explanation and prediction. This class looks at the history of this revolution and the technology that underlies it. We will survey a range of literature, from the skeptical to the exuberant, and make a critical evaluation of this putative paradigm shift. Students will learn the skills of computational modeling, with an emphasis on discrete and stochastic models, and apply them to problems in a range of fields including engineering and the natural and social sciences. Basic programming ability, in any language, is a prerequisite.

ENGR 3550
Computer Systems and Public Policy

Instructor(s): TBA
Credits: 2 AHS + 2 ENGR
Hours: 4-0-8
Usually Offered: TBA

How do technical decisions influence human lives? How can engineering solutions change the terms of public policy debate? Through a series of case studies, this course looks at these questions in specific fields where computer technology and public policy intersect. In questions of privacy, security, safety (including public health), pornography, intellectual property and free speech, developments in computer systems technology either raise or offer solutions to significant public policy questions. This course builds ethics and context competencies and breadth in AHS. It also covers topics normally found in classes such as Operating Systems, Databases, Distributed Systems, Cryptography, Web Computing, and other Computer Science offerings.

ENGR 3600
Topics in BioEngineering

Instructor(s): Staff
Credits: 4 ENGR
Hours: 4-4-4
Usually Offered: Fall

Broadly, Bioengineering can be defined as the application of engineering concepts and methods to the solution and study of biological and medical problems. Using a case study approach, this course aims to provide students with a broad understanding of the types of problems Bioengineers explore as well as the engineering and biological methods they employ. We will approach topics through seminar-style discussion of current primary articles from the literature. Topics to be covered include tissue engineering, use of microfluidics devices for diagnostics, imaging disease states, and prosthetic limbs. In order to explore a topic of particular interest in more depth, students will also write and orally present a research paper on a topic of their choice.

ENGR 3710
Systems

Instructor(s): Bingham, G. Pratt
Credits: 4 ENGR
Hours: 4-0-8
Prerequisites: Completion of of other E:SYS requirements or permission of Instructor(s)
Usually Offered: Fall

This course introduces students to the art and science of interdisciplinary design. Students analyze the process used to develop example products that required expertise in many areas and creativity and trade-off consideration amongst all. Students learn about overarching principles that enable creators of broad interdisciplinary systems to succeed. Students will also work in teams and take on roles as design specialists in a variety of fields. Each team is given the task to design in detail a hypothetical product that can succeed only if interdisciplinary creativity is fostered and trade-offs are made by every team member, as well as the group as a whole.

ENGR 3810
Structural Biomaterials

Instructor(s): Chachra
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: SCI 1410
Co-requisites: SCI 1210
Usually Offered: Fall

How is a blood vessel like a garden hose?

Why are seashells strong (and beautiful) even though they are made of chalk? How can your pink and squishy tendons be made of the same material as your transparent corneas? This course focuses on the materials science of natural tissues, primarily ones that fill structural roles, including bone, teeth, tendon, nacre, and wood, with an emphasis on how they are similar and different to 'engineering' materials. Additional material may include scaffolds for tissue engineering, biomimetic materials and mechanical properties of individual cells.

ENGR 3820
Failure Prevention and Analysis

Instructor(s): Stolk
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: SCI 1410
Usually Offered: Spring

Students will complete projects and case studies to gain practical experience in the analysis of fractured and failed engineering materials and components. The course focus will be on material microstructure and the micromechanisms of fracture, and topics will include failure analysis methodology, mechanisms of failure, fracture classifications, corrosion and environmental factors, fractography, and design for failure prevention. Students will learn advanced materials characterization techniques including scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS) and compositional dot mapping, x-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), optical microscopy, and fracture surface sample preparation.

ENGR 3830
Phase Transformations in Ceramic and Metallic Systems

Instructor(s): Stolk
Credits: 4 ENGR
Hours: 4-4-4
Prerequisites: SCI 1410
Usually Offered: Fall

How can two brittle ceramics combine to make a toughened structure? How does a machinable steel transform into a high strength cutting tool? What drives solid-state reactions in powdered materials? Since properties of alloys and ceramics are largely determined by intrinsic material properties and microstructure, an understanding of phase transformations is essential for materials design and performance optimization. This course focuses on the thermodynamics and kinetics of phase transformations in the bulk and at interfaces and surfaces of multi-component materials systems. Topics include binary and ternary phase equilibria, atomic mobility, transformation kinetics, nucle-

ation and growth, heterogeneous reactions, surface and interfacial energy, diffusional and diffusionless transformations, phase stability, and microstructural development. Examples and laboratory activities highlight fundamental concepts and reinforce the practical importance of phase transformations in engineering ceramics and alloys.

ENGR 4190
Senior COnsulting Program for Engineering (SCOPE)

Instructor(s): Staff
Credits: 4 ENGR
Hours: 1-0-11
Co-requisites: must be a senior
Usually Offered: Fall and Spring

This course is a requirement for all Olin seniors. It incorporates formal, team-based, year-long engineering projects done in conjunction with 10 to 14 external companies. Each project will be executed by a single student team, supported by a dedicated faculty member, in partnership with one of these companies. Each student team will have between 3 and 8 members from the senior class. Students may conduct advanced research, perform market analysis, develop experimental prototypes, design new products or redesign existing products in the execution of this project.

ENGR 4190A
Senior COnsulting Program for Engineering (SCOPE)

Instructor(s): Staff
Credits: variable 2 or 4
Hours: 1-0-5 (2 credits) or 1-0-11 (4 credits)
Prerequisites: Permission of Instructor(s)
Usually Offered: Fall and Spring
NOTE: This is a registration option for non-Olin students.

This course incorporates formal, team-based, year long engineering projects done in conjunction with 10 to 14 external companies. Each project will be executed by a single student team, supported by a dedicated faculty member, in partnership with one of these companies. Each student team will have between 3 and 8 members from the senior class. Students may conduct advanced research, perform market analysis, develop experimental prototypes, design new products or redesign existing products in the execution of this project.

Machine Shop

MEC 1000
Fundamentals of Machine Shop Operations

Instructor(s): Anderson
Credits: 4 Non Degree (will not meet degree requirements)
Hours: 6-0-6
Prerequisites: Preference will be given those with prior machining and CAD experience
Usually Offered: Fall and Spring

The course focuses on the fundamentals of machine shop operations, the foundations for all classical machining techniques. In addition, we will cover necessary mechanical design elements and CAD techniques to equip you with the skills to help other students. No basics will be skipped! We will cover topics in proper breadth and depth to ensure that you come away with a sound understanding of machine shop safety, bench work, measurement, part layout, machine setup, operation and maintenance. We will also focus on design techniques and drawing creation using SolidWorks. Projects will be assigned to enforce these concepts and also provide many hours of machine time. There will be incentives to entice you to work professionally, learn how to interpret and establish appropriate design requirements and make parts to specification. Additionally you will learn how to inspect parts to ensure they meet specification. Time permitting — there will be field trips to local establishments to expand your horizons.

Math

MTH 1110

See ICB1 (top of listings)

MTH 1120

See ICB 2 (top of listings)

MTH 2110
Discrete Mathematics

Instructor(s): Adams
Credits: 4 MTH
Hours: 4-0-8
Usually Offered: Fall

Topics for this course include combinatorics, number theory, graph theory, an emphasis on creative problem solving, and the ability to read and write rigorous proofs.

MTH 2120
Linear Algebra

Instructor(s): Moody, Adams, Tilley
Credits: 2 MTH
Hours: 2-0-4
Usually Offered: Fall and Spring

An introduction to the fundamental mathematical techniques and concepts used in solving linear systems of equations. Topics include matrices and vectors, Gaussian elimination, matrix inverses, transposes and factorizations, column, row, and nullspace of a matrix, rank of a matrix, determinants, and eigenvalues and eigenvectors.

MTH 2130
Probability and Statistics

Instructor(s): Moody, Adams, Tilley
Credits: 2 MTH
Hours: 2-0-4
Usually Offered: Fall and Spring

An introduction to probability and statistics, with applications to science, engineering, and social science. Topics include discrete and continuous probability distributions; moments; conditional probability; Bayes' Rule; point and interval estimation; hypothesis testing.

MTH 2140
Differential Equations

Instructor(s): Moody
Credits: 2 MTH
Hours: 2-0-4
Prerequisites: ICB2
Usually Offered: Fall and Spring

An introduction to the solution techniques of differential equations. Topics include mathematical modeling, solution techniques to linear and nonlinear first-order differential equations, characteristic solutions to linear constant coefficient second-order differential equations, solutions to homogeneous (unforced) and inhomogeneous (forced) second-order linear systems. Applications include modeling of physical systems.

MTH 2160
Introduction to Mathematical Modeling

Instructor(s): Tilley
Credits: 2 MTH
Hours: 2-0-4
Prerequisites: MTH 1110
Usually Offered: Spring

This course centers on the interdependency of mathematics and on the sciences and engineering. Through this codependency, knowledge of the specific discipline is better understood through the development of a mathematical description and its solution. Often, these descriptions are appropriate over a wide range of disciplines well beyond the original context of the first problem. Over the seven-week session, we look at individual cases in biology, chemistry, physics, fields of engineering and business to see how to formulate a mathematical description, and the techniques used for its solution. The course follows a case-study format, with modeling subjects chosen from the media (for example, the Science Times section of the *New York Times*).

MTH 3120
Partial Differential Equations

Instructor(s): Tilley
Credits: 4 MTH
Hours: 4-0-8
Prerequisites: MTH 2120 and MTH 2140
Usually Offered: Fall

An introduction to the solution methods of partial differential equations that arise in describing a wide variety of problems in engineering, such as in fluid dynamics, elasticity, electromagnetic wave propagation, and transport phenomena. The course begins with the solution of boundary-value problems in ordinary differential equations (Sturm-Liouville theory), and then develops into the fundamentals of Fourier analysis and the solutions to the heat, wave, and Laplace's equations on finite and infinite domains. Additional topics will be addressed at the discretion of the Instructor(s), examples of which include systems of hyperbolic equations, similarity solutions in infinite domains, or a brief introduction to numerical solutions.

MTH 3130
Mathematical Analysis

Instructor(s): Moody
Credits: 2 MTH
Hours: 2-0-4
Prerequisites: ICB2
Usually Offered: TBA

An introduction to real analysis; construction of the real number system; metric spaces and metric topology; compactness; connectedness; functions. Emphasis on mathematical rigor, logic, and proof.

MTH 3140
Error Control Codes

Instructor(s): Adams
Credits: 2 MTH + 2 ENGR
Hours: 4-0-8
Prerequisites: MTH 2120 (required), MTH 2110 or another proof-based math class
Usually Offered: Spring

Error-control codes are used to detect and correct errors that occur when data are transmitted across a noisy channel. This course provides an introduction to error-control codes, including linear, cyclic, binary, and non-binary codes. Mathematics such as modular arithmetic and introductory ring and field theory will be introduced and used extensively.

MTH 3150
Numerical Methods and Scientific Computing

Instructor(s): Tilley
Credits: 4 MTH
Hours: 4-0-8
Prerequisites: MTH 2120, MTH 2140
Usually Offered: Spring

The speed of modern computers has allowed simulation to become a very powerful tool in the design and analysis of systems in science and engineering. This power is easily misused and scientific computing is full of pitfalls. This course introduces students to methods useful for accurately simulating complex systems in the physical sciences and engineering. The first half of the course will focus on iterative techniques for solving algebraic systems, interpolation of functions, and advanced techniques for solutions to ordinary differential equations. The second half of the course focuses on an introduction to solutions to boundary-value problems and solutions to partial differential equations, with the students required to choose an application in science and engineering to solve in detail.

MTH 3160
Introduction to Complex Variables

Instructor(s): Tilley
Credits: 4 MTH
Hours: 4-0-8
Prerequisites: ICB2, MTH 2140
Usually Offered: Fall

This course provides an introduction to the analysis of functions in the complex plane. Topics include the Cauchy- Riemann equations, conformal mapping, Cauchy-Goursat theorem,

Taylor-Laurent series, the residue theorem, Nyquist criterion, continuation of analytic functions, and applications in science and engineering.

MTH 3170
Nonlinear Dynamics and Chaos

Instructor(s): Geddes
Credits: 4 MTH
Hours: 4-0-8
Prerequisite: MTH 2120, MTH 2140
Usually Offered: Spring

This course will focus on the modern theory of dynamical systems including both discrete and continuous processes. The course will emphasize both theory and applications. Theory topics might include, for example, linear and nonlinear stability theory, periodic solutions, bifurcation theory, chaos, and strange attractors. Applications discussed might include, for example, mechanical oscillators and biological oscillators.

Science

SCI 1110
See ICB 1 (top of listings)

SCI 1120
See ICB 2 (top of listings)

SCI 1210
Principles of Modern Biology (with laboratory)

Instructor(s): Donis-Keller, J. Pratt
Credits: 4 SCI
Hours: 4-3-5
Usually Offered: Fall and Spring

This course introduces students to the fundamental aspects of biological science including biochemistry, molecular biology, human molecular genetics, and cellular communication. Students gain experience with contemporary research methods and scientific reasoning through laboratory experiments. The relevance of Biology to the environment and health is emphasized.

SCI 1310
Introduction to Chemistry (with laboratory)

Instructor(s): TBA
Credits: 4 SCI
Hours: 4-3-5
Usually Offered: Fall

This course introduces students to the fundamental aspects of aqueous and solid state chemistry. Topics include stoichiometry, gas laws, atomic structure and bonding, atomic theory, quantum theory, acid/base chemistry, solubility, electrochemistry, kinetics, thermodynamics, and reaction equilibria.

SCI 1410
Materials Science and Solid State Chemistry (with laboratory)

Instructor(s): Chachra, Stolk, Christianson
Credits: 4 SCI
Hours: 4-4-4
Usually Offered: Fall and Spring

This laboratory-based course introduces students to the relationships among structure, processing, properties, and performance of solid state materials including metals, ceramics, polymers, composites, and semiconductors. Topics include atomic structure and bonding, crystallography, diffusion, defects, equilibrium, solubility, phase transformations, and electrical, thermal, and mechanical properties. Students apply materials science principles in laboratory projects that emphasize experimental design and data analysis, examination of material composition and structure, measurement and modification of material properties, and selection of materials for engineering applications.

SCI 2110
Biological Physics

Instructor(s): Zastavker
Credits: 4 SCI
Hours: 4-0-8
Prerequisites: ICBI and ICB2
Usually Offered: TBA

In this course, we will look at life as one of the many phenomena displayed by the universe in its evolution, and apply the laws of physics to understand these phenomena. In doing so, we will take a "reductionist" or simplified approach to investigate the big picture; i.e., we will explore basic biophysical mechanisms that make various living organisms and biological assemblies interesting to scientists and useful for engineers. We will aim to achieve an intuitive and a semi-quantitative understanding of physical phenomena ranging from electrosensing (the ability of some animals to sense external electric fields for navigation and the detection of prey and communication) and obesity to biomechanics of athlete performance and scaling theory, which provides us with information about beasts we have never seen, for example, dinosaurs. Based on physical laws, we will examine diseases ranging from the cataract of the eye to the formation of gallstones in gall bladder bile. In order to gain knowledge of these various phenomena, we will systematically investigate the properties of water, Brownian motion, dynamics and physiology of fluids, thermodynamics, biomechanics and bioenergetics, and the electrochemical potential. Although engineers spend their entire careers solving and optimizing various problems, nature has been doing this for much longer; therefore, a deep understanding of biophysical processes in nature can yield unforeseen solutions to countless scientific and engineering problems. In this course, we will learn how to learn from nature.

SCI 2120
Biological Thermodynamics

Instructor(s): Zastavker
Credits: 4 SCI
Hours: 4-0-8
Prerequisites: ICBI and ICB2
Usually Offered: Spring

This course provides an introduction to the study of energy transformations in biological systems as well as thermodynamics and kinetics of structure formation and association of biomolecules. Topics covered include energy and its transformation, the First Law of Thermodynamics, the Second Law of Thermodynamics, Gibbs Free Energy, statistical thermodynamics, binding equilibria and reaction kinetics, and a survey of other interesting areas of biological thermodynamics, particularly the origin of life on Earth. Statistical development of entropy and a more extensive coverage of chemical kinetics and ligand binding to macromolecules will provide students with knowledge of thermodynamics and kinetics that they will be able to apply to biological systems and use for research in scientific and bioengineering fields.

