

Fall 2016 Course Offerings to Satisfy TMC General Education Requirements

MATH/STATS/LOGIC: Mathematics & Adv. Statistics

MATH 4C. Pre-Calculus for Science and Engineering (4)

Review of polynomials. Graphing functions and relations: graphing rational functions, effects of linear changes of coordinates. Circular functions and right triangle trigonometry. Reinforcement of function concept: exponential, logarithmic, and trigonometric functions. Vectors. Conic sections. Polar coordinates. Three lectures, one recitation. (No credit given if taken after MATH 1A/10A or 2A/20A. Two units of credit given if taken after MATH 3C.) **Prerequisites:** *Math Placement Exam qualifying score, or MATH 3C with a grade of C or better.*

MATH 10A. Calculus I (4)

Differentiation and integration of algebraic functions. Fundamental theorem of calculus. Applications. (No credit given if taken after Math. 2A/20A. **Prerequisites:** *Math Placement Exam qualifying score, or AP Calculus AB score of 2, or SAT II MATH 2C score of 600 or higher, or MATH 3C with a grade of C or better, or MATH 4C with a grade of C- or better.*

MATH 10B. Calculus II (4)

Further applications of the definite integral. Calculus of trigonometric, logarithmic, and exponential functions. Complex numbers. (No credit given if taken after Math. 2B/20B.) **Prerequisites:** *AP Calculus AB score of 3, 4, or 5, or Math 10A with a grade of C- or better, or Math 20A with a grade of C- or better.*

MATH 10C. Calculus III (4)

Vector geometry, velocity, and acceleration vectors. (No credit given if taken after MATH 2C/20C.) **Prerequisites:** *AP Calculus BC score of 3, 4, or 5, or MATH 10B with a grade of C- or better, or MATH 20B with a grade of C- or better.*

MATH 20A. Calculus for Science and Engineering (4)

Foundations of differential and integral calculus of one variable. Functions, graphs, continuity, limits, derivative, tangent line. Applications with algebraic, exponential, logarithmic, and trigonometric functions. Introduction to the integral. (Two credits given if taken after MATH 1A/10A and no credit given if taken after MATH 1B/10B or MATH 1C/10C.)

Prerequisites: *Math Placement Exam qualifying score, or AP Calculus AB score of 2 or 3, or SAT II MATH 2C score of 650 or higher, or MATH 4C with a grade of C- or better, or MATH 10A with a grade of C- or better.*

MATH 20B. Calculus for Science and Engineering (4)

Integral calculus of one variable and its applications, with exponential, logarithmic, hyperbolic, and trigonometric functions. Methods of integration. Polar coordinates in the plane. (Two credits given if taken after MATH 1B/10B or MATH 1C/10C.) **Prerequisites:** *AP Calculus AB score of 4, or 5, or AP Calculus BC score of 3, or MATH 20A with a grade of C- or better, or MATH 10B with a grade of C- or better, or MATH 10C with a grade of C- or better.*

MATH 20C. Calculus and Analytic Geometry for Science and Engineering (4)

Vector geometry, vector functions and their derivatives. Partial differentiation. Maxima and minima. Double integration. (Two credits given if taken after MATH 10C.) **Prerequisites:** *AP Calculus BC score of 4, or 5, or MATH 20B with a grade of C-.*

MATH/STATS/LOGIC: Introductory Statistics

COGS 14A. Introduction to Research Methods (4)

Introduction to the scientific method. Methods of knowledge acquisition, research questions, hypotheses, operational definitions, variables, control. Observation, levels of measurement, reliability, validity. Experimentation and design: between-groups, within-subjects, quasi-experimental, factorial, single-subject. Correlational and observational studies. Ethics in research. **Prerequisites:** *none.*

POLI 30D. Political Inquiry (4)

Introduction to the logic of inference in social science and to quantitative analysis in political science and public policy including research design, data collection, data description and computer graphics, and the logic of statistical inference (including linear regression). **Prerequisites:** *none.*

PSYC 60. Introduction to Statistics (4)

This course provides an introduction to both descriptive and inferential statistics, core tools in the process of scientific discovery and the interpretation of research. **Prerequisites:** *none.*

SOCI 60. The Practice of Social Research (4)

Introduction to the fundamental principles of the design of social research. Examine key varieties of evidence, sampling methods, logic of comparison, and causal reasoning researchers use in their study of social issues. *Will not receive credit for SOCI 60 and SOCL 60.* **Prerequisites:** *none.*

MATH/STATS/LOGIC: Computer Programming & Logic

CSE 5A. Introduction to Programming I (4)