SCI 2210
Immunology

Instructor: J. Pratt
Credits: 4 SCI
Hours: 4-0-8
Prerequisites: SCI 1210 or equivalent
Usually Offered: Fall

Immunology is a relatively new science, and our understanding of our immune system is evolving at a rapid pace. When the immune system functions properly, infectious pathogens and potential cancer cells are destroyed. When our immune system malfunctions, normally harmless microorganisms can cause serious infections, autoimmune diseases or allergies can develop and cancer cells can evade immune surveillance and grow unchecked. In this lecture and discussion-based class, we will investigate the molecular and cellular mechanisms that control our immune responses. Current research in immunology

will be emphasized through analysis of primary literature and media articles.

SCI 2320
Organic Chemistry (with laboratory)

Instructor(s): TBA
Credits: 4 SCI
Hours: 4-4-4
Usually Offered: Spring

An introduction to the fundamentals of organic chemistry with an emphasis on applications in biology, biotechnology, synthetic polymers, and the environment. Topics include structure and bonding in organic compounds; chemical and physical properties of organic molecules and bulk organic materials; reaction mechanisms and kinetics; structure-reactivity relationships; chemical and physical transformations; synthesis of organic molecules; and characterization techniques.

SCI 3110
Modern Physics

Instructor(s): Holt
Credits: 4 SCI
Hours: 4-0-8
Prerequisites: ICB2
Usually Offered: Fall

Modern Physics is based upon a few fundamental ideas that allow the explanation of phenomena that seem to defy consistency with traditional (Newtonian) physics. The most important of these (in the context of engineering applications) are the principles of quantum mechanics and statistical mechanics. This course will introduce the basic concepts of Modern Physics, with particular application to atoms, molecules and the materials utilized in modern electronics.

SCI 3120
Solid State Physics

Instructor(s): Christianson
Credits: 4 SCI
Hours: 4-0-8
Prerequisite: SCI 3110
Usually Offered: Spring, alternate years (odd-numbered)

Why do metals conduct heat well while insulators do not? Why is silicon a better semiconductor than diamond, even though they have the same structure? Why is lead a good superconductor at low temperature, while copper is not? We will explore the current understanding of insulators, metals, semiconductors and superconductors through some of the basic tools of solid state physics, and will learn how to apply these tools to the novel materials being developed today.

SCI 3130
Advanced Classical Mechanics

Instructor(s): Zastavker
Credits: 4 SCI
Hours: 4-0-8
Prerequisite: ICB2, MTH 2120, MTH 2140
Usually Offered: Alt Fall (even years)

Classical mechanics revisited with the use of mathematical formulation that makes the "old and dusty" Newton's laws shine in all their beauty. Using differential equations and linear algebra tools, we will venture to look at things only hinted at in introductory physics: variational principles, the two-body problem, motion in accelerated frames, rigid body dynamics, oscillations, Lagrangian and Hamiltonian mechanics, continuum mechanics, nonlinear dynamics, and chaos.

SCI 3210

Molecular Genetics in the Age of Genomics

Instructor(s): Donis-Keller
Credits: 4 SCI
Hours: 4-0-8
Prerequisites: SCI1210 (Olin); BISC219 (Wellesley); or permission of the Instructor(s)
Usually Offered: Fall

It is now understood that many, if not the majority, of human disorders, including cancers, have an underlying genetic component. In this modern age of healthcare, we are expected to choose amongst an array of therapeutic options for ourselves and for our children rather than respond to specific directives from the medical establishment. In addition, we are called upon as voting citizens to make ethical decisions, e.g. the appropriateness of stem cell cloning. Therefore, it is in the interest of each person to learn more than the fundamentals of biology and genetics in order to make educated choices. In this course we will be concerned with the traditional concepts of human genetics including pedigree analysis, linkage mapping, Mendelian, multi-locus and complex traits, and genetic testing. However, for the most part, the course will view human genetics through a molecular lens. For example, the molecular basis of pathological conditions such as Huntington's disease, hypercholesterolemia, Fragile-X and others will be examined in detail, as will gene imprinting and imprinting-related abnormalities (e.g. Angelman and Prader-Willi syndromes). Comparative genomics will be applied to the study of heritable traits in humans. The structure, function, and evolution of the sex chromosomes will also receive special attention. Gene therapy, cloning (stem cell, germ line) and the associated ethical issues will be considered in some depth. Students who are interested in bioengineering or medical school should find this course useful as well as those who have a general interest in the human as an organism.

Academics

Academic Policies

One of Olin's highest priorities is the well being of its students, and Olin recognizes that individual circumstances often call for individual approaches. Olin's faculty, staff, and administration will always attempt to do what is right, regardless of the formal rule. The following policies will help to ensure that students are treated fairly.

Attendance Policy

Students are expected to attend all classes at Olin. Each instructor will establish and publish the class attendance policies for reporting anticipated absences and making up missed work, including lab experiences and project work. The Dean of Student Life will grant exceptions for illness, religious observance, or other reasons deemed appropriate.

Definition of Full-Time Status

Enrollment at Olin College is for full-time study in engineering. Students are expected to follow the curriculum design for each class year and carry a usual load of 16 degree credits. The definition of full-time study is a minimum of 12 attempted degree credits each semester and a maximum of 20 attempted degree credits each semester. Part-time study is generally not available at Olin College; however, special cases will be considered by the Assistant Dean of Student Life for Advising.

Course Overload Policy

Olin students may register for a maximum of 20 credits each semester. The maximum load of 20 credits is a total of degree and non-degree activities. In exceptional circumstances, students may petition the Committee on Student Academic Performance (COSAP) with the consent of their adviser for approval of a course overload. This reflects Olin's commitment to reasonable expectations. Non-degree credits result from Passionate Pursuits. First-year, first-semester students are limited to taking a maximum of 18 credits. This typically represents sixteen credits of standard first-year curriculum and an optional two credit Introductory Programming course.

Class Standing

Class standing is determined by the number of degree credits a student has earned in relation to the 120 required for graduation. The following table is a breakdown of earned degree credits and their corresponding class year and represents a reasonable expectation of progress toward a degree over four years.

Class	Earned Degree Credits
First-Year	0–30
Sophomore	31–60
Junior	61–90
Senior	> 90

Declaration of Major/Change of Major

Students are expected to declare their major no later than the time of registration for the fourth semester. Major declaration forms are available at the Student Accounts and Records Center (StAR) website (http://star.olin.edu) and must be signed by the student and his or her adviser. Students declaring the Engineering major must also complete and submit a major course planning form at the same time. The instructions and form can also be found on the StAR website.

Change of majors can be submitted using a declaration of major form and a major course planning form (if appropriate). Students that change their major should be aware of their remaining degree requirements. Additionally, they are responsible for tuition, room/board and fees for any semesters beyond the eight covered by the Olin scholarship.

Registration

Prior to each semester, there will be a designated registration period in which students will speak with their adviser and make choices for course selection. Registration is done on-line. Instructions are available each semester in the published registration booklets.

Cross-Registration Policy

Olin has cross-registration agreements with Babson College, Brandeis University, and Wellesley College (the BBW schools). These agreements increase the academic offerings available to Olin students in the natural and mathematical sciences, arts, humanities, social sciences and business. Olin students, with the exception of first-semester, first-year students, are permitted to enroll for one course each semester at each of the BBW schools, subject to the continuation of the cross-registration agreements. Taking a course at a BBW school will count toward a student's total degree credit load at Olin. Normally, Olin students are not permitted to take courses at BBW schools which would substantially duplicate the content of a course or set of courses available at Olin, but may petition the Course Substitution and Transfer Board (CSTB) for an exception to this rule. With prior approval from the CSTB, students may use courses taken at the BBW schools to satisfy general course requirements, distribution requirements, and program-specific course requirements.

Students are responsible for all deadlines and registration procedures related to the host school. Information regarding procedures for cross-registration is provided in the semesters' registration booklet. Note: Due to the variation of grading deadlines at BBW schools, seniors are strongly encouraged not to cross-register during their final semester at Olin.

The Add Period

During the first 10 instructional days of a semester, a student may alter her or his schedule by adding and/or dropping courses with approval from the appropriate instructing faculty and her or his adviser. Requests for changes must be made during the 10-day period. Students are responsible for submitting their request electronically or in person at the Student Accounts and Records Center no later than the 10th class day. Courses cannot be added after the 10th class day. Special circumstances may be granted for BBW sponsored courses when there is a variation in the academic calendars.

The Drop Period

After the Add Period, a student may decide to drop a course from his or her schedule without penalty as long as he or she maintains a minimum of 12 degree credits. The drop date is the 45th instructional day of the semester.

Course Withdrawal

Students may not withdraw from courses within the Integrated Course Blocks during their first year at Olin. Students may withdraw from other courses up through the last day of instruction in the semester, provided they remain enrolled in 12 degree credit hours. To withdraw from a course, students need written approval from the instructing faculty member and their adviser. Students must then process the course withdrawal at the Student Accounts and Records Center. A grade of Withdrawn (W) will be entered for the course and will not affect the grade point average. Credits attempted will be noted, but course credit will not be earned. Students are responsible for meeting with their adviser to determine how the credits, and/or requirement will be completed in the future.

Olin students cross-registered at one of the BBW schools must follow the academic policy on course withdrawals for the host school.

Half-Semester Courses

The Add, Drop and Course Withdrawal periods are prorated for half semester courses. The Add Period is the first five days of the semes-

ter. The Drop Period is 10 days prior to the last day of instruction. Course withdrawals can be done up through the last instructional day of the half-semester course.

Grading at Olin

Philosophy

Standards-based Grading: Course grading at Olin will be based on student progress toward defined course goals. Summary metrics (e.g., GPA) will be provided on the student's transcript, but relative summary metrics (e.g., class rank) are neither published nor tabulated. The Dean of Faculty will annually conduct a review of grade distributions and grading procedures.

Grading Rules and Regulations

1. Privacy: Olin will not publicly post either grades or summary metrics (e.g., GPAs) in any form that allows identification of any particular individual's performance. It is expected that students will respect the privacy of each other's grades.

2. Grading Clarity Requirements: On the first day of instruction, each Olin class will publish the following information:

- **a.** Learning Objectives that specify the knowledge, skills, and attitudes that students are expected to develop or attain in the class. The learning objectives should be an effective instrument for students to understand what they will learn and how their learning will be evaluated.
- **b.** Grading Criteria that specify how the final course grade is determined. Some aspects of grading are necessarily based on the professional judgment of instructors, informed by their experience, and are subjective.

3. Feedback: Olin expects instructors to provide students with feedback on their performance. If an instructor feels a student will not pass a course, or if the instructor is otherwise concerned about a student's performance, she or he will issue an academic warning notice in a timely manner. Copies of this notice will be sent to the student, the student's faculty adviser, and the Assistant Dean of Student Life for Advising.

4. End of Semester Feedback to the Adviser: Olin advisers have real-time access to advisee's course grades through the Student Information System. In addition, instructors will notify advisers of any significant concerns noted during the semester.

5. Pass/No Record First Semester: In the first-semester, first-year, Olin instructors may report the student's grade to the student and to the adviser, but will report only a grade of Pass (P) or No Record (NR) to the Registrar. A grade of No Record does not affect the student's GPA. In subsequent semesters, Olin instructors will report the student's final course grade, according to the scale outlined below, to the Registrar.

6. Course Grades: Course grades at Olin provide students, their advisers, potential employers and graduate schools information about overall performance. Course grades are determined based upon a mix of demonstrated comprehension, skill, participation, and effort.

7. Grading Scale: The Olin College grading scheme contains letter grades with a resulting grade point average (GPA) on a four-point scale. Students will be assessed using the following interpretation:

Grade	Assessment Description	Point Value
A	Excellent	4.0
A-		3.7
B+		3.3
B	Good	3.0
B-		2.7
C+		2.3
C	Fair	2.0
C-		1.7
D+		1.3
D	Poor	1.0
F	Failing	0.0
I	Incomplete (temporary grade)	n/a
IF	Incomplete Failing	0.0
IL	Incomplete / Leave of Absence (temporary grade)	n/a
IP	In Progress (temporary grade)	
L/NR	Leave/No Record	n/a
NC	No Credit for Pass/No Credit Option	n/a
NR	No Record	n/a
P	Pass	n/a
R	Course Repeated	n/a
TR	Transfer Credit	n/a
W	Withdrew from Course	n/a

8. Grade Replacement: If a student successfully achieves remediation of an eligible course (see Remediation in the ICBs), the course grade will be changed. The grade given as a result of remediation activities may be a Pass (P) for a first-year, first-semester course remediation or no higher than a C for other course remediation.

9. Repeated Courses: If a student retakes a course, the original attempted course will show a grade of Course Repeated (R). The new grade or transfer credit will appear on the transcript in the semester in which the course was retaken. The original grade will remain, but will not be factored into the student's GPA.

10. Minimally Sufficient Grades: A grade of D or Pass is sufficient to earn credit for a course. A grade of D is sufficient to satisfy a course requirement.

A grade of C- or Pass is sufficient to satisfy a prerequisite requirement.

11. Pass/No Credit: Up to 12 credits of a student's distribution requirements may be satisfied by taking classes that are usually offered for grades as Pass/No Credit. In such cases, a Pass is given for performance equivalent to a grade of C- or higher. Courses taken Pass/No Credit may not be used to meet course requirements unless the course is not offered for grades (e.g. first-semester first-year P/NR courses).

Courses that are only offered Pass/No Credit, Independent Study and Research do not count toward the 12 credit limit. Students must declare their Pass/No Credit grading option by the drop date of each semester. The Pass/No Credit option does not impact the GPA; either Pass or No Credit will appear on the transcript. Once a student decides to take a course Pass/No Credit, he or she cannot revert back to receive a letter grade.

12. Passionate Pursuits (including Research as Passionate Pursuit): Passionate Pursuits are non-degree credit, and will be listed on the transcript if the nature of the activity and the level of completion are sufficient to merit credit. In exceptional cases, the faculty supervisor may include an official letter of commendation in the student's file. This commendation letter will be available to external parties.

13. The Olin Transcript: A student's academic transcript at Olin includes the following information:

a. A list of classes the student took in each semester, and a record of the student's final grades in those classes. First-semester first-year transcripts will show only classes that were passed. Classes taken Pass/No Credit after the first year appear either as a Pass or as a No Credit.

b. The student's GPA.

c. A list of non-degree activities taken each semester with a cumulative total of

credits earned. There are no grades associated with non-degree activities.

d. Co-Curricular offerings in which the sponsoring staff or faculty member reported sufficient student participation for a transcript notation.

14. Grading and Credits of Cross-registered Courses: Olin students who take a course at Babson, Brandeis, or Wellesley (the BBW schools) will receive credit for the course if they receive a passing grade. The grade will be recorded on their transcript and be factored into their grade point average. Credits from these schools will be counted on a one for one basis at Olin. For example, if a three credit course is taken at Babson, it will count as three Olin credits. A one unit Brandeis or Wellesley course is equal to four Olin credits. Courses that use other accounting schemes may be translated into equivalent Olin credits rounded to the closest integer.

Honor Code

It is expected that students will behave with integrity and according to the Honor Code.

Incomplete Policy

In extenuating circumstances, a student may request an Incomplete (I) grade by petitioning the Dean of Student Life. If an Incomplete grade is approved, the student will be granted an extension period to complete the coursework. The period of the extension will be determined by the Dean of Student Life but will not be greater than the end of the subsequent semester. A grade of I will be listed as a temporary grade and will not affect the grade point average. If the work is not completed by the end of the subsequent semester, the incomplete grade of I will be changed to IF, Incomplete Failing, or an alternate grade upon approval of the instructor and the Dean of Faculty. An IF grade does affect a grade point average. Incompletes may not be used for remediation purposes.

An Incomplete is generally approved only when some specific event or illness prevents the student from completing a specific part of the course (such as completing a paper, project or exam.) An Incomplete will not be approved in instances where a student is demonstrating an overall difficulty covering or understanding the course materials and appears to need more time or additional instruction to learn the material. If such general difficulty occurs in one of the first-year ICB courses, the student should attempt to complete the course. If the student receives a NR in the first semester or a D+ or below in subsequent semesters, he or she will proceed according to the remediation policy (see below). For all other courses, the student should discuss available options with his or her course instructor and adviser.

Extra Help

For all courses, faculty members provide extra help for students as appropriate. In addition, individual tutors are assigned by the Office of Student Life. Students who feel that individual tutoring would be helpful to them should contact the Assistant Dean of Student Life for Advising as early in the semester as the need becomes apparent.

All grade changes must be made in writing and signed by the Dean of Faculty.

Remediation in the ICBs

For Integrated Course Block (ICB) courses in the first year, Olin provides a remediation system. The objective of remediation is to allow students to keep pace academically with their peers in the first year.

As the need becomes apparent, ICB faculty members work with students to develop a remediation policy specific to the courses they are teaching. At the discretion of the faculty member, students may be allowed to retake a test, rewrite a paper, or redo other projects or assignments. Students may get remedial assistance from faculty, peer tutors or individual tutors.

The ICB is a graduation requirement so a grade

of NR or F must be remediated. In addition, the ICB courses are prerequisities for many other courses at Olin, so a grade of D or D+ must be remediated, although a student may be allowed to go on while remediation is pending.

There are three ways a student can remediate:

Remediation exam: A student may study independently and pass a written or oral remediation exam. The student may attempt this exam only once, either at the beginning or the end of the semester following the original course period. The remediation exam will be prepared and evaluated by the original faculty member who taught the student's Physics, Math or Engineering component of the ICB. Assistance in preparing for the exam is available from designated peer tutors for Physics, Math and Engineering.

Remediation at another institution: With prior approval of the Course Substitution and Transfer Board (CSTB), students may remediate by taking a class at another institution (but not at one of the BBW schools). The CSTB will work with the Committee on Student Academic Performance (COSAP) to determine the grade required for remediation at another institution.

Retake the course: If a student does not successfully remediate the course before it is next offered, the student will be required to retake and pass the failed component(s) of the ICB at its subsequent offering.

Students successfully remediating through one of these three options will have their original grade replaced on their transcript. For letter graded courses, the remediated grade can be no higher than a C.

Grade Change Policy

Dispute of a Grade

Students wishing to dispute a grade should first have a discussion with the instructing faculty member. If the student and faculty are in disagreement after the discussion, the student may appeal to the Dean of Faculty. The Dean of Faculty will meet with the student within 14 days of the appeal and will solicit a statement from the faculty member. Following this process, the Dean of Faculty will review the case and submit a recommendation to the faculty member. The faculty member will then make a final decision, in consultation with the Dean of Faculty.

After one calendar year (from the end of the original grading period), all grades are final. This applies to clerical errors, grade disputes, remediation, and the grade replacement policy.

All grade changes must be made in writing and signed by the Dean of Faculty.

Final Exam Policy for Excused Absences

Students who are unable to take their final exams for legitimate reasons and wish to request a make-up exam generally must obtain advance authorization from the instructing faculty members and the Office of Student Life. In the event that advanced authorization cannot be obtained due to extenuating circumstances, students should contact the Office of Student Life and the instructor(s) as soon as they are able. If the exam is not completed prior to the end of the grading period, a grade of Incomplete, I, will be recorded on the student record. An incomplete grade is a temporary grade that does not affect a grade point average.

Academic Recommendation Board

The Academic Recommendation Board (ARB) has the responsibility to foster change and act as a steward of the curriculum. The ARB regularly reviews the curricular structure and course options and reviews and authorizes changes in degree requirements. Students may petition ARB if they need to apply for an exception to graduation requirements.

Course Substitution and Transfer Board

The Course Substitution and Transfer Board (CSTB) is a subcommittee of the ARB and has the responsibility of awarding Olin credit for classes taken at another institution. There are three cases where a student can take a class at another institution and get credit toward an Olin degree: cross-registration at Babson, Brandeis or Wellesley, classes taken during a Study Away experience, and classes taken at another institution during the summer, during a leave from Olin, or before enrolling at Olin. The CSTB also determines what distribution and course requirements a non-Olin course can count for. Many courses at the BBW schools have been pre-approved; a list of these courses is posted on the ARB website (http://arb.olin.edu). Prior to taking a non-Olin class not on the pre-approval list, students should request permission from the CSTB to count this class toward satisfying a distribution or course requirement.

Committee on Student Academic Performance

The Committee on Student Academic Performance is charged by the Dean of Student Life and is empowered to review, interpret, and propose academic performance policies. This committee considers petitions to waive existing academic performance regulations and acts as an appellate body for students with academic performance grievances. The committee also examines the records of students who are not making satisfactory progress toward a degree.

This committee is chaired by the Dean of Student Life or the Dean's designee (non-voting, except in the case of a tie) and consists of the Registrar (non-voting), the Assistant Dean of Student Life for Advising, and three faculty members. Students wishing to appeal a decision on policy must submit their appeal to the Registrar within one week of the original decision.

Students should petition COSAP if they want to exceed the approved maximum credits in any given semester.

Student Academic Performance

The Committee on Student Academic Performance uses the following guidelines in determining the academic status of students. Students not in Good Academic Standing will be placed on probation. Students not in Good Academic Standing for two consecutive semesters will be reviewed by the committee and may be required to withdraw. The committee may consider extenuating circumstances in applying these general guidelines.

Qualitative Measure of Academic Performance:

Student's First Semester: Good Academic Standing is defined as receiving Pass grades in all courses by the start of the second semester.

Subsequent Semesters: Good Academic Standing is defined as having a minimum cumulative grade point average of 2.00 by the end of the semester.

Quantitative Measure of Academic Performance:

In order to complete the degree in four years (eight semesters), each student will normally take 16 credits (four courses) per semester. Olin College expects students to make reasonable progress toward their degree each semester. As a result, to remain in good standing a student must complete a minimum of 12 degree credits each semester. The Committee on Student Academic Performance will review this quantitative measure in addition to the qualitative measure of a minimum grade point average.

Academic Readmission

In making decisions on readmission petitions, the Committee on Student Academic Performance (COSAP) will expect the former student to produce timely evidence of good academic performance in college courses comparable to Olin courses, employment and/or community service references, and a formal statement explaining changes that will contribute to their academic success at Olin. Credit for courses taken elsewhere while a student is withdrawn from Olin will be transferable to Olin only if approval is obtained from the CSTB prior to enrollment in each course.

Program Group Recommendations

The Program Groups (ECE, ME, E) will periodically review the progress of every student with a declared major. The program groups will work with students and their faculty adviser if performance in program-specific course requirements is unsatisfactory or if trends indicate that such performance may become unsatisfactory.

College Withdrawal Policy

Students may wish to leave Olin College prior to completing their degree. Such a decision may be difficult to make. Therefore, we encourage students to discuss the situation with their faculty adviser and the Assistant Dean of Student Life for Advising. A student should consider whether a Leave of Absence might provide a more suitable means for them to address the underlying circumstances for the withdrawal. The student's decision to withdraw indicates she or he does not intend to return. If a student needs a leave of absence, she or he should follow the procedures described below for requesting a leave. Dropping all registered courses does not automatically result in an official withdrawal from the college.

Voluntary Withdrawal

A student can voluntarily withdraw from Olin College. The student must file a College Withdrawal Form with the Assistant Dean of Student Life for Advising. Withdrawing for non-medical reasons during a semester will yield grades of W, Withdrew, on the student's academic record. If Voluntary Withdrawal occurs after the last instructional day of the semester, grades from that semester will appear on the transcript.

Medical Withdrawal

Students who need to withdraw from Olin College for medical reasons should complete a College Withdrawal Form with the Assistant Dean of Student Life for Advising. If a student intends to return to the College, he or she should follow the procedure outlined in the Leave of Absence policy. Medical Withdrawals during a semester (i.e., by the last instructional day of a semester) will result in deletion of the semester's registration from the student's record. Students may be entitled in these circumstances to a full or partial refund of certain expenses and fees according to the guidelines of the College's refund policy. Medical documentation may be required to complete the process.

Required Withdrawal

At times, the college may require a student to withdraw from Olin College for academic or other reasons. Students who are required to withdraw may not reenroll at Olin without approval from the Office of Student Life.

Leave of Absence Policy

A student may request a leave of absence for up to 180 days in any 12-month period.

To initiate a leave of absence, a student should meet with his or her adviser and complete a Leave of Absence Form. The request is then forwarded to the Assistant Dean of Student Life for Advising for approval. Documentation of the reason for the leave of absence (medical or otherwise) should accompany the student's request for a leave. The request, when approved, and any accompanying documentation will be forwarded to the Registrar for processing and placed in the student's academic file.

In the event a Leave of Absence is approved, the student's status will be noted as "On Leave." If a leave is not approved, students have the right to appeal the decision to the Dean of Student Life within two weeks of the date of the denial of leave. There are two kinds of leaves:

1. A Leave of Absence Mid Semester: This type of leave is requested when a semester is in active session*. In this case, all courses for which the student is registered will be temporarily designated as Incomplete/Leave of

** This active session does not include the study or final exam period. If a student has an unexpected event that impacts his or her ability to take a final exam, he or she should refer to the Final Exam Policy for Excused Absences.*

Absence (IL). Any course that is not subsequently completed will then be changed to a grade of Leave/No Record (L/NR) and will be recorded internally for that course. Incomplete/Leave of Absence and Leave/No Record grades do not affect the student's grade point average. The effective date of this leave is the approval date of the leave.

Incomplete/Leave of Absence grades must be completed no later than 90 days after the student's return date, or at another date determined by the faculty member and adviser.

2. A Leave of Absence Between Semesters: This type of leave is requested when a semester is not in active session and there is a circumstance that impacts the student's ability to continue in the next semester. In this type of leave, there are no grade entries made. The student's schedule for the ensuing semester will be deleted. The student will be placed on leave effective the first day of the upcoming semester for up to 180 days in any 12-month period.

If a student does not return from a leave of absence, the student will be withdrawn from the college as of the date of expected return. All Incomplete/Leave of Absence grades will be changed to Leave/No Record.

Return from Leave or Withdrawal

Students wishing to return from a leave of absence or voluntary withdrawal, leave of absence or medical leave from the college should contact the Office of Student Life.

Study Away Program

One of the founding principles of Olin College was that each student should have the opportunity to have a learning experience "away" from the College. This ideal was articulated early in the creation of the college with the expressed objective of having students learn to be citizens of the world. The Olin Away Program was created to deliver on this principle, and provide students with the opportunity to broaden their perspective and views of the world.

Students in their junior year can choose between three types of away experiences: a Direct Exchange Program, a Pre-Approved Program, or a Student-Designed Program.

For additional information please refer to: *http://awayprograms.olin.edu*

Transfer Credit

Olin College generally does not accept transfer credit for incoming students, but the Course Substitution Transfer Board (CSTB) may grant exceptions on a case by case basis for incoming students who have demonstrated strong performance in rigorous courses taken at accredited institutions.

Enrolled students wishing to take a course at another college and transfer the credits to Olin must obtain prior approval from the CSTB. A student will need to provide detailed information about the course including, but not limited to, a course description and syllabus. Pre-approval forms can be found at: http://star.olin.edu

The CSTB will ask appropriate faculty to review the course materials before granting approval and determine the minimum grade standard for transfer of the specific course. If approved, the CSTB will notify the student in writing. Once the course is completed, it is the student's responsibility to have an official transcript sent to Olin College. Provided the student meets the minimum grade requirement for transfer, the course and the credits will appear on the student's Olin transcript. The grade does not transfer. The Olin College curriculum is for eight full semesters. Transfer credit does not imply that a student is able to finish his or her degree in less than eight semesters.

In order to receive a degree from Olin, students must earn at least 60 of their credits from Olin or BBW courses.

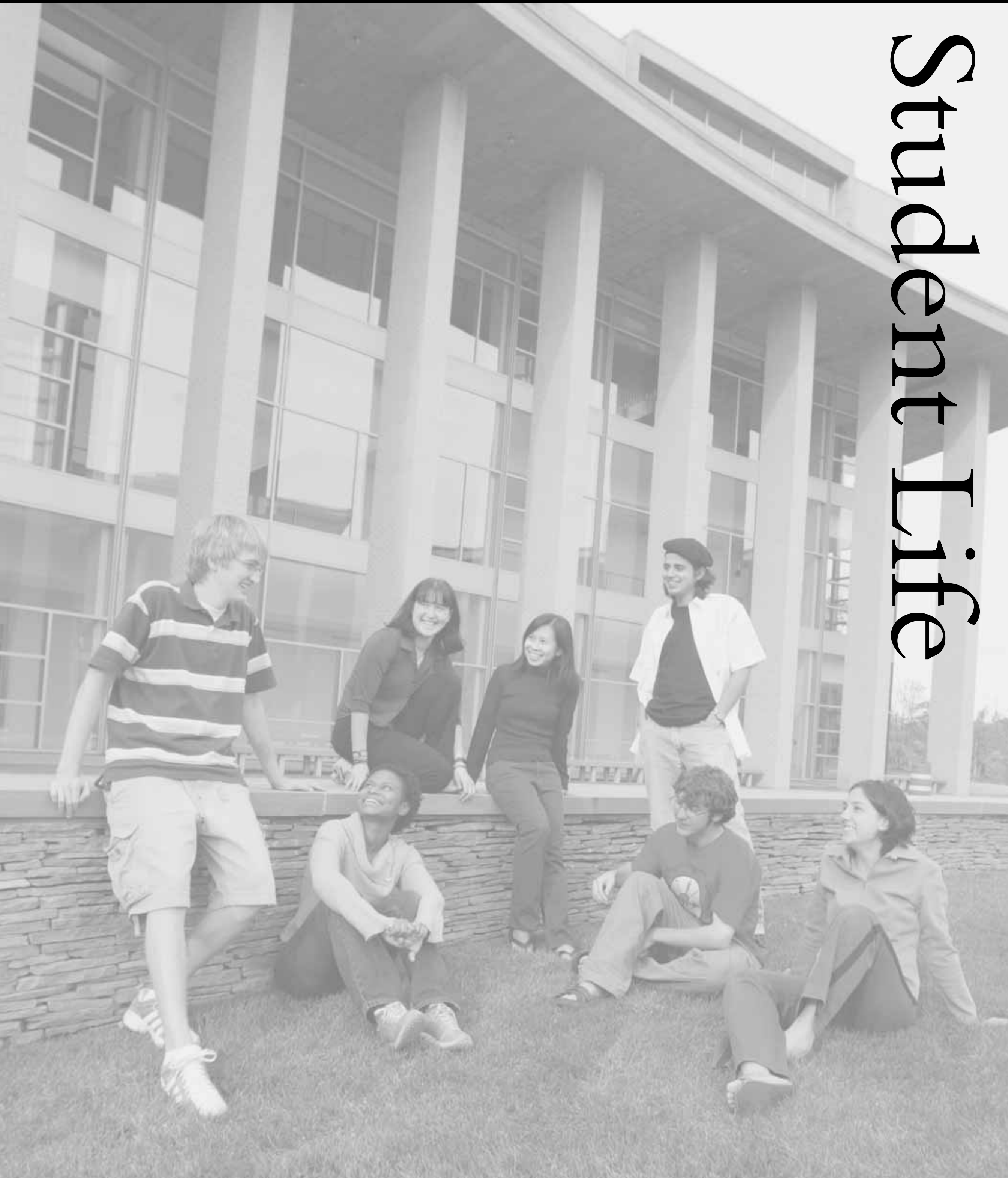
AP Exams and Advanced Study

Olin College does not accept AP Exam credit for incoming students. Olin College does, however, recognize that many students enter Olin with a strong background in mathematics and physics. First-year students may take a placement exam in the subjects of the first-year mathematics or physics courses during orientation. Placement exams at Olin are calibrated to a high standard.

Special Accommodations Policy

It is Olin College's policy to comply fully with all state and federal disability laws. Olin does not discriminate against applicants or students with disabilities, and will consider modification to academic programs where necessary to ensure that our requirements are not discriminatory, as long as the modifications do not fundamentally alter the nature of our programs. The Office of Student Life coordinates services for students with learning disabilities, sensory impairments, psychological disabilities, and medical conditions. Students are responsible for identifying themselves to the Assistant Dean of Student Life for Advising and providing appropriate documentation of their disability and need for accommodation in a timely manner. Students requesting accommodation should contact the Assistant Dean of Student Life for Advising as soon as possible after matriculation. Services for students with learning disabilities may include, but are not limited to, academic accommodations, coaching on organizational and time management skills, faculty notification, and academic advising. Services for students with physical, sensory, or psychological impairments as well as medical conditions may include, but are not limited to, academic accommodations, assistance with adaptive technology, accessibility accommodations, and academic advising. Any specific modifications granted will be based on detailed discussions with each student about their particular situation, and on information from a medical care provider concerning the student's disability and related needs.