Introduction to algorithms and top-down problem solving. Introduction to the C language including functions, arrays, and standard libraries. Basic skills for using a PC graphical user interface operating system environment. File maintenance utilities are covered. (A student may not receive credit for CSE 5A after receiving credit for CSE 10 or CSE 11 or CSE 8B or CSE 9B or CSE 62B or CSE 65.) **Prerequisites:** *A familiarity with high-school level algebra is expected, but this course assumes no prior programming knowledge.*

CSE 8A. Introduction to Computer Science: Java I (4)

Introductory computer science course designed for students interested in computing. No prior programming experience is assumed. Learn fundamental concepts of applied computer science using media computation. Must be taken concurrently with CSE 8AL. CSE 8A is part of a three-track course (CSE 8A, CSE 8AL, and CSE 8B) that is equivalent to CSE 11. Students should take CSE 8B to complete this track. Students who have taken CSE 8B or CSE 11 may not take CSE 8A. Recommended prep: High school algebra and familiarity with computing concept. **Prerequisites:** *co-requisite of CSE 8AL.*

CSE 11. Introduction to Computer Science: Java (4)

Introduction to computer science and programming using the Java language. Basic UNIX. Modularity and abstraction. Documentation, testing and verification techniques. Basic object-oriented programming including inheritance and dynamic bind. Exception handling. Event-driven programming. Experience with AWT library or other similar library. *Recommended: high-school algebra and a course in programming in a compiled language.* **Prerequisites:** *none.*

MATH/STATS/LOGIC: Computer Programming & Logic
<p>MAE 05. Quantitative Computer Skills (4) Introductory course for non-engineering majors. Use of computers in solving problems; applications from life sciences, physical sciences, and engineering. Students run existing computer programs and complete some programming in BASIC. Prerequisites: none.</p> <p>PHIL 10. Introduction to Logic (4) Basic concepts and techniques in both informal and formal logic and reasoning, including a discussion of argument, inference, proof, and common fallacies, and an introduction to the syntax, semantics, and proof method in sentential (propositional) logic. Prerequisites: none.</p> <p>PHIL 12. Scientific Reasoning (4) Strategies of scientific inquiry: how elementary logic, statistical inference, and experimental design are integrated to evaluate hypotheses in the natural and social sciences. Prerequisites: none.</p>
NATURAL SCIENCES: Biology (For Non-Science/Math/Engineering Majors)
<p>ANTH 2. Human Origins (4) An introduction to human evolution from the perspective of physical anthropology, including evolutionary theory and the evolution of the primates, hominids, and modern humans. Emphasis is placed on evidence from fossil remains and behavioral studies of living primates. Prerequisite for upper-division biological anthropology courses. Prerequisites: none.</p> <p>BILD 10. Fundamental Concepts of Modern Biology (4) Introduction to the biochemistry and genetics of cells and organisms; illustrations are drawn from microbiology and human biology. This course is designed for nonbiology students and does not satisfy a lower-division requirement for any biology major. Open to nonbiology majors only. Prerequisites: none.</p> <p>COGS 17. Neurobiology of Cognition (4) Introduction to the organization and functions of the nervous system. Topics include molecular, cellular, developmental, systems, and behavioral neurobiology. Specifically, structure and function of neurons, peripheral and central nervous systems, sensory, motor, and control systems, learning and memory mechanisms. (Students may not receive credit for both BILD 12 and COGS 17). Prerequisites: none.</p>
NATURAL SCIENCES: Chemistry (For Non-Science/Math/Engineering Majors)
<p>CHEM 11. The Periodic Table (4) Introduction to the material world of atoms and small inorganic molecules. Intended for nonscience majors. Students may not receive credit for both CHEM 4 and CHEM 11. Prerequisites: none.</p>
NATURAL SCIENCES: Physics (For Non-Science/Math/Engineering Majors)
<p>PHYS 5. Stars and Black Holes (4) Introduction to the evolution of stars, including birth and death. Topics include constellations, the atom and light, telescopes, stellar birth, stellar evolution, white dwarfs, neutron stars, black holes, and general relativity. Course uses basic algebra, proportion, radians, logs, and powers.</p>

NATURAL SCIENCES: Physics (For Non-Science/Math/Engineering Majors)
<p>PHYS 11. Survey of Physics (4) Survey of physics for non-science majors with strong mathematical background, including calculus. Describes the laws of motion, gravity, energy, momentum, and relativity. Laboratory component consists of two experiments with gravity and conservation principles. Prerequisites: MATH 10A or 20A. Co-requisites: MATH 10B or 20B.</p> <p>PHYS 13. Life in the Universe (4) An exploration of life in the Universe. Topics include defining life; the origin, development, and fundamental characteristics of life on Earth; searches for life elsewhere in the Solar System and other planetary systems; space exploration; and identifying extraterrestrial intelligence. This course uses basic algebra, proportion, radians, logs, and powers.</p> <p>SIO 12. History of the Earth and Evolution (4) Evolution of the Earth from its origin in the early solar system to formation of continents and ocean basins, and how the planet became habitable. It examines the geologic record of evolution, extinction, plate tectonics, and climate changes through time. Prerequisites: none.</p> <p>SIO 15. Natural Disasters (4) Introduction to environmental perils and their impact on everyday life. Geological and meteorological processes, including earthquakes, volcanic activity, large storms, global climate change, mass extinctions throughout Earth's history, and human activity that causes and prevents natural disasters. Prerequisites: none.</p> <p>SIO 30. The Oceans (4) Presents modern ideas and descriptions of the physical, chemical, biological, and geological aspects of oceanography, and considers the interactions between these aspects. Intended for students interested in the oceans, but who do not necessarily intend to become professional scientists. Prerequisites: none.</p> <p>SIO 40. Life and Climate on Earth (4) Explores life on Earth and its relationship to the environment—past, present, and future. Topics include origins of life, earth history, elemental cycles, global climate variability and human impacts on our environment. Prerequisites: none.</p>
NATURAL SCIENCES: Biology (For Science/Math/Engineering Majors)
<p>BILD 1. The Cell (4) An introduction to cellular structure and function, to biological molecules, bioenergetics, to the genetics of both prokaryotic and eukaryotic organisms, and to the elements of molecular biology. Prerequisites: CHEM 6A; CHEM 6B may be taken concurrently.</p> <p>BILD 2. Multicellular Life (4) An introduction to the development and the physiological processes of plants and animals. Included are treatments of reproduction, nutrition, and respiration, and transport systems, regulation of the internal environment, the nervous system, and behavior. Prerequisites: BILD 1.</p>

NATURAL SCIENCES: Biology
(For Science/Math/Engineering Majors)

BILD 3. Organismic and Evolutionary Biology (4)
The first principles of evolutionary theory, classification, ecology, and behavior; a phylogenetic synopsis of the major group of organisms from viruses to primates. **Prerequisites:** none. (Note: EBE majors should complete this course during first year at UC San Diego.)

NATURAL SCIENCES: Chemistry
(For Science/Math/Engineering Majors)

CHEM 4. Basic Chemistry (4)
Offers less-well prepared science majors the fundamental skills necessary to succeed in CHEM 6. Emphasizes quantitative problems. Topics include nomenclature, stoichiometry, basic reactions, bonding, and the periodic table. May not receive credit for both CHEM 4 and CHEM 11. Includes a laboratory/discussion each week. **Recommended:** Concurrent Enrollment in MATH 3C, 4C, 10A or higher.

CHEM 6A. General Chemistry I (4)
First quarter of a three-quarter sequence intended for science and engineering majors. Topics include: atomic theory, bonding, molecular geometry, stoichiometry, types of reactions, and thermochemistry. May not be taken for credit after CHEM 6AH. **Recommended:** proficiency in high school chemistry and/or physics; concurrent or prior enrollment in MATH 10A or 20A.

CHEM 6B. General Chemistry II (4)
First quarter of a three-quarter sequence intended for science and engineering majors. Topics include: atomic theory, bonding, molecular geometry, stoichiometry, types of reactions, and thermochemistry. May not be taken for credit after CHEM 6AH. **Recommended:** proficiency in high school chemistry and/or physics; concurrent or prior enrollment in MATH 10A or 20A.

CHEM 6C. General Chemistry III (4)
Third quarter of a three-quarter sequence intended for science and engineering majors. Topics include: thermodynamics, kinetics, electrochemistry, coordination chemistry, and introductions to nuclear, main group organic, and biochemistry. May not be taken for credit after CHEM 6CH. **Prerequisites:** CHEM 6B or 6BH. **Recommended:** completion of MATH 10B or 20B.

NATURAL SCIENCES: Physics
(For Science/Math/Engineering Majors)

PHYS 1A. Mechanics (3)
First quarter of a three-quarter introductory physics course, geared towards life-science majors. Equilibrium and motion of particles in one and two dimensions in the framework of Newtonian mechanics, force laws (including gravity), energy, momentum, rotational motion, conservation laws, and fluids. Examples will be drawn from astronomy, biology, sports, and current events. **Prerequisites:** MATH 10A or 20A. **Co-requisites:** PHYS 1AL and MATH 10B or 20B (prior completion of mathematics co-requisite is permitted).