Student Life



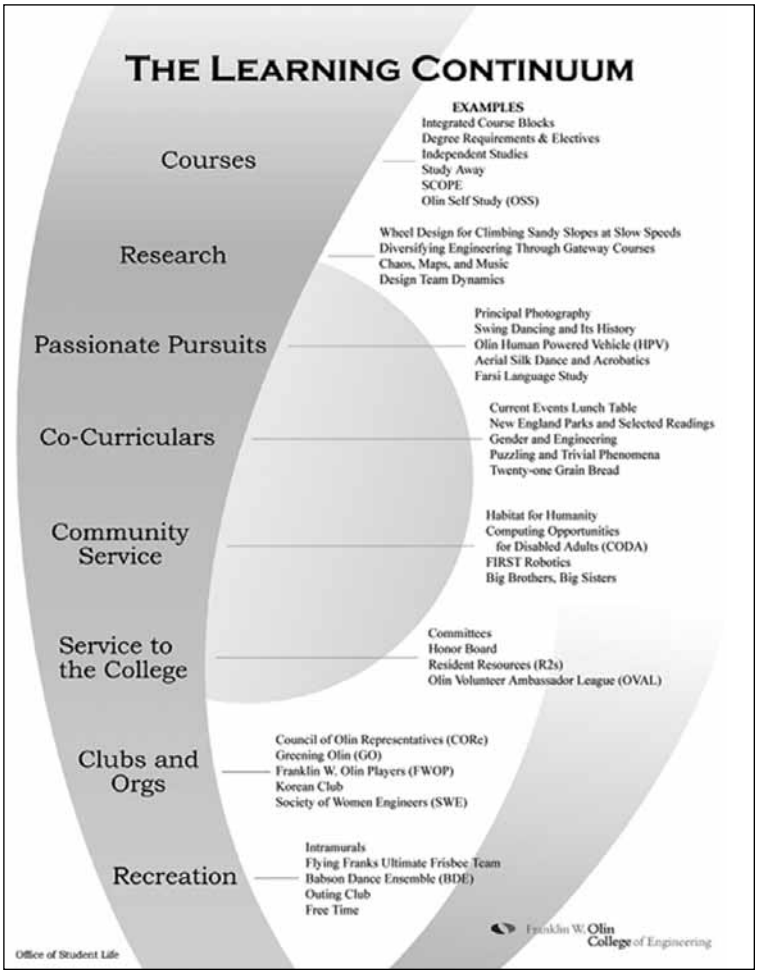
Student Life

Overview

The first few classes at Olin College have the rare ability to help create the campus culture. Each student has the chance to make a real impact on the direction of programs, available opportunities and the overall atmosphere of the new college.

While still new, Olin already offers the support, flexibility and services students need for a successful, well-rounded college career — from a wide-range of clubs and activities to academic advising and health services.

The Office of Student Life also takes student development one step further with the Olin College Learning Continuum. While nearly every college in America offers academic courses and student organizations, seldom is much thought given to the unstructured zone between the curriculum and extra-curriculum, or the connections between them. At Olin, we have given this zone a lot of thought.



The Olin College Learning Continuum consists of courses, undergraduate research opportunities with faculty, non-degree credit Passionate Pursuits, transcript noted co-curricular offerings, community service, committee work or other service to the college, clubs and organizations, and recreation. The Office of Student Life staff encourages student participation along the full range of opportunities in the Learning Continuum and works to foster connections among the elements on the continuum.

Honor Code

A fundamental element of Olin's culture is trust. As such, our Honor Code requires all members of the Olin community to conduct themselves with honor and integrity. The code, drawn from a few core values, consists of a small set of intentionally broad standards by which every action must be measured. While a small number of policies illuminate Olin's principles, students live by the core values embedded in the code. To read the full code, visit the student life page of the Olin website, http://www.olin.edu/student_life/.

Passionate Pursuits

A Passionate Pursuit is an activity in which students propose a semester-long project, solicit faculty participation, and establish objectives (i.e. learning goals, type of deliverable) that constitute satisfactory completion of the pursuit. In order to earn non-degree credit for a Passionate Pursuit, students must submit a credit proposal and give a faculty-assessed presentation or performance at the conclusion of the activity. Funding is available via the Office of Student Life.

Co-Curriculars

Co-curricular offerings are non-credit activities combining fun and intellectual awareness. They are scheduled for a limited time (e.g. one semester), are led by a staff or faculty member or by a student working in concert with a faculty or staff member, and are funded by the Office of Student Life. They differ from curricular offerings in that they are not graded and attendance is not strictly enforced. They differ from extra-curricular activities in that they have an intellectual component, faculty/staff leadership, and limited lifespan. Examples of recent co-curricular offerings include: Twenty-one Grain Bread, Choral Music, Current Events Table, Ornithology for Engineers, and The Practice and Politics of Needlework.

Academic Advising

Coursework and advising are different aspects of the same process — developing a well-educated person. Olin College views advising as a central role of our faculty. Students' relationships with their advisers are among the most important ones they will establish here and can have a significant impact on their Olin education. The advising system includes individual advising, advising families, extended advising families, the Sibbs program, and Annual Reports and CVs.

Individual Advising

Every student has an Olin faculty member as an adviser. Every adviser's goal is to facilitate students' academic and personal development throughout their education at Olin. Although they help students with courses and other academic choices, their most vital responsibility is to help advisees manage the difficulties and stresses inherent in any academic setting. Students meet with their advisers regularly all four years, at a rate determined by the student and the adviser.

Advisers are not around just to approve courses or discuss academics. They serve a variety of functions including mentoring, crisis awareness and support, discussing Annual Reports and CVs, providing institutional and career information, and helping students find a balance among curricular, co-curricular and extracurricular activities. Students should view advisers as helpful resources for whatever issues they are dealing with — academic, social or personal. When advisers do not have the needed information or expertise, they help find someone who does.

Students may remain with one adviser throughout or change advisers at the formal "adviser request period" at the end of each year. A student wishing to switch advisers at other times may discuss this with Assistant Dean of Student Life Alison Black. Olin wants advising to be successful and will do whatever we can to make this relationship supportive, positive and effective.

Advising Families

Individual advising relationships are set within advising families consisting of all a faculty member's advisees, and extended families consisting of three faculty members and their advisees. Students will often meet individually or in advising families with their primary adviser. Other times they will meet with some or all of the other advisers and students in their extended families. Families and extended families vary in their activities, but all provide a structure for incoming students to meet upperclassmen, allow for cross class meetings and discussions, give students multiple faculty perspectives, and plan periodic social activities. Students are strongly encouraged to take part in initiating and organizing family and extended family activities; funds are available from the Office of Student Life.

Sibbs Program

The Sibbs program builds bridges (hence the double "b") between first-year and upper class students. Volunteer upper class Sibbs (often from the same advising family) "adopt" a first-year to help him or her adjust to the unique culture, quirks and inside information of Olin. They contact their incoming Sibb over the summer to answer questions before arrival. Early in the year, Sibb pairs get together for a meal at least weekly. Upper class Sibbs also introduce their first-year Sibbs to people and places in the area by inviting them to do several activities during the fall. The most important role, however, is to talk with, answer questions from, give information to, and generally be available to the incoming student. If either member of the Sibb pair feels that the relationship is not working well, they should discuss this with each other or contact Assistant Dean of Student Life Alison Black.

Annual Reports and CVs

Throughout their time at Olin, students will write and revise Annual Reports and CVs and submit them periodically to their advisers. The purpose of writing these documents and discussing them with advisers is to help students choose wisely from the myriad of curricular, co-curricular and extracurricular options available and make adjustments to get the most out of their Olin experience. The CV is a listing of the activities across the Learning Continuum the student has participated in each semester. CVs provide a helpful background for meeting with advisers to plan for the future as well as for writing resumes for job or internship applications. In the Annual Report, students reflect on the challenges and successes of the year and set goals for the future.

Some advisers will meet with students individually to discuss Annual Reports and CVs. Others may do this as part of a mini-family or family meeting. However this is done, students are encouraged to keep these up to date and submit them to their adviser regularly. Certain activities, such as registering for courses or passionate pursuits, are impacted by having Annual Reports and CVs up to date. Students who change advisers must submit recent copies of these documents to their new adviser by their first meeting.

Community Service

Mission

One of the guiding missions of Olin College is to instill a spirit and practice of "giving back" among students through significant and ongoing service to the community. Philanthropy was the central force in the F. W. Olin Foundation and Olin College since its inception and Olin College is committed to supporting and continuing this tradition among its students, faculty and staff. Olin College encourages community service by providing financial support through the Office of Student Life and reserving time dedicated to community service weekly in the schedule. To learn more about community service at Olin and how you can be involved, read on! More information is available on the website at http://serv.olin.edu

Structure

The Organization to Support, Encourage, and Recognize Volunteerism (SERV) helps students, faculty and staff get involved with a variety of community service activities at Olin. SERV consists largely of individual community service projects which involve groups of students, faculty and staff who meet regularly to do community service. Any member of the Olin community may start a project. Each project selects its own leader who is responsible for all aspects of the project including getting volunteers, determining budget needs, coordinating with the appropriate outside organizations and making necessary practical arrangements. SERV is available throughout to provide advice and support.

Project leaders attend periodic meetings of the Association of Project Leaders (APL). At APL meetings, project leaders report on individual projects and discuss common issues and concerns across projects. They consider ways to coordinate projects and generally support and improve the functioning of community service at Olin.

SERV is governed by seven elected student officers and three faculty/staff advisers who foster community awareness, increase involvement in community service activities and generally work to support and coordinate community service activities at Olin. They coordinate with outside groups seeking volunteers, plan one-time and whole community events, maintain the website (http://serv.olin.edu), charter projects, make budgeting decisions and generally deal with community service concerns that arise throughout the year.

For more detailed information about the policies and services discussed here and offered by the Office of Student Life, please refer to the Student Handbook.

Admission, Expenses and Need-Based Aid

Applying to Olin

Olin College will enroll approximately 75 students who rank among the top in the country for the Class of 2011. By traditional measures (course rigor, test results and achievement) the quality of students we seek will be outstanding; however, we place equal importance on personal character, creativity, risk-taking, unusual life experiences and an entrepreneurial spirit. Specifically, we are looking for:

- Exceptional academic ability and performance, especially in math and science;
- Strong written and oral communication skills;
- Excellence in co-curricular and extracurricular activities;
- Evidence of leadership and collaboration;
- Understanding of Olin College's mission;
- Adventurous and entrepreneurial spirit;
- Energy, commitment to high standards, perseverance and a sense of humor.

Olin College strives for gender balance and a student body that is multidimensional, representing a broad range of cultural, economic and geographic backgrounds. Olin College is now approved by the INS to issue I-20 forms (student visas) and seeks a multicultural presence on campus by enrolling international students and those with significant international experience. US Permanent Residents and Greencard holders are also eligible for admission.

The Olin Application

The Olin College admission application is available online. A .pdf version of the application, printable from the Admission web site, is also available, but candidates are strongly encouraged to apply online. There is no Early Action or Early Decision at Olin College.

Admission Process

The application for admission consists of seven parts.

1. Basic biographical information
2. Application fee ($60 U.S./$80 International) and signed Affidavit
3. Secondary school report (returned by your counselor with official transcripts)
4. Two teacher recommendations — one from a math or science teacher and one from a teacher of your choice
5. Results of the SAT or ACT with the optional Writing Test, plus two SAT Subject Tests (Math Level 1 or 2 and a science exam of your choice). Our CEEB code is 2824; the ACT code is 1883.
6. Two essays — one 500 words and the other 300 words
7. Personal résumé of activities, honors, awards, employment, etc.

After applications have been reviewed, approximately 170 top applicants will be selected to attend one of our two "Candidates' Weekends" in late February and early March. During these weekends candidates will participate in group design exercises, interviews and informal discussions with Olin faculty and students. From this group of candidates we will select the incoming class.

Application Timetable 2006–07

December 2006
All standardized testing must be completed

January 1, 2007
Deadline for submitting application and supporting materials

February 5, 2007
Applicants notified if they have achieved "Candidate" status

February 23-24, 2007
Candidates' Weekend #1

March 2-3, 2007
Candidates' Weekend #2

Late March 2007
Notification letters are mailed

May 1, 2007
National Candidates' Reply Date

Admission Visits and Tours

Tours and information sessions are available by appointment only. Please email visit@olin.edu or call the Office of Admission at (781) 292-2222 to make a reservation.

Day and Overnight Visits

Day visits allow prospective students to attend a class, meet current students and faculty, and enjoy a meal in our Dining Hall. Class visits are scheduled by appointment on Mondays through Thursdays from early-to-mid fall.

Overnight visits for high school seniors can be scheduled on Sunday through Thursday nights from early-to-mid fall. Space is limited, so please contact the Office of Admission well in advance to schedule your stay. In the spring, overnight visits are limited to admitted students.

Office of Admission Hours

Monday through Friday: 9:00 a.m.–5:00 p.m.

Selected Saturdays in the fall: 9:00 a.m.–12:00 p.m.

Please see the *Directions/Visiting* page on our website (www.olin.edu) for information about transportation, lodging and dining in the area.

Costs and Aid

Scholarship Policy

Olin's generous scholarship policy stems from one of the founding principles of the college — to provide a world-class engineering education at significantly reduced cost to students and their families. All admitted students who enroll at Olin College receive an Olin Scholarship covering tuition during the four years of the baccalaureate program. This scholarship is currently valued at approximately $130,000.

Estimated Cost: Academic Year 2006–07

Below are estimated costs for the upcoming academic year. We expect nominal increases in these figures for subsequent years.

Billed Expenses

Tuition	$32,100	(covered by scholarship)
Room	$7,500	
Meal Plan *(students choose plan)*	$4,100 $3,750	(Blue Plan) (Silver Plan)
Laptop Purchase	$1,250	(estimate on 1st two of four payments)
Health Insurance	$682	(if needed)
Student Activity Fee	$150	

Unbilled Expenses

Books & Supplies	$750	(estimate)
Travel & Incidentals	$1,500	(estimate)
Total Student Budget	**$48,032**	(with Blue Meal Plan)
Olin Tuition Scholarship	– 32,100	
Balance	**$15,932**	

Need-Based Assistance

Families interested in applying for additional assistance to meet costs in excess of the Olin College Scholarship should submit a copy of the FAFSA (Free Application for Federal Student Aid) **online**. Olin's institutional code is **039463**. For more information go to http://www.fafsa.ed.gov/index.htm. All students must submit the online FAFSA **no later than May 1** in order to be considered for need-based assistance

Note: Students applying for need-based financial aid are expected to provide $3,500 in self-help — $2,000 from summer savings and $1,500 from on-campus employment. Students applying for need-based aid who receive outside scholarships must report this information to Patricia Blanchette, Assistant Director of Admission and Financial Aid, at 781-292-2212. Please see the section below for more information about outside scholarships.

An Example of Need-Based Aid

Cost of Attendance	$48,032
Olin Scholarship	–32,100
Net Cost	$15,932
Summer Earnings	–2,000
Campus Employment	–1,500
Balance	$12,432

Minus family contribution = Unmet need

Eligibility for need-based aid is determined by federal methodology, which calculates a family's ability to contribute. If the Expected Family Contribution is less than $12,432, the student is eligible for need-based aid from Olin College and may also be eligible to receive federal funds as part of his or her total financial aid package. Students and their families may also elect to apply for educational loans to help cover a portion or all of the Expected Family Contribution. Families who are interested in pursuing loans and/or a monthly tuition management program are encouraged to contact Sean Porter at MEFA, the Massachusetts Educational Financing Authority, at 617-244-4805.

Outside Scholarship Policy

All students are expected to pursue outside merit scholarships (local, regional, and national). These scholarships bring distinction to the student and to Olin. If the scholarship is non-restricted, the funds can be applied to billed expenses including room, meal plan, required laptop purchase and other educational expenses. If the scholarship is restricted to tuition only, it reduces the amount of the Olin Scholarship accordingly. The total of all scholarships, grants, and self-help cannot exceed the total Olin College student budget. Please note that outside scholarships **may** affect the amount of need-based assistance a student is eligible to receive from Olin College

Note: National Merit and National Achievement Scholarships cannot be used at Olin until the college receives regional accreditation, even though a high percentage of Olin students are designated as Finalists or Scholars.

Olin Scholarship Policy

The Olin College tuition scholarship is for eight consecutive semesters of full-time study. Anyone permanently disqualified to attend or return to Olin College for academic or disciplinary reasons will forfeit the remaining portion of the scholarship. Study away (which requires pre-approval) or an internship for credit counts as one of the eight scholarship semesters; the student is expected to pay for costs associated with any such activity, including host institution tuition and fees (if required). For mid-semester leaves of absence, the partial semester counts as one of the eight scholarship semesters; payment of tuition is required for any semester(s) beyond eight before graduation. For end-of-semester leaves of absence, the semester on leave does not count as one of the eight scholarship semesters (unless the student requests transfer credit for this semester). Olin College provides accommodations for documented disabilities. In extenuating circumstances, exceptions may be granted by the Provost.

Faculty, Instructors, and Consultants

Faculty Profiles

Sarah Spence Adams, Ph.D.
Assistant Professor of Mathematics

Dr. Adams maintains an active research program that focuses on increasing the reliability and efficiency of wireless communications. She earned her Ph.D. and M.S. in mathematics at Cornell University, where she was also a member of the Wireless Intelligent Systems Laboratory in the Department of Electrical and Computer Engineering. She holds a B.S. (summa cum laude) in mathematics from the University of Richmond. Dr. Adams has conducted research at the National Security Agency (NSA), the Institute for Defense Analyses, Center for Communications Research, and the NATO Advanced Study Institute. Recently, she wrote a book on algebraic coding theory that is used to introduce applications to abstract algebra classes. She is an ExxonMobil Fellow in the Mathematical Association of America's (MAA) Project NExT and serves on MAA national committees involving undergraduate programs/research. She recently received an NSA Young Investigator's Award to support her research in space-time coding and an NSF grant to develop a new, multi-faceted coding theory and cryptology course.

David Barrett, Ph.D.
Associate Professor of Mechanical Engineering and Design and Director of SCOPE

Prior to joining the Olin faculty, Dr. Barrett was vice president of engineering at iRobot Corporation, where he was responsible for identifying new business opportunities, establishing strategic partnerships, directing project teams and developing a wide range of robotic systems. Before iRobot, Dr. Barrett founded and directed a division of the Walt Disney Imagineering Corporation. In addition to his many published articles, Dr. Barrett holds eight patents with previous colleagues on a variety of robotic systems. He is a member of numerous professional societies including IEEE Robotics and Automation, Vehicular Technology, and Ocean Engineering Societies. Dr. Barrett received his Ph.D. and M.S. in ocean engineering and M.S. in mechanical engineering, all from MIT and a B.S. in mechanical engineering (summa cum laude) from the University of Lowell.

Brian Bingham, Ph.D.
Assistant Professor of Mechanical Engineering

Dr. Bingham joined the Olin College faculty after completing his postdoctoral investigation in the Deep Submergence Laboratory at Woods Hole Oceanographic Institution. At the Deep Submergence Laboratory, Dr. Bingham investigated autonomous underwater navigation and manipulation while supporting at-sea operations and remotely operated vehicles. In addition to being a member of the IEEE and the Marine Technology Society, Dr. Bingham has authored several conference publications and spoken at many seminars and colloquia. He earned his Ph. D. and M.S. from MIT in mechanical engineering and a B.S. from the University of Missouri-Rolla. Dr. Bingham's research focus is autonomous field robotics.

John R. Bourne, Ph.D.
Professor of Electrical and Computer Engineering, Professor of Technology Entrepreneurship (Babson College) and Director of the Sloan Center for Online Education at Olin and Babson Colleges

An expert in online learning, Dr. Bourne joined Olin from Vanderbilt University in 2000, where he was professor of electrical and computer engineering and professor of biomedical engineering. At Vanderbilt he pioneered an innovative learning methodology, the asynchronous learning network (ALN). He headed Vanderbilt's Center for Innovation in Engineering Education and the ALN Center. He established the ALN Web in 1996 and launched the Sloan Consortium, a group of over 1000 institutions supported by the Alfred P. Sloan Foundation. He currently serves as Executive Director of the Sloan Consortium. Dr. Bourne recently received the Education Activities Board Meritorious

Achievement Award in Continuing Education from the IEEE. He received the Sloan Consortium 2001 Award for "Most Outstanding Achievement in ALN by an individual." Dr. Bourne received his Ph.D. in electrical engineering from the University of Florida. He is a fellow of the IEEE and the American Institute of Medical and Biological Engineers. He is founder and editor-in-chief of the *Journal of Asynchronous Learning Networks* and editor-in-chief of the *Critical Reviews in Biomedical Engineering*.

Debbie Chachra, Ph.D.
Assistant Professor of Materials Science

Dr. Chachra's current research focuses on bone tissue, including studying how bone cells interact mechanically with their underlying substrate — for example, why your bones get stronger if you exercise, or how bone cells at a fracture site "know" that the bone is in a cast. In addition, her research group also investigates the effect of therapies for osteoporosis on the mineralization and the mechanical properties of bone. Prior to joining the faculty of Olin College, Dr. Chachra was a postdoctoral associate at MIT in the Department of Materials Science and Engineering. She joined MIT from the University of Toronto, where she received her master's degree and Ph.D. in materials science. Dr. Chachra has a bachelor's degree in Engineering Science, also from the University of Toronto. She was a recipient of a National Sciences and Engineering Research Council of Canada postdoctoral fellowship and a Medical Research Council of Canada graduate fellowship, as well as numerous other academic honors.

Mark L. Chang, Ph.D.
Assistant Professor of Electrical and Computer Engineering

Dr. Chang received his Ph.D. in electrical engineering from the University of Washington. He received his M.S. in electrical and computer engineering from Northwestern University and his B.S. from Johns Hopkins University. During his studies Dr. Chang earned an Intel Foundation Graduate Fellowship. Dr. Chang has conducted research in developing computer-aided design tools and methodologies for easier implementation of arithmetic hardware onto FPGA devices. His research interests include FPGA arithmetic and architecture, computer-aided design tools, reconfigurable computing and VLSI design.

Rebecca Christianson, Ph.D.
Assistant Professor of Applied Physics

Dr. Christianson joined the Olin College faculty from Harvard University, where she was completing her postdoctoral research in light scattering and microscopy studies of self-assembly kinetics in two-component colloidal systems, anisotropic colloids, and surfactant systems. Dr. Christianson recently received a teaching award from the Derek Bok Center for Teaching and Learning at Harvard University. Among published journals and reviews, she and her colleagues have recently submitted Crystallization Kinetics of Binary Colloidal Alloys, which contains results from the Physics of Colloids in Space experiment that flew on the International Space Station in 2001. Dr. Christianson received her Ph.D. from MIT and her B.S. in physics and B.A. in music both from Stanford University.

Diana Dabby, Ph.D.
Associate Professor of Electrical Engineering and Music

Dr. Dabby has taught at MIT, Tufts University and Juilliard. She received her Ph.D. and M.S. degrees in electrical engineering and computer science from MIT and a B.S. in electrical engineering from City College of New York. In addition, she holds an M.F.A. in music from Mills College as well as a B.A. in music from Vassar College. While at MIT, Dr. Dabby combined music and engineering in her application of chaos theory to musical variation. She has given a number of concert/lectures on her work sponsored the National Association of Schools of Music, MIT, Princeton, Cornell, Dartmouth, IEEE, FIRST Place of New Hampshire, New Horizons in Science, and Harvard. She has

been heard on NPR member station WBUR-FM as well as at the Siemens Foundation "Beautiful Minds, Beautiful Music" Symposium at Carnegie Hall. As a concert pianist, Dr. Dabby has performed solo concerts in New York's Weill (Carnegie) Recital Hall, Merkin Concert Hall and at venues in Budapest and Hong Kong, among others. As a chamber musician, and as a composer, she has performed at Boston's Jordan Hall, Symphony Hall and at Tanglewood. Her latest work, September Quartet, a 5-movement work scored for voices, winds, brass, percussion, violin and piano, was commissioned to commemorate the 150th anniversary of the founding of Tufts University.

Helen Donis-Keller, Ph.D.
Professor of Biology and Art

Dr. Donis-Keller was previously at the Washington University School of Medicine, where she was a professor of surgery and director of the Division of Human Molecular Genetics. She has also held leadership positions in the biotechnology industry, where she led a group that developed the first genetic linkage map of the human genome. Dr. Donis-Keller holds an M.F.A. in studio art from the School of the Museum of Fine Arts in Boston and Tufts University and a Ph.D. in molecular biology and biochemistry from Harvard University. She also received an honorary doctor of science from Lakehead University. Dr. Donis-Keller enjoys combining her interests in art and science. Her "scientific" artwork is featured in exhibits across the nation.

Allen Downey, Ph.D.
Associate Professor of Computer Science

Before coming to Olin, Dr. Downey taught at Colby College and Wellesley College and held research positions at the San Diego Supercomputer Center and Boston University. His research is based on the application of the tools of empirical science to computer systems and networks. Dr. Downey is the author of several textbooks, including three versions of How to Think Like a Computer Scientist, an introduction to computer science using Java, C++ or Python. He received his Ph.D. in computer science from University of California, Berkeley. His B.S. and M.S. degrees are from MIT in civil engineering.

Ozgur Eris, Ph.D.
Assistant Professor of Mechanical Engineering and Design

Dr. Eris joined Olin from Stanford University, where he was the associate research director of the Center for Design Research. His current research is in design cognition and information systems. He has authored several award winning NSF and NASA research proposals, and a recent book on the question asking processes of design teams. Professionally, he has designed systems ranging from a pneumatic sample delivery machine to a railroad control center. He earned a B.S. (cum laude) from the University of Washington in mechanical engineering, and M.S. and Ph.D. degrees from Stanford University in mechanical engineering design.

John Geddes, Ph.D.
Associate Professor of Mathematics

Prior to joining the Olin faculty, Dr. Geddes was an assistant professor of mathematics at the University of New Hampshire, where he worked on laser-based chaotic communication schemes and pulse dynamics in mode-locked lasers. He currently receives funding from the NIH for a project on the mathematics of microvascular blood flow. Dr. Geddes graduated from Heriot-Watt University, Edinburgh, Scotland with a B.Sc. in physics. He received his Ph.D. in applied mathematics in from the University of Arizona.

Stephen S. Holt, Ph.D.
Professor of Physics and Babson College Director of Science

The former director of space sciences at the NASA-Goddard Space Flight Center, Dr. Holt is a leader in the field of X-ray astronomy. He was the NASA project scientist on eight NASA missions, including cooperative scientific mis-

sions with the UK, Germany, Japan and Russia; he was also chief scientist for the Space Station Project at NASA. Dr. Holt's many accolades include NASA's highest civilian honor, the Distinguished Service Medal. Since coming to Olin, he has received COSPAR's International Scientific Cooperation Medal and has been elected to fellowship in the International Academy of Astronautics. He has chaired Astrophysics Divisions of American Physical Society, American Astronomical Society, and COSPAR. His research focuses on high energy astrophysics, supernovas, and black holes. Dr. Holt received a B.S. degree with honors in engineering physics and a Ph.D. in physics from New York University.

David V. Kerns, Jr., Ph. D.
Provost and Franklin and Mary Olin Distinguished Professor of Electrical and Computer Engineering and Babson College Professor of Technology Entrepreneurship

Dr. Kerns formerly held the Orrin Henry Ingram Distinguished Professorship in the Department of Electrical Engineering at Vanderbilt University, where he also directed the Management of Technology Program. He is the past-president of the IEE Education Society, a fellow of IEEE, author of numerous technical papers, and holder of ten patents. His research interests include MEMS devices, analog circuit design and engineering education. A recipient of the IEEE Millennium Award, he has founded several successful technology enterprises. Acclaimed for outstanding scholarship and teaching, he is the co-author of two successful textbooks: Introduction to *Electrical Engineering* and *Essentials of Electrical and Computer Engineering*. He received his B.S., M.S., and Ph.D. degrees from Florida State University.

Sherra E. Kerns, Ph.D.
Vice President for Innovation and Research and F. W. Olin Professor of Electrical and Computer Engineering

Dr. Kerns is the past president of the American Society for Engineering Education (ASEE). She has authored over 100 published technical journal papers and made original contributions to enhancing information integrity in digital microelectronics in space. She serves on the Board of Directors and is a past- Commissioner and Executive Committee Member for the Accreditation Board for Engineering and Technology (ABET). She is also the former President of the National Electrical Engineering Department Heads Association. Dr. Kerns served on the NAE Engineering 2020 Committee, has played a number of leadership roles in FIRST (For Inspiration and Recognition of Technology), and is a NEASC team chair. A Fellow of the IEEE for her technical achievement and of ASEE for her educational contributions, Dr. Kerns is an acclaimed teacher. She is the recipient of the 1999 Harriet B. Rigas Outstanding Woman Engineering Educator Award and the IEEE Millennium Medal, among other honors. Dr. Kerns was previously chair of the Department of Electrical and Computer Engineering at Vanderbilt University. She received her A.B. from Mount Holyoke College, M.A. from the University of Wisconsin and Ph.D. from the University of North Carolina, all in physics.

Christopher Lee, Ph.D
Assistant Professor of Mechanical Engineering

Prior to joining the Olin College faculty, Dr. Lee was a lead engineer in the New Technologies Engineering Division at the Lawrence Livermore National Laboratory. He was responsible for supporting lab programs through computational analysis and vibration measurements. His projects ranged from buildings (vibration signature based system identification) to micro-devices (portable bio-pathogen and chemical detectors, accelerometers, adaptive optics arrays) to medical systems (catheter-based device for the treatment of cerebral aneurysms, retinal prosthesis, novel

breast cancer imaging system). He has co-patented a carbon-nanotube based acoustic sensor. His current areas of research are in the areas of stochastic system identification for structural damage detection, nonlinear dynamics, and the mechanics of DNA.

Dr. Lee has a B.S.E. degree in Mechanical Engineering from Cornell University. He has M.S.E. degrees in both Mechanical and Aerospace Engineering and a Ph.D. degree in Mechanical Engineering from the University of Michigan.

Benjamin Linder, Ph.D.
Assistant Professor of Mechanical Engineering

Dr. Linder is a designer and researcher currently investigating approaches to new product development and sustainable product design. He is also actively involved in entrepreneurship and is studying business structures for social ventures. Recently, he co-founded a software company focused on delivering product development tools to large manufacturing firms. Dr. Linder received a B.S.E. in Mechanical Engineering and a B.S.E. in Electrical Engineering from the University of Michigan where he studied engineering design. He received his M.S. and Ph.D. in Mechanical Engineering from MIT, where he studied product design and design education.

Caitrin Lynch, Ph.D.
Assistant Professor of Humanities and Social Sciences

Assistant Professor of Humanities and Social Sciences

Dr. Lynch received her Ph.D. and M.A. in cultural anthropology from the University of Chicago and her B.A. in anthropology from Bates College. Prior to joining the Olin faculty, Dr. Lynch was an assistant professor of anthropology at Drew University. Additional professional experience includes several fellowships, including a Mellon Postdoctoral Fellowship at Johns Hopkins University. Her research interests include gender, labor, nationalism and globalization; her areas of focus are South Asia (specifically, postcolonial Sri Lanka) and the United States. She is co-founder of the Rebuild Sri Lanka Solar Initiative, a non-profit group working with the Solar Electric Light Fund (SELF) to bring solar power to the tsunami-ravaged coast of Sri Lanka. Dr. Lynch speaks Sinhala and Tamil.

Robert Martello, Ph.D.
Assistant Professor of the History of Science and Technology

Prior to joining Olin, Dr. Martello was a lecturer at MIT and was the digital history annotations and features producer for the Sloan Foundation's American history textbook, *Inventing America*, published by W.W. Norton in 2003. He was also active as an environmental consultant. His primary research interests include the interdisciplinary examination of historical narratives from technological, environmental and entrepreneurial perspectives. Dr. Martello's current research uses Paul Revere's career to tell the story of America's progress through simultaneous political and industrial revolutions, and he has offered public lectures on these topics at various Boston-area institutions. Dr. Martello received his Ph.D. from MIT's program in the History and Social Study of Science and Technology. He received an M.S. degree from MIT's Department of Civil and Environmental Engineering and a B.S. degree from MIT in the field of earth, atmospheric and planetary science.

Richard K. Miller, Ph.D.
President and Professor of Mechanical Engineering

As dean of the College of Engineering at the University of Iowa, where he served before joining Olin, Dr. Miller created the nation's first Technological Entrepreneurship Certificate Program for engineers. His research interests include structural dynamics and nonlinear mechanics. He is the author or co-author of 100 reviewed journal articles and other technical publications. Other interests include innovation in undergraduate education and entrepreneurship. Dr. Miller has won five teaching awards at

two universities. He earned his B.S. degree in aerospace engineering from the University of California, Davis. He earned his M.S. degree in mechanical engineering from MIT, and his Ph.D. in applied mechanics from the California Institute of Technology.