PHYS 1AL. Mechanics Laboratory (2)
Physics laboratory course to accompany PHYS 1A. Experiments in Mechanics. **Prerequisites:** MATH 10A or 20A. **Co-requisites:** PHYS 1A and MATH 10B or 20B (prior completion of mathematics co-requisite is permitted).

NATURAL SCIENCES: Physics
(For Science/Math/Engineering Majors)

PHYS 1B. Electricity and Magnetism (3)
Second quarter of a three-quarter introductory physics course geared toward life-science majors. Electric fields, magnetic fields, DC and AC circuitry. **Prerequisites:** PHYS 1A or 2A, 1AL, and MATH 10B or 20B. **Co-requisites:** PHYS 1BL and MATH 10C or 20C or 11 (prior completion of mathematics co-requisite is permitted).

PHYS 1BL. Electricity and Magnetism Laboratory (2)
Physics laboratory course to accompany PHYS 1B. Experiments in electricity and magnetism. Program or material fee may apply. **Prerequisites:** PHYS 1A or 2A, 1AL, and MATH 10B or 20B. **Co-requisites:** PHYS 1B and MATH 10C or 20C or 11 (prior completion of mathematics co-requisite is permitted).

PHYS 1C. Waves, Optics, & Modern Physics (3)
Third quarter of a three-quarter introductory physics course geared toward life-science majors. The physics of oscillations and waves, vibrating strings and sound, the behavior of systems under combined thermal and electric forces, and the interaction of light with matter as illustrated through optics and quantum mechanics. Examples from biology, sports, medicine, and current events. **Prerequisites:** PHYS 1B, 1BL, and MATH 10C or 20C or 11. **Co-requisites:** PHYS 1CL.

PHYS 1CL. Waves, Optics, & Modern Physics Lab. (2)
Physics laboratory course to accompany PHYS 1C. Experiments in waves, optics, and modern physics. Program or material fee may apply. **Prerequisites:** PHYS 1B, 1BL, and MATH 10C or 20C or 11. **Co-requisites:** PHYS 1C.

PHYS 2A. Mechanics (4)
A calculus-based science-engineering general physics course covering vectors, motion in one and two dimensions, Newton's first and second laws, work and energy, conservation of energy, linear momentum, collisions, rotational kinematics, rotational dynamics, equilibrium of rigid bodies, oscillations, gravitation. Students may not earn credit for PHYS 2A and 4A. **Prerequisites:** MATH 20A. **Co-requisites:** MATH 20B (prior completion of mathematics co-requisite is permitted).

PHYS 2B. Electricity and Magnetism (4)
Continuation of PHYS 2A covering charge and matter, the electric field, Gauss's law, electric potential, capacitors and dielectrics, current and resistance, electromotive force and circuits, the magnetic field, Ampere's law, Faraday's law, inductance, electromagnetic oscillations, alternating currents and Maxwell's equations. Students may not earn credit for both PHYS 2B and PHYS 4C. **Prerequisites:** PHYS 2A or 4A and MATH 20B (prior completion of mathematics co-requisite is permitted). **Co-requisites:** MATH 20C.

PHYS 2C. Fluids, Waves, Thermodynamics, & Optics (4)
Continuation of PHYS 2B covering fluid mechanics, waves in elastic media, sound waves, temperature, heat and the first law of thermodynamics, kinetic theory of gases, entropy and the second law of thermodynamics, Maxwell's equations, electromagnetic waves, geometric optics, interference and diffraction. Students may not earn credit for both PHYS 2C and PHYS 4B. **Prerequisites:** PHYS 2A, 2B, and MATH 20C. **Co-requisites:** MATH 20D (prior completion of mathematics co-requisite is permitted).

NATURAL SCIENCES: Physics
(For Science/Math/Engineering Majors)

PHYS 4A. Physics Majors-Mechanics (4)

The first quarter of a five-quarter calculus-based physics sequence for physics majors and students with a serious interest in physics. The topics covered are vectors, particle kinematics and dynamics, work and energy, conservation of energy, conservation of momentum, collisions, rotational kinematics and dynamics, equilibrium of rigid bodies. Students may not earn credit for both PHYS 4A and PHYS 2A.

Prerequisites: MATH 20A. **Co-requisites:** MATH 20B (prior completion of mathematics co-requisite is permitted).

PHYS 4B. Physics Majors-Mechanics, Fluids, Waves, and Heat (4)

Continuation of PHYS 4A covering oscillations, gravity, fluid statics and dynamics, waves in elastic media, sound waves, heat and the first law of thermodynamics, kinetic theory of gases, second law of thermodynamics, gaseous mixtures and chemical reactions. Students may not earn credit for both PHYS 4B and PHYS 2C. **Prerequisites:** PHYS 2A or 4A and MATH 20B. **Co-requisites:** MATH 20C (prior completion of mathematics co-requisite is permitted).