Bradley A. Minch, Ph.D.
Associate Professor of Electrical and Computer Engineering

Prior to joining the Olin College faculty, Dr. Minch was an assistant professor at Cornell University in the School of Electrical and Computer Engineering. During his time at Cornell, he was the recipient of three teaching awards and one freshman advising award. In 2000 he received an Early CAREER Award from the NSF. Dr. Minch's research interests are in the areas of analog and mixed-signal integrated circuit design. Dr. Minch received his Ph.D. from the Computation and Neural Systems program at the California Institute of Technology, where he worked in the laboratory of Professor Carver Mead. He received his B.S. in electrical engineering from Cornell University.

Michael Moody, Ph.D.
Dean of Faculty and F. W. Olin Professor of Mathematics

Dr. Moody was previously the Diana and Kenneth Jonsson Professor of Mathematics, and chairman of the Department of Mathematics at Harvey Mudd College. He is recognized nationally for his work in mathematics curriculum development. His research is in the area of theoretical population genetics and evolutionary biology. Prior to serving at Harvey Mudd, Dr. Moody spent 13 years on the faculty of Washington State University, where he held a joint appointment in mathematics and genetics. He received his Ph.D. in applied mathematics from the University of Chicago and his B.A. in mathematics and chemical physics from the University of California, San Diego.

Christopher Morse, Ph.D.
Visiting Assistant Professor of Chemistry

Before coming to Olin College, Dr. Morse was a faculty member in the chemistry department at Tufts University where his courses covered both graduate and undergraduate curricula. At Tufts he served as the Graduate Training Coordinator, with the responsibility for the pedagogical training of the graduate students, especially those interested in careers in academia. He also successfully ran the Summer Institute on College Teaching for seven years, a program that trained graduate students in educational skills, and then paired them with veteran faculty members to co-teach courses. Before Tufts, Dr. Morse was at MIT where he received his doctoral degree in inorganic chemistry in the lab of Alan Davison as a National Science Foundation Predoctoral Fellow. The Davison lab focused on the creation of radiopharmaceuticals for use as imaging and therapeutic agents. Dr. Morse worked on the synthesis and reactivity of a class of rhenium and technetium organometallic complexes. While at MIT, he also served as the chemistry liaison and taught chemistry courses through the Experimental Study Group. During his summers, Dr. Morse taught chemistry for Project Interphase, which prepared underrepresented minorities from rural and urban areas for the rigors of first-year courses. For this effort, he was awarded the Goodwin Medal for excellence in teaching by a graduate student. He also holds an A.B. from Dartmouth College. At Olin, Dr. Morse teaches courses in general and organic chemistry. He is currently working on a textbook for a course about art, art history and art preservation from a chemical perspective. Dr. Morse remains interested in pedagogy training and his current focus is on using cooperative education to teach critical thinking through chemistry and the role of math skills for success in the sciences. While at Olin he hopes to expose students to the wonders of the puzzle world through a co-curricular.

José Oscar Mur-Miranda, Ph.D
Assistant Professor of Electrical and Computer Engineering

Before coming to Olin, Dr. Mur-Miranda was an Associate Professor of Electrical Engineering at the Inter American University of Puerto Rico, Bayamón Campus. Prior to that, he was a research consultant in energy harvesting systems at the Centre Nacional de Microelectrònica in Barcelona, Spain. He received his Ph.D. in Electrical Engineering and Computer Science from MIT, with a dissertation on electrostatic vibration-to-electric energy conversion under Prof. Jeffrey H. Lang. He earned a Master degree in 1998 and a B.S. degree in 1995 from MIT, both in electrical engineering.

Dr. Mur-Miranda has been actively involved in teaching since 1995 and has taught courses in electronic systems, electric circuits, electronic devices, communications, control and signal processing, and fields, forces and motion. He has also taught physics to incoming freshmen in MIT's Interphase summer program. He served in the Professional Education Policy Committee of the Electrical Engineering and Computer Science Department at MIT. Dr. Mur-Miranda is passionate about the welfare of students both inside and outside the classroom. His teaching style has been recognized by his students and peers as effective and engaging.

Dr. Mur-Miranda has designed and implemented industrial process control and automation systems for various pharmaceutical companies. His electrostatic vibration energy harvester is the first published design of its kind in the literature. His current research interests lie in the areas of energy harvesting and MEMS design, focusing on electromechanic energy transduction, ultra-low-power electronics and fault-resistant networks.

Dr. Mur-Miranda is a proud Catalonian born in Barcelona, Spain, from a Puerto Rican mother and a Spanish father from Aragón. He was raised between Spain and Puerto Rico until he became an "adopted" Bostonian in 1990.

Gill Pratt, Ph.D.
Associate Professor of Electrical and Computer Engineering

Dr. Pratt was previously an associate professor of Electrical Engineering and Computer Science at MIT. During his time at MIT, he was the recipient of an award for excellence in teaching and an NSF CAREER award. Dr. Pratt's research is in the area of robotics. He also has a strong interest in early engineering education and the societal aspects of technology. Dr Pratt received his B.S., M.S., and Ph.D. in Electrical Engineering and Computer Science from MIT. His Ph.D. work was in the area of signal encoding in the nervous system.

Joanne C. Pratt, Ph.D.
Associate Professor of Biological Sciences

Dr. Pratt joined Olin from the National Jewish Medical Research Center (NJC) in Denver, where she was an instructor in the Division of Cell Biology and the Department of Pediatrics. Before NJC, she was an instructor in pediatrics at Dana-Farber Cancer Institute and Harvard Medical School. She is a fellow of the American College of Surgeons. Funded in part by the Association for International Cancer Research, her immunology research is relevant to certain forms of cancer, such as leukemia and lymphoma, as well as AIDS and autoimmune diseases. Her research also includes surgical simulation and minimally invasive surgery for obesity. Dr. Pratt holds a Ph.D. in immunology from the University of Pennsylvania and an A.B. in biology from Smith College.

Stephen Schiffman, Ph.D.
Associate Professor of Entrepreneurship at Olin and Babson Colleges

Prior to joining the Olin faculty, Dr. Schiffman was the dean of the Undergraduate Program at Babson College and a senior partner at Olin College. In his two years as a Senior Olin Partner, Dr. Schiffman worked closely with the faculty to develop and improve the Olin curriculum. He has been a Babson faculty member in Entrepreneurship, Mathematics and MIS

since 1986. He was the architect of Babson's revised undergraduate curriculum, which launched in the fall of 1996. In 1997, the Pew Charitable Trusts recognized this effort by selecting Babson for a Pew Leadership Award for renewal of undergraduate education. Dr. Schiffman holds a Ph.D. in mathematics from Dartmouth College as well as an M.S. in management from the Sloan School at MIT. He has taught at the University of Colorado and Colorado College. Prior to joining Babson, he worked at Digital Equipment Corporation.

Christina Shea, M.F.A.
Visiting Assistant Professor of Arts, Humanities and Social Sciences

Ms. Shea is an independent writer, a novelist, and author of *Moira's Crossing* (Simon & Schuster, 2000), which was a Barnes & Noble Discover New Writers selection. She is also the coauthor of numerous Frommer's guides to Hungary and is currently at work on her second novel. She has been the recipient of a Bunting Fellowship at Radcliffe College as well as a Soros Foundation grant. In addition to her work at Olin, she is a core faculty member in the MFA program in Creative Writing at Lesley University. She has been associated with Olin since 2002, when she came aboard for two years as writing consultant. In 2005, she returned to teach a creative writing elective, and since then has signed on to teach creative writing to freshmen in the foundation and to mentor independent study in writing. She received her B.A. from Kenyon College and her M.F.A. from University of Michigan.

Alisha Sieminski, Ph.D.
Visiting Assistant Professor of Bioengineering

Dr. Alisha Lilly Sieminski comes to Olin from MIT, where she is a Ruth L. Kirschstein National Research Service Award post-doctoral fellow in the Biological Engineering Division. Dr. Sieminski earned a B.S. in Chemical Engineering from MIT and a Ph.D. in Bioengineering from the University of Pennsylvania. Dr. Sieminski's research interests revolve around how the cellular microenvironment affects cellular behavior — with a focus on cell-biomaterial interactions. She primarily investigates the formation of capillary-like networks by endothelial cells. Dr. Sieminski investigates the impact changing the biochemical environment, mechanical environment, biomaterial supports, cell source, system geometry, and the cellular contractile machinery has on the capillary network formation. Combining different factors leads to insights about their importance in endothelial cell processes. For example, some of her previous work showed that the balance between cell force generation and biomaterial support stiffness, not their absolute magnitudes, was the primary modulator of network formation. The overall approach of her work with endothelial cells, as well as neuronal and cartilage cells, is to gain insight into various processes by investigating the intersecting effects of having multiple stimuli or changing multiple variables on cell behavior. A native of the Pacific Northwest, Dr. Sieminski is gradually accepting East Coast living and finds Boston growing on her considerably. You will recognize Dr. Sieminski in classes as the one speaking quickly and enthusiastically about bioengineering while gesturing and drawing diagrams on the board.

Mark Somerville, Ph.D.
Associate Professor of Electrical Engineering and Physics

Dr. Somerville joined Olin from Vassar College, where he was assistant professor of physics. He strongly believes in the educational value of involving students in hands-on research and in integrating communication skills into the curriculum. His research focuses on the physics of semiconductor devices. Dr. Somerville holds M.S. and Ph.D. degrees in electrical engineering from MIT, as well as an M.A. in physics from Oxford University. He earned a B.S. in electrical engineering and a B.A. in English from the University of Texas at Austin. He was a Rhodes Scholar.

Lynn Andrea Stein, Ph.D.
Professor of Computer and Cognitive Science

Dr. Stein joined Olin from MIT, where she was an associate professor of computer science and directed a research group on interactive intelligent computer systems. Dr. Stein's pioneering approach to the teaching of computer science is based on this interactive model rather than the traditional linear view of computation. She studies ways to make computers smarter and humans more effective. She has built humanoid robots and intelligent rooms, next-generation (semantic) web infrastructure and philosophical theories. She is the recipient of the NSF Young Investigator Award and MIT's Spira Teaching Award. Dr. Stein was recently elected a Senior Member of the IEEE (Institute of Electrical and Electronics Engineers) and is among a select few (less than 10 percent of the membership) to achieve this level of professional membership. She has a B.S. (cum laude) in computer science from Harvard and Radcliffe Colleges and M.S. and Ph.D. degrees in computer science from Brown University.

Jonathan Stolk, Ph.D.
Assistant Professor of Mechanical Engineering and Materials Science

Dr. Stolk joined Olin College from Bucknell University, where he was a visiting assistant professor in the Chemical Engineering Department. He was voted "Bucknell's Favorite Professor" by first and second-year Bucknell students, and he received several teaching awards from the University of Texas at Austin. Dr. Stolk holds M.S. and Ph.D. degrees in materials science and engineering from the University of Texas at Austin and a B.S. in mechanical engineering from the University of Texas at Arlington. His current research interests include the synthesis of nanoscale metal alloys and electroactive metal-polymer composites, as well as non-traditional pedagogical approaches.

Brian D. Storey, Ph.D.
Associate Professor of Mechanical Engineering

Dr. Storey holds a Ph.D. from the University of California, Berkeley, a M.S. from the University of Illinois at Urbana-Champaign and a B.S. from the University of Texas at Austin, all in mechanical engineering. Dr. Storey's research interests are in the broad areas of fluid dynamics and computational science, including applications such as geophysical flows, cavitation, and microfluidics. Current research projects involve electrokinetic and electrochemical flows in microfluidic devices. Dr. Storey has received NSF funding to support undergraduate research at Olin.

Burt Tilley, Ph.D.
Associate Professor of Mathematics

Dr. Tilley joined Olin College from the New Jersey Institute of Technology. He was the recipient of an NSF NATO postdoctoral research fellowship at the Hydrodynamics Laboratory at the École Polytechnique in France. Dr. Tilley's general research interests include the stability and pattern formation of the interface between two fluids, the dynamics of fluid systems in the presence of large electric fields, mathematical modeling, and industrial applied mathematics. Dr. Tilley received a Ph.D. in applied mathematics from Northwestern University, a B.S. in electrical engineering and a B.A. in modern languages from the University of Lowell.

Jessica Townsend, Ph.D.
Assistant Professor of Mechanical Engineering

Before joining Olin, Dr. Townsend was a research associate in the Department of Aeronautics and Astronautics at MIT. She was also a post-doctoral associate at the FAA/NASA Center for Excellence for Aviation Noise and Emissions Mitigation at MIT. Her doctoral work was also done at MIT in the Gas Turbine Laboratory where she developed, tested and modeled evaporatively cooled turbine blades for advanced aircraft engines. Prior to returning to school for her doctorate, Dr. Townsend spent three years in industry at Hamilton Sundstrand

Power Systems, a manufacturer of auxiliary power units for commercial and military aircraft. She was the recipient of the AIAA Foundation Wilbur and Orville Wright and Gordon C. Oates Air breathing Propulsion Awards. Dr. Townsend also received an American Association of University Women Engineering Dissertation Fellowship. Her research interests include turbine blade cooling, nanofluids, and thermal-fluid systems. She received her M.S. in mechanical engineering from the University of California, Davis and B.S. in mechanical engineering from the University of Massachusetts Amherst.

Raymond Yim, Ph.D.
Assistant Professor of Electrical and Computer Engineering

Dr. Yim received his Ph.D. in electrical engineering from Harvard University. A native of Canada, he also holds a bachelor's degree and a master's degree in electrical engineering from McGill University in Montreal. His studies were supported by the Fonds de Recherche sur la Nature et les Technologies, the Natural Science and Engineering Research Council. Dr. Yim's industry experience includes internships at Nortel Networks and Mitsubishi Electric Research Laboratories. His main areas of research interest are networks, wireless communications, economics, optical communications and information theory.

Yevgeniya V. Zastavker, Ph.D.
Assistant Professor of Physics

Before joining Olin, Dr. Zastavker was a visiting assistant professor of Physics at Wellesley College where she taught physics and performed biophysics research. Born and raised in Kiev, Ukraine, she came to the United States in 1990 having received two years of education at the Kiev Pedagogical College and a degree from one of Kiev's schools of music. She graduated from Yale University with a B.S. in physics and holds a Ph.D. in biological physics from MIT. Her current research interests are twofold: Dr. Zastavker is investigating physicochemical properties of various biological and synthetic self-assembling membranes that have significant biomedical and industrial applications; she also performs science and engineering education research in collaboration with colleagues from the Civil Rights Project at Harvard University and TERC, Inc. Dr. Zastavker recently represented the United States at the IUPAP (International Union of Pure and Applied Physics) First and Second International Conferences on Women in Physics. She continues to work on the issues of women and minorities in science and engineering both through her research and active participation in various professional societies. Dr. Zastavker has received numerous outstanding reviews for her teaching both at MIT and Wellesley College.

Academic Partners

Woodie Flowers, Ph.D.
Distinguished Olin Partner

Dr. Flowers is the Pappalardo Professor of Mechanical Engineering at MIT. He received a B.S. from Louisiana Tech University and S.M., M.E. and Ph.D. degrees from MIT. His interests include creative design processes, product development systems, and innovations in education. At MIT, he has received several honors for extraordinary contributions to undergraduate education including a MacVicar Faculty Fellowship. Currently, Dr. Flowers is a director of three companies and serves as National Advisor for FIRST.

Joni Moody, J.D.
Senior Partner for Legal Studies

Ms. Moody's practice is limited to criminal defense (appellate only) and immigration law. She serves on the appellate panel for the Committee for Public Counsel Services, a state supported agency that provides legal services for indigent criminal defendants. She is admitted to practice in Massachusetts, and before

the United States District Court, D. Mass., and the First Circuit. Memberships include the American Immigration Lawyers Association, the National Association of Criminal Defense Lawyers, and the Federal Bar Association, as well as Suffolk County Litigation Inns of Court. Her pro bono work includes provision of legal services through Catholic Charities' Immigration and Asylum Clinic in Boston. Ms. Moody is a graduate of Roger Williams University Law School in Rhode Island. Prior to attending law school she was a graduate student academic advisor for ten years. At Olin she advises students who are considering a career in law and assists them with the law school admission process.

Janey Pratt, M.D.
Senior Olin Partner in Health Sciences

Dr. Pratt is a general surgeon, specializing in bariatric and oncologic surgery at the Massachusetts General Hospital, and an instructor in surgery at Harvard Medical School. She holds a B.A. degree from Wellesley College in chemistry and an M.D. from Tufts University School of Medicine. Dr. Pratt advises Olin students interested in pursuing health science post-graduate careers, including M.D. and M.D./Ph.D. degrees. Using her background in innovative medical technology and surgery, Dr. Pratt is a resource for students interested in medical technology. She is also involved in an advising family at Olin and assists classes when medical topics arise

Instructors and Consultants

David Anderson
Master Instructor of Mechanical Design and Fabrication

Prior to joining Olin, Mr. Anderson was an optomechanical engineer with Network Photonics, a start-up company developing all-optical switches for Dense Wavelength Division Multiplexing (DWDM) Networks. He was a founding employee and played an instrumental role in engineering the product from initial concept to production. Mr. Anderson's areas of interest and expertise include design, analysis manufacturing and testing of precision mechanical systems. Mr. Anderson frequently contributes software reviews to mechanical engineering trade journals. While at Olin, he has designed and developed a number of prototypes including an underwater device for freeing whales from lobster trap buoy line entanglement, initial concept robot prototypes, optical sensing devices and structures for marine applications. He received his B.S. in mechanical engineering from the University of Colorado at Boulder,

Bruce Andruskiewicz
Instructor of Machining

Before joining Olin College, Mr. Andruskiewicz worked in industry at Packard Machinery, where he served as a service applications manager and applications engineer. In this role he was responsible for providing technical programming support and customer training, as well as ordering and installing new machinery, including CNC machining centers, turning centers, manual mills, lathes, and support equipment. Mr. Andruskiewicz is a Class A machinist who has held industry positions for over twenty years with companies such as Laurel Brooke, Inc., Minuteman Labs, and Tech-Ridge. He is a graduate of the University of Massachusetts Amherst.

Gillian Epstein, Ph.D.
Consultant in Writing

Prior to joining Olin College, Dr. Epstein was a senior consultant and instructor for FreshPond Education, a professional development company. While at FreshPond Edu cation, she developed and led team-driven development programs that trained participants to create challenging curriculum projects in the humanities, implement a vigorous peer review process and use online publishing tools to share curriculum research and lesson development. Prior to her

position with FreshPond Education, Dr. Epstein was an instructor of composition and literature at the University of California, Berkeley, where she won a teaching award in 1999 and a Mellon research fellowship in 1999–2000. Dr. Epstein earned her Ph.D. from the University of California, Berkeley and her B.A. from Wesleyan University, both in English. Her academic interests include nineteenth-century American literature, novel theory and feminist theory.

Board of Trustees, President's Council, and Senior Administration

Board of Trustees

Lawrence W. Milas, L.L.B.
Chairman of the Board
President and Director, F. W. Olin Foundation, Inc.

Mr. Milas has been a Director of the F. W. Olin Foundation, Inc. since 1974 and has served as President since 1983. During his tenure, 42 building grants have been made by the Foundation totaling more than $200 million. In 1993 Mr. Milas proposed the establishment of Olin College to the Foundation Board, and he has led the development effort since the Board approved the concept in 1997. He was a partner in the former New York City law firm of Baer Marks & Upham, where he specialized in tax and trusts and estate law. Currently, he is Of Counsel to Brown, Raysman, Millstein, Felder & Steiner. Mr. Milas has received honorary degrees from Washington and Jefferson College, Whitman College, Roanoke College and the F. W. Olin Graduate School of Business at Babson College. He is a recipient of the Babson Medal from Babson College and served several terms on the college's Board of Trustees. A 1958 graduate of Babson College (with distinction), he received his L.L.B. degree from Columbia University in 1963.

William R. Cotter, J.D.
President Emeritus, Colby College

Mr. Cotter retired in November 2005 as President of the Oak Foundation in Boston, MA, an international philanthropic organization focusing on social and environmental issues around the globe. He served from 1979–2000 as president of Colby College in Waterville, Maine, where he remains a life trustee. Prior to joining Colby, Mr. Cotter was president of the African-American Institute in New York. He has also served as assistant attorney general in northern Nigeria, as an associate with a law firm in New York, as Representative of the Ford Foundation for Colombia and Venezuela, and as a White House Fellow. He has received numerous honors and awards, including four honorary degrees. Mr. Cotter serves on the boards of several academic, philanthropic, and governmental organizations. He is a graduate of Harvard College (A.B. 1958) and Harvard Law School (J.D. 1961).

Tamara P. Davis, M.A.
Managing Director, Levin & Company, Inc.

Tamara P. Davis is the Managing Director and leads the Corporate Governance Practice at Levin & Company, Inc. in Boston, where she consults with CEOs of entrepreneurial life science and technology companies relating to board composition, governance best practices, and building boards as strategic assets. Previously, Ms. Davis served as President, Chief Executive Officer, and Director of UST Leasing Corporation, an investment banking/financial services company in Boston. She was also formerly an Assistant Dean of Humanities at Santa Ana College in California and an educator within the Los Angeles City Schools System. Ms. Davis is Chairman of the Massachusetts State College Building Authority, a former Vice Chairman of the Massachusetts Educational Financing Authority, and a former board director of the Massachusetts Board of Higher Education. She also serves on several corporate, academic and nonprofit boards. Ms. Davis earned an M.A., summa cum laude, from California State University and a B.A. from University of California, Los Angeles.

C. Scott Gibson
CEO, Gibson Enterprises

Mr. Gibson is CEO of Gibson Enterprises, a venture capital firm. He has spent more than a decade as an investor and serving as Chairman of Radisys Corporation and four other public companies, as well as a director of several nonprofits. Prior to founding Gibson Enterprises, Mr. Gibson was the co-founder and president of Sequent Computer Systems, which reached $800 million in annual sales before being sold to IBM. Previously, Mr. Gibson was employed for seven years by Intel Corporation, where he held various management positions, including

General Manager of the Memory Components Operation and Marketing Manager for the Development Systems Operation. Mr. Gibson received his M.B.A. in Finance and his B.S. in Electrical Engineering from the University of Illinois. He was awarded the Lifetime Achievement Award from Oregon Entrepreneurs Forum in 2001 and was recognized as American Electronics Association's Oregon High Tech Executive of the Year in 1990.

William F. Glavin, M.B.A.
President Emeritus, Babson College

Mr. Glavin retired in 1997 as President of Babson College, where he served for eight years. As Babson's ninth President, he is credited with advancing the school's curriculum and national reputation. Mr. Glavin joined Babson after holding several leadership positions, including Vice Chairman, at the Xerox Corporation. Prior to joining Xerox in 1970, he held a number of senior executive positions with IBM. Mr. Glavin has received numerous honors and awards, including honorary Doctor of Laws degrees from both The College of the Holy Cross and Babson College, as well as the Distinguished Alumni Award from the University of Pennsylvania. He has served on the board and advisory councils of several corporations and academic institutions. He received his B.S. from The College of the Holy Cross and his M.B.A. from the Wharton School of the University of Pennsylvania.

Carla L. Gude, M.A.
Former Vice President of Technology, IBM

Ms. Gude was Vice President of Technology, IBM Corporate Staff, Somers, NY. She is an experienced executive and information systems professional with 32 years of experience with IBM in a wide variety of management and executive positions for software product development, information technology and corporate technical strategy. In her many years with IBM she served in various positions including Vice President of Systems Software, Director of Enterprise Workgroup Networking Software, Director of Process Support and Application Architecture, and Manager of Information Systems. She is a member of the Board of Directors of the National Technological University. Ms. Gude received her B.A. from Vassar College and her M.A. from Cornell University, both in mathematics.

Robert N. McBurney, Ph.D.
Senior VP, Research & Development, Chief Scientific Officer, BG Medicine, Inc.

Dr. McBurney is Senior V.P., Research & Development and Chief Scientific Officer at BG Medicine, Inc. He has over 25 years of experience in biomedical research and management. His responsibilities have ranged from conducting independent, internationally recognized medical research, to leading an emerging U.S. biopharmaceutical company, Cambridge NeuroScience (now CeNeS Pharmaceuticals, Inc.). A physiologist by training, Dr. McBurney served on the faculty of the Medical School of Newcastle University for nine years. He has also served on the research staff at the National Institutes of Health in Bethesda, MD, the Physiological Laboratory of Cambridge University and the Medical School of the University of New South Wales. Dr. McBurney initiated and managed a project to discover a novel pharmaceutical treatment to limit brain damage following stroke and head injury. He also has extensive experience in the business development activities of a young biotech company. An author of many scientific papers, Dr. McBurney serves as Vice President of the Australian-New Zealand-American Chamber of Commerce of New England. He received his Ph.D. from the University of New South Wales in physiology.

Richard K. Miller, Ph.D.
Ex-Officio
Founding President, Franklin W. Olin College of Engineering
Professor of Mechanical Engineering

Before joining Olin College as its Founding President, Dr. Miller served as Dean of the College of Engineering at the University of Iowa from 1992–99. He spent the previous

17 years on the faculty of the University of Southern California in Los Angeles and the University of California, Santa Barbara. He has published extensively in the field of applied mechanics and has been recognized for teaching excellence. He serves on the board and advisory councils of several academic institutions and one corporation. He received the Distinguished Engineering Alumni Award from the College of Engineering at the University of California, Davis, where he received a B.S. (with highest distinction) in 1971. He also received an M.S. from MIT in 1972 and a Ph.D. from Caltech in 1976. Dr. Miller received the Legacy of Iowa Engineering Award from the University of Iowa College of Engineering in 2006.

William B. Norden, J.D.
Director, Secretary and Counsel, F. W. Olin Foundation, Inc.
Partner, Brown Raysman Millstein Felder and Steiner LLP

Mr. Norden is a partner in the law firm of Brown Raysman Millstein Felder and Steiner LLP in New York City and has extensive experience in legal matters related to trusts and estates and charitable organizations. He has been a Director of the F.W. Olin Foundation, Inc. since 1988 and has served as Secretary and Counsel to the Foundation since 1983. Mr. Norden also serves on the Board of the Samuel and Rae Eckman Charitable Foundation, Inc., the New York City Fire Museum and the Honor Emergency Fund of the Fire Department of the City of New York. He received his B.S. in economics from Brooklyn College in 1967 and his J.D. from the New York University Law School in 1969.

John W. Prados, Ph.D.
Vice President Emeritus and University Professor, University of Tennessee
President Emeritus, Accreditation Board for Engineering and Technology (ABET)

Dr. Prados is Vice President Emeritus and University Professor in the Department of Chemical Engineering at The University of Tennessee, where he spent more than 45 years. He is a former editor of the Journal of Engineering Education of the ASEE and is a past President of the Accreditation Board for Engineering and Technology (ABET). Dr. Prados is Director and current Treasurer of AIChE, and has served as Executive Counselor of Tau Beta Pi, President and Treasurer of Sigma Xi, Chair of the Engineering Accreditation Commission of ABET, Senior Education Associate at the NSF, and advisor and consultant to more than 30 universities and state education agencies in the U.S. and abroad. His awards and honors include the L.E. Grinter Distinguished Service Award of ABET. He received his B.S. at the University of Mississippi and his M.S. and Ph.D. at The University of Tennessee, all in chemical engineering.

President's Council

The President's Council is a group of distinguished advisors who volunteer their time to counsel the president on a full range of issues relating to curriculum, student life, administration and finance, governance, admission and other topics important to the college.

John E. Abele

Founder Chairman of Boston Scientific, a $6 billion medical device company known for pioneering "less invasive medicine"

James E. Ashton, Ph.D.

Chairman of five companies in Materials, Software, and Manufacturing and President of Ashton Capital Partners, a small private equity firm

Atul Bhatnagar, Ph.D.

Vice President and General Manager, Enterprise Data Networks, Nortel Networks

Stephen W. Director, Ph.D.

Provost and Senior Vice President, Drexel University; former Dean of Engineering at the University of Michigan; and Chair of the National Academy of Engineering Committee on Engineering Education

George N. Hatsopoulos, Ph.D.

Founder and CEO Pharos, LLC and Founder and Chairman Emeritus of Thermo Electron Corporation

Paul C. Jennings, Ph.D.

Provost and Professor of Civil Engineering and Applied Mechanics, California Institute of Technology. Formerly Caltech's Vice President and Provost, Acting Vice President for Business and Finance, and Chairman of the Division of Engineering and Applied Science

Wayne C. Johnson, M.B.A.

Vice President, University Relations Worldwide, Hewlett-Packard Company

R. Mike Lockerd, P.E.

Principal, Mike Lockerd Associates

Melvin R. Ramey, Ph.D.

Professor Emeritus of Civil and Environmental Engineering at the University of California at Davis and renowned teacher and student adviser

Kwan Rim, Ph.D.

Chairman of Samsung Advanced Institute of Technology in Korea, Chairman of the Board of Directors of Korea Advanced Institute of Science & Technology, and Chairman of IMS International (International consortium for cooperation in intelligent manufacturing systems)

Sheri D. Sheppard, Ph.D.

Professor of Engineering at Stanford and Senior Scholar at the Carnegie Foundation for the Advancement of Teaching

Lee S. Shulman, Ph.D.

President of the Carnegie Foundation for the Advancement of Teaching and Charles E. Ducommun Professor of Education Emeritus, Stanford University

Ralph Z. Sorenson, D.B.A.

General Partner of the Sorenson Limited Partnership and President Emeritus, Babson College

B. Samuel Tanenbaum, Ph.D.
Chair

Professor Emeritus and former Dean of Faculty at Harvey Mudd College in Claremont, CA

Gregs G. Thomopulos

President and CEO, Stanley Consultants, Inc.

Jeffry A. Timmons, D.B.A.

Franklin W. Olin Distinguished Professor of Entrepreneurship and Founding Director of the Price-Babson Fellows Program at Babson College

Carol Tomlinson-Keasey, Ph.D.

Founding Chancellor of University of California at Merced, the UC's 10th campus located in the Central Valley of California

David A. Walker

Retired President, CEO, and Founder of Pharaoh Corporation in Rochester, NY

Lilian Wu, Ph.D.

Program Executive, University Relations and Innovation, IBM Corporate Technology

William A. Wulf, Ph.D.

President of the National Academy of Engineering, Washington, DC

Senior Administration

Richard K. Miller, Ph.D.
President and Professor of Mechanical Engineering

Dr. Miller was appointed founding president of the Franklin W. Olin College of Engineering on February 1, 1999. He also holds an appointment as a professor of mechanical engineering. Before joining Olin College, he served as dean of the College of Engineering at the University of Iowa from 1992–99. At Iowa he initiated a comprehensive curriculum revision, a major facilities expansion and modernization project, the first major private capital campaign for the College of Engineering, an innovative Technological Entrepreneurship Certificate program, and an increase in external research funding by more than 50 percent. He spent the previous 17 years on the engineering faculties at the University of Southern California (where he held the position of associate dean for academic affairs) and the University of California, Santa Barbara. With research interests in earthquake engineering and aerospace structural design, he has served as a consultant to many aerospace companies and directed research programs funded by the National Science Foundation, NASA, and industry. Dr. Miller has published extensively in the field of applied mechanics, and has won five awards for teaching excellence. He earned a B.S. in aerospace engineering from the University of California, Davis in 1971, and is the recipient of the 2002 Distinguished Engineering Alumni Award from that institution. He received an M.S. in mechanical engineering from MIT in 1972, and a Ph.D. in applied mechanics from Caltech in 1976. He is a member of the Board of Trustees of Babson College, the Board of Directors of The Stanley Group, and serves on several advisory boards for the government, non-profit organizations and universities. He is also a member of AIAA, ASCE, ASEE, and ASME.