PHYS 4C. Physics Majors-Electricity and Magnetism

Continuation of PHYS 4B covering charge and Coulomb's law, electric field, Gauss's law, electric potential, capacitors and dielectrics, current and resistance, magnetic field, Ampere's law, Faraday's law, inductance, magnetic properties of matter, LRC circuits, Maxwell's equations. Students may not earn credit for both PHYS 4C and PHYS 2B. **Prerequisites:** PHYS 4A, 4B, and MATH 20C. **Co-requisites:** MATH 20E (prior completion of mathematics co-requisite is permitted).

FINE ARTS

MUS 8. American Music (4)

The development of music in America. Focus on both the vernacular traditions including hymn singing, country music, jazz, big band, rock, etc., as well as the cultivated traditions of various composers from William Billings to John Cage.

Prerequisites: none.

MUS 9. Symphony (4)

The symphonic masterworks course will consist of lectures and listening sessions devoted to a detailed discussion of a small number of recognized masterworks. **Prerequisites:** none.

MUS 13. World of Music (4)

Topical course focusing on the music and cultural influences of music across the world. **Prerequisites:** none.

MUS 15. Popular Music (4)

Popular music from different time periods. Topics vary from year to year. **Prerequisites:** none.

MUS 16. The Beatles (4)

Explore The Beatles from musical, cultural, historical, technological, and critical angles. It will place them in context, examining their assorted confluences and wide influences. The group will be critically examined as artists, innovators, and public personalities. Listening, watching, and discussion will provide a broader, deeper, and more personal understanding of the group's enduring appeal. **Prerequisites:** none.

TDGE 1. Introduction to Theatre (4)

An introduction to fundamental concepts in drama and performance. Students will attend performances and learn about how the theatre functions as an art and as an industry in today's world. **Prerequisites:** none.

FINE ARTS

TDGE 11. Great Performances on Film (4)

Course examines major accomplishments in screen acting from the work of actors in films or in film genres.

Prerequisites: none. May be taken three times for credit.

TDHT 21. Ancient and Medieval Theatre (4)

Ancient and medieval theatre. Explores the roots of contemporary theatre in world performance traditions of ancient history with a focus on humans' gravitation toward ritual and play. **Prerequisites:** none.

VIS 1. Introduction to Art Making: Two-Dimensional Practices (4)

An introduction to the concepts and techniques of art making with specific reference to the artists and issues of the twentieth century. Lectures and studio classes will examine the nature of images in relation to various themes. Drawing, painting, found objects, and texts will be employed.

Prerequisites: none. This course is offered only once per year.

VIS 20. Introduction to Art History (4)

This course examines history of Western art and architecture through such defining issues as the respective roles of tradition and innovation in the production and appreciation of art; the relation of art to its broader intellectual and historical contexts; and the changing concepts of the monument, the artist, meaning, style, and "art" itself. Representative examples will be selected from different periods, ranging from Antiquity to Modern. Content will vary with the instructor.

Prerequisites: none.

VIS 84. History of Film (4)

A survey of the history and the art of the cinema. The course will stress the origins of cinema and the contributions of the earliest filmmakers, including those of Europe, Russia, and the United States. **Prerequisites:** none. Materials fee required. This course is offered only one time each year.

HUMANITIES/CULTURE

ETHN 1. Introduction to Ethnic Studies: Land & Labor(4)

This course examines key historical events and debates in the field that center around land and labor, including disputes about territory and natural resources, slavery and other forms of unfree labor, labor migration and recruitment, and US and transnational borders. **Prerequisites:** none.

HILD 7A. Race and Ethnicity in the United States (4)

A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be the African American, slavery, race, oppression, mass migrations, and ethnicity, city life in industrial America, and power and protest in modern America. **Prerequisites:** none.

HILD 10. East Asia: The Great Tradition (4)

The evolution of East Asian civilization from the first writing through classical Hei'an Japan and late imperial Song China. Primary and secondary readings on basic ideas, institutions and practices of the Confucian, Daoist, and Buddhist paths and of the state and family. **Prerequisites:** none.

LLEN 28. Introduction to Asian American Literature (4)

This course provides an introduction to the study of the history, communities, and cultures of different Asian American people in the United States. Students will examine different articulations, genres, conflicts, narrative forms, and characterizations of the varied Asian experience.

TWS 26. Third World Literatures (4)

An introduction to the cultures of various Third World countries through close reading of selected literary texts.