David V. Kerns, Jr., Ph.D., P.E.
Provost and Franklin and Mary Olin Distinguished Professor of Electrical and Computer Engineering

Dr. Kerns, formerly the Orrin Henry Ingram Distinguished Professor of Engineering Management and professor of electrical engineering at Vanderbilt University in Nashville, Tennessee, became provost and the Franklin and Mary Olin Distinguished Professor of Electrical Engineering on September 1, 1999. Before joining Olin, Dr. Kerns served at Vanderbilt University for 12 years as chair of the Department of Electrical Engineering, director of the Management of Technology Program, associate dean for administration of the School of Engineering, and acting dean of the School of Engineering. He has published extensively, has patents in microelectronics, MEMS, and optics and has directed large, funded research programs. He is a fellow of the IEEE, recipient of IEEE's Millennium Medal, and the founder of two successful technology start-up companies. Recognized for outstanding undergraduate teaching and author of an undergraduate textbook in electrical engineering, Dr. Kerns is an officer of the IEEE Education Society and former chairman of the international Frontiers in Education Conference. Dr. Kerns served as founding chairman of the Department of Electrical Engineering at Florida State University/Florida A&M University, and was also on the faculty at Auburn and Bucknell Universities. He also served for several years as a member of the technical staff at Bell Laboratories.

Sherra Kerns, Ph.D.
Vice President for Innovation and Research and F. W. Olin Professor of Electrical and Computer Engineering

Dr. Sherra E. Kerns joined Olin College on September 1, 1999 to assume a position unique in higher education: she is responsible for providing opportunities for students to learn through discovery, enhancing faculty and student intellectual vitality, and helping the Olin community continually improve its effectiveness in supporting learning. Dr. Kerns came to Olin from Vanderbilt University, where she chaired the Department of Electrical and Computer Engineering and directed the multidisciplinary, multi-institutional University Consortium for Research on Electronics in Space. She has also served on the faculties of North Carolina State University and Auburn University. Dr. Kerns serves on the Advisory Committee for the National Academy of Engineering's Center for the Advancement of Scholarship on Engineering Education and the Steering Committee for the NAE Engineer of 2020 Phase II: Engineering Education in the New Century initiative. She currently serves as member of the ABET Engineering Accreditation Commission (EAC) and its Executive Committee. Her work has been recognized by local, national and international awards, both for excellence in research and for inspirational teaching. A Fellow of the IEEE, Dr. Kerns is the recipient of IEEE's Millennium Medal and the IEEE Education Society's Harriet B. Rigas Award. An award-winning teacher and author of an undergraduate textbook, Dr. Kerns has published more than 100 technical journal papers. Dr. Kerns is a Fellow of the American Society for Engineering Education. She is the former President of ASEE.

Stephen P. Hannabury, M.B.A.
Vice President for Administration and Finance

Mr. Hannabury, the former assistant dean and chief financial, administrative and information officer at the School of Management at Boston University, became vice president for administration and finance on August 11, 1999. A member of the BU staff for 14 years, Mr. Hannabury was project manager for the design, construction and operation of the School of Management's $110 million classroom and office building, one of the most ambitious projects of its kind in the country. He restructured the school's financial administration to provide new standards for quality control, productivity, and customer service. He also led changes which transformed the school into a leader in computer technology at BU and nationally. At Olin he is responsible for financial and administrative affairs and the development of the college's state-of-the-art campus.

His areas of responsibility include financial and strategic planning, human resources, public safety, risk management and campus services, as well as campus planning and construction.

Charles S. Nolan, Ph.D.
Vice President of External Relations and Dean of Admission

Dr. Charles Nolan became the Vice President for External Relations and Dean of Admission on June 1, 2006. He was the former Vice Provost for Enrollment Management at Santa Clara University in Santa Clara, Calif. For four years prior to that appointment, Dr. Nolan was the founding Dean of Admission at Olin College. He has over 30 years of experience in the field of admission and recruiting, serving as Director of Admission at Bentley College, Director of Undergraduate Admission at Boston College, Assistant Provost and Dean of Undergraduate Admission at Washington University in St. Louis and Dean of Undergraduate Admission at Babson College, where he successfully led an enrollment program that substantially increased applications and the SAT scores of incoming freshmen. He is highly regarded nationally for his achievements in modern recruiting techniques. Dr. Nolan received a Ph.D. in Higher Education Administration from Boston College and a B.A. in history from Curry College. He has served as a consultant for several colleges and universities, spoken at regional and national conferences on innovative ways to involve the whole campus in attracting and retaining high quality students and co-authored a chapter on admission published in *Global Cases in Benchmarking.*

Michael E. Moody, Ph.D.
Dean of Faculty and F. W. Olin Professor of Mathematics

Dr. Moody joined Olin College from Harvey Mudd College, an engineering-focused member of the Claremont colleges in California. At Harvey Mudd, Dr. Moody was the Diana and Kenneth Jonsson Professor of Mathematics and chair of the mathematics department. While there, he played a major role in a comprehensive curriculum design effort and built the mathematics department into one of the finest in the country. Dr. Moody received his B.A. degree from the University of California at San Diego in 1975, and completed a Ph.D. in applied mathematics at the University of Chicago in 1979. In 1981 he joined the faculty at Washington State University. His appointment at Harvey Mudd began in 1994. Dr. Moody's research in biomathematics focuses on genetic models for evolving populations. His developmental work in teaching is concentrated on designing and implementing curricular models and technological tools to improve mathematics education for engineers and scientists. At Olin, he is responsible for creating a strong academic and administrative infrastructure to advance the college's unique educational mission. In particular, he is focused on developing Olin's innovative curriculum and recruiting outstanding faculty.

Roger ("Rod") C. Crafts, Jr., Ed.D.
Dean of Student Life

Dr. Crafts joined Olin College in August 2000 from Brandeis University, where he was dean of student affairs. He has also held student affairs positions at the University of Rhode Island and Indiana University. Dr. Crafts is known nationally for his creative innovations in the delivery of student services, his dedicated and cohesive staff, and his leadership in professional organizations. Under his leadership, Brandeis revamped its student judicial system, joined the prestigious University Athletic Association, established an Intercultural Center and combined the functions of residence life and student activities into one office. At Olin, he is responsible for helping to establish and preserve a rich and diverse campus life that enhances student academic experiences. Among the areas reporting to him are academic advising, residence life, athletics and recreation, student activities, judicial affairs, health services, spiritual life and personal counseling. Dr. Crafts holds a B.A. from Earlham College and a M.S. in education and Ed.D. from Indiana University.

Joanne Kossuth, M.S.
Associate Vice President for Development and Chief Information Officer

As Associate Vice President for Development, Ms. Kossuth has primary responsibility for integrating and coordinating Olin's efforts in fund raising. In addition to her development duties, she is responsible for fostering non-academic relationships with neighboring institutions, including Babson, Wellesley and Brandeis. She also holds the title of Chief Information Officer at the college. In this role, she has had a unique opportunity to design fully converged leading-edge technology facilities at Olin College from scratch, as well as to implement best IT practices from a 'clean slate.' Her IT leadership led to her being named one of Computerworld's Premiere 100 CIOs in 2005. Her previous experience includes Systems Manager at Fisher College, Director of Information Technology at Wheelock College and Director of Computer Support Services at the Boston University School of Management. Ms. Kossuth's professional background includes a B.A. from Holy Cross College and a M.S. from Lesley University with a concentration in developing and implementing information systems for small businesses. She also received technical certifications in areas such as network and security engineering from Novell, SANS, and Microsoft. She has been involved for a number of years in EDUCAUSE, a nonprofit association whose mission is to advance higher education by promoting the intelligent use of information technology. Most recently she was selected as Chair of the 2020 committee focused on insuring the future relevance of EDUCAUSE to its members. Her publications include: "Attracting Women to Technical Professions," and "Building Relationships Means Better IT Contracts," both published in *EDUCAUSE Quarterly*. In addition, Ms. Kossuth is Chair of the Board of NERCOMP (Northeast Regional Computing Program), an EDUCAUSE affiliate. She also serves as a member of the Town of Needham's Technology Advisory Committee.

Appendices

Academic Partnerships

The purpose of Olin's academic partnerships is to enhance Olin students' opportunities for learning, growth, and career development. A close partner is also our closest neighbor: Babson College. Babson, known for its commitment to innovation and entrepreneurship, is the perfect partner for an engineering college that wants to incorporate business and entrepreneurial thinking into its curriculum. Wellesley College is a strong partner and provides our students access to a wide range of exceptional courses, particularly in the humanities and social sciences. Wellesley students also take courses at Olin in topics such as introduction to design. Brandeis University is also a vital partner, as well as an array of local industries.

Babson College Partnership

The Olin/Babson partnership builds on exciting synergies between business and engineering to enhance the resources and opportunities available to both institutions for innovative teaching, learning and research. Olin faculty continue to work closely with the Babson faculty to develop modules in entrepreneurship and business basics that are integrated into the Olin curriculum. Babson College has recently introduced a M.S. in Management in Technological Entrepreneurship tailored for Olin students. The two institutions have also made several joint faculty appointments, and sponsor a joint academic center, the Sloan Center for Online Education (SCOLE).

Cross-registration Agreements

Olin has cross-registration agreements with Babson College, Wellesley College, and Brandeis University to increase the academic offerings available to Olin students in the natural sciences, arts, humanities, and social sciences. Through international study opportunities — including a number of joint agreements and special arrangements coordinated by the Olin Study Away Program — the opportunities for learning and growth literally extend from the Olin campus to the whole world.

Partnerships with Industry

As students move through the Olin program, the college's hands-on approach is designed to provide increasing opportunities for corporate experiences and real-world learning. Olin has reached out to the local high-tech community, home to some of the most innovative companies in the world, to provide these learning experiences, including internships and corporate sponsorship of research and design projects. Moreover, Olin is seeking to involve corporations and corporate leaders in the development of the college in such areas as curriculum, career planning, and student recruitment. Many of the most innovative companies have representatives on Olin's President's Council.

Plans for Accreditation

Olin's curriculum provides the depth, breadth, cohesion and rigor necessary to produce fully qualified engineering graduates. The three major degree programs (Electrical and Computer Engineering, Engineering, and Mechanical Engineering) have been designed to meet the general criteria outlined by the Accreditation Board for Engineering and Technology (ABET).

In addition, Olin's Mechanical Engineering and Electrical and Computer Engineering degree programs have been designed to meet the applicable ABET program criteria for these areas. ABET accredits programs based on a campus visit and thorough review of graduates' records and educational outcomes assessments. Olin's review for initial ABET accreditation is scheduled for the fall of 2006.

At the institutional level, Olin has worked to conform to the requirements of the New England Association of Schools and Colleges (NEASC), Commission on Institutions of Higher Education, the pertinent regional accreditation body. Olin achieved Candidacy Status during the 2003-2004 academic year. Candidacy establishes a formal relationship with NEASC and indicates that Olin is progressing toward accreditation. The college was visited by a NEASC team again in the spring of 2006 as part of the review for full accreditation status. This visit will result in a formal accreditation recommendation at a meeting of the commission in the fall of 2006.

When ABET or NEASC grants accreditation to an institution, it normally becomes retroactive, applying to degrees conferred in previous years. Initial accreditation begins a cycle of continuous improvement monitored by these external agencies. NEASC will visit Olin at least every ten years. ABET will visit at least every six years.

Policy on Equal Opportunity

In accordance with its own values and with federal and state regulations, Franklin W. Olin College of Engineering does not discriminate on the basis of race, color, creed, national or ethnic origin, gender, religion, disability, age, sexual orientation, disabled veteran status, veteran of the Vietnam Era status, marital or citizenship status (except in those special circumstances permitted or mandated by law). This nondiscrimination policy encompasses the operation of the College's educational programs and activities including admission policies, scholarship program, athletic and other College-administered programs. It also encompasses the employment of College personnel and contracting by the College for goods and services. The College is committed to taking affirmative action to employ and advance in employment qualified women and members of minority groups identified in state and federal Affirmative Action laws and executive orders, persons with disabilities (including qualified special disabled veterans), and veterans of the Vietnam Era. Further, the College pledges to provide all members of its community with a work and academic environment free of intimidation, coercion, unfair treatment or discrimination. The College seeks to create and maintain an environment that is free from inappropriate discrimination including harassment. The College's policy of nondiscrimination is consistent with Title IX of the Educational Amendments of 1972, Title VI of the Civil Rights Act of 1964, Title VII of the Civil Rights Act of 1964, Executive Order 11246, the Equal Pay Act, the Age Discrimination in Employment Act, the Americans with Disabilities Act, Section 504 of the Rehabilitation Act of 1973, Section 503 of the Rehabilitation Act of 1973, Section 402 of the Vietnam Era Veterans Readjustment Assistance Act of 1974, the Immigration Reform and Control Act of 1986, the relevant Governor's Executive Orders, and Chapter 151B of the Massachusetts General Laws. If any member of the College community

feels that he or she has been discriminated against by a student, s/he should contact the Office of Student Life at 781-292-2323 to discuss possible referral of the matter to the Honor Board. If any member of the College community feels that they have been discriminated against by an employee, s/he should contact the Manager of Human Resources at 781-292-2429 to discuss investigation of the matter.

Academic Calendar for 2006–07

As of August 29, 2006. For the most current calendar visit: *http://www.olin.edu/student_life/calendar2006-2007.asp*

July–August	Summer reading *The Tipping Point* by Malcolm Gladwell
August 26(Sa)	Arrival Day for Class of 2010. Residence Halls open at 9:00 a.m. Welcoming luncheon, afternoon program and dinner for new students and parents. Farewell to parents; Orientation begins after dinner
August 27(Su)–30(W)	Orientation: Academic Advising, Team Building and Leadership Skills
August 29(Tu)	Upperclass students begin arriving after 5:00 p.m.
August 31(Th)	First day of instruction, First Semester
September 4(M)	[Labor Day – no classes]
September 17(Su)	Constitution Day
October 5(Th)	Career Initiatives Day – no classes
October 9(M)	[Columbus Day – no classes]
October 10(Tu)	Olin Monday – Monday class schedule in effect
October 13(F)–15(Su)	Family Weekend
October 19(Th)	33rd instructional day
October 29(Su)	Admission Open House
November 1(W)	Major Speaker – 11:00 a.m. to 1:00 p.m.
November 20(M)–24(F)	[Thanksgiving Recess – no classes]
December 12(Tu)	Last day of instruction, First Semester
December 13(W)	Study Day
December 14(Th)–16(Sa)	Final Exams
December 18(M)	Exposition Preparation Day
December 19(Tu)–20(W)	Olin Exposition
December 21(Th)	Residence Halls close at 5:00 p.m. for intersession
December 21(Th)–January 22(M)	[Intersession – no classes]
January 21(Su)	Residence Halls open at 5:00 p.m.
January 23(Tu)	First day of instruction, Second Semester
February 19(M)	[Presidents' Day – no classes]
February 20(Tu)	Olin Monday – Monday class schedule in effect
February 23(F)–24(Sa)	Candidate Weekend I for Class of '11
March 2(F)–3(Sa)	Candidate Weekend II for Class of '11
March 9(F)	33rd instructional day
March 19(M)–23(F)	[Spring Break – no classes]
April 4(W)	Big Conversation Series – no classes
April 16(M)	[Patriot's Day – no classes]
April 19(Th)	Olin Monday – Monday class schedule in effect
May 3(Th)	Last day of instruction, Second Semester
May 4(F)–7(M)	Study Days
May 8(Tu)–11(F)	Final Exams
May 14(M)	Olin EXPO – Underclassmen projects and presentations
May 15(Tu)	Olin EXPO – SCOPE presentations
May 16(W)	Olin EXPO – Arts celebration, presentation of special projects/competitions, Capstone info sessions and advising meetings
May 20(Su)	Commencement for Class of '07
May 21(M)	Residence Halls close at 5:00 p.m.

Student Absence for Religious Observances

Massachusetts state law regarding student absence due to religious beliefs has been adopted by Olin College as follows: "Any student who is unable to attend classes or participate in any examination, study, or work requirement on a particular day because of his or her religious beliefs is excused from any such activity. The student will be given the opportunity to make up the work that was missed, provided that the makeup work does not create an unreasonable burden upon the College. The College will not level fees or charges of any kind when allowing the student to make up missed work. In addition, no adverse or prejudicial effects will result because students have made use of these provisions." The following partial listing is provided for your information:

2006

September 22(sundown)–24	Rosh Hashanah
September 24	Ramadan begins
October 1(sundown)–2	Yom Kippur
October 5(sundown)–7	Sukkot
October 13(sundown)–14	Shmini Atzeret
October 24	Eid-ul-Fitr (Ramadan ends, approximate)
December 8	Immaculate Conception
December 8	Bodhi Day
December 25	Christmas

2007

February 21	Ash Wednesday
March 3(sundown)–4	Purim
April 2(sundown)–10	Passover
April 5	Holy Thursday
April 6	Good Friday
April 8	Easter
May 2	Buddha Day
May 17	Ascension Thursday
May 21(sundown)–23	Shavuot