ARTS 117A Advanced Digital Imaging Software (Photoshop) 3 Units
Prerequisite: Computer Applications and Office Systems 112A, or Arts 112A, or CAD and Digital Imaging 112A.
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or English as a Second Language 261, 262 and 263; Computer Applications and Office Systems 900A.
(Also listed as CAD and Digital Imaging 117A and Computer Applications and Office Systems 117A. Student may enroll in only one department for credit.) Six hours lecture-laboratory.

Pass-No Pass (P-NP) course.
Advanced principles and techniques of using digital imaging software to produce graphics for Web sites and printed media. Integration of digital imaging software with Web authoring software. This course is for the content person wishing to produce digital images for Web pages and print media.

ARTS 118A Advanced Web Graphics/Animation Software (Flash) 3 Units
Prerequisite: Computer Applications and Office Systems 114A, or Arts 114A, or CAD and Digital Imaging 114A.
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or English as a Second Language 261, 262 and 263; Computer Applications and Office Systems 900A.
(Also listed as CAD and Digital Imaging 118A and Computer Applications and Office Systems 118A. Student may enroll in only one department for credit.) Six hours lecture-laboratory.
Pass-No Pass (P-NP) course.
An advanced Flash course that is projects and portfolio based and taught from a designer perspective. Students will be taught how to build a portfolio and an multimedia presentation. Basic programming skills will be taught along with developing interactive Web-based multimedia presentations using ActionScripts, sound and graphics.

Astronomy

ASTR 4 Solar System Astronomy 5 Units
(See general education pages for the requirement this course meets.)
Advisory: English Writing 1A or English as a Second Language 5.
Five hours lecture.
Analyze the physical principles, logic, and development of solar system astronomy from ancient times through the present. Examine earth and sky relationships, exploration of the solar system by spacecraft and earth-based methods, similarities and differences between Earth and other planets, theories of the origin of our planetary system, and properties of other stars' planetary systems. Includes multimedia planetarium demonstrations.

ASTR 10 Stellar Astronomy 5 Units
(See general education pages for the requirement this course meets.)
Advisory: English Writing 1A or English as a Second Language 5.
Five hours lecture.
Analyze the physical principles, logic, and development of stellar astronomy from ancient times through the present, with emphasis on recent developments. Examine the relationship of Earth to its deep-space environment and contrast the Sun to other types of stars. Synthesize the organization in space and time of the hierarchy of the cosmos from stellar systems through the universe on its largest observable scale and investigate the observational strategies and equipment that are used to investigate it.

ASTR 77 Special Projects in Astronomy 1 Unit
Prerequisite: Consent of instructor and division dean.
Three hours laboratory per week for each unit of credit.
(Any combination of Astronomy 77, 77X and 77Y may be taken up to six times, not to exceed 18 units, as long as the projects are different each term.)
Pass-No Pass (P-NP) course.
Individual research in Astronomy. Specific projects to be determined on consultation with the instructor. Outside reading and written report(s) required. These projects are on topics not covered in the regular Astronomy curriculum and require the approval of the PSM&E Division Dean.

Automotive Technology

AUTO 50A Introduction to Automotive Principles 4 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Four hours lecture per week (equal to forty-eight hours lecture per quarter). A selective study of the automobile's engine systems. Knowledge and skills necessary for basic repair, maintenance, and troubleshooting of today's engine systems. May be used to fulfill the prerequisite to the Automotive Technology Program.

AUTO 50B Applied Automotive Principles 2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent; Automotive Technology 50A (may be taken concurrently).
Four hours lecture-laboratory per week (equal to forty-eight hours lecture-laboratory per quarter).
Basic lecture-laboratory experiences in automotive repair and maintenance as related to the engine and its supporting systems.

AUTO 51A Introduction to Automotive Principles - Chassis Systems 4 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent. Automotive Technology 51A (may be taken concurrently).
Four hours lecture-laboratory per week (equal to forty-eight hours lecture-laboratory per quarter).
A selective study of the automobile's chassis and drive line systems. Knowledge and skills necessary for basic repair, maintenance, and troubleshooting of today's chassis and drive line systems. Can be used to fulfill the prerequisite to the Automotive Technology Program.

AUTO 51B Applications of Automotive Principles (Chassis Systems) 2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent; Automotive Technology 51A (may be taken concurrently).
Four hours lecture-laboratory per week (equal to forty-eight hours lecture-laboratory per quarter).
Basic lecture-laboratory experiences in automotive repair and maintenance as related to: suspension, steering, braking and drive line components.

AUTO 53A Automotive Mechanisms 3 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Six hours lecture-laboratory per week (equal to seventy-two hours lecture-laboratory per quarter).
The application of physical principles to the operation of mechanical, hydraulic, and hydromechanical systems, using an applied physics technique.

AUTO 53B Automotive Electromechanical Systems 2 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Electrical theories, testing and measuring procedures, circuit construction and schematic interpretation. Application of the principles of magnetism. Fundamentals of operation of semiconductors used as electronic devices and controls.

AUTO 57A Career Research and Employment in the Automotive Industry 2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273.
Two hours lecture per week (equal to twenty-four hours lecture per quarter).
Career research in the automotive industry: job search, applications and resumes, employer-employee relationships, job interviews.

AUTO 58 Hazardous Materials 1/2 Unit
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
One-half hour lecture per week (equal to six hours lecture per quarter).
Proper handling of hazardous materials in the automotive trade.

AUTO 60 Automotive Electrical Systems 9 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent; Automotive Technology 50A and 50B.
Nine hours lecture per week (equal to one-hundred-eight hours lecture per quarter).
Principles of electricity, electronics, cranking, and charging systems. Testing, diagnosis and repair of these systems.

AUTO 60A Electrical Schematic Diagnosis 4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent; Automotive Technology 60.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Theory of operation for electrical, electronic, and electromechanical accessory systems. Understanding and using wiring diagrams, schematics, and other diagnostic information to troubleshoot electrical, electronic, and electromechanical systems. Preparation for Automotive Service Excellence (ASE) examination in areas A6, A8, and L1.
AUTO 60B  Automotive Electronics  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A, 50B, 60, and 60A.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Application of computer control principles to automotive systems. Operation of
automotive electronic control systems, including commonly used sensors, actuators,
and displays. Introduction to diagnostic methods and test equipment for automotive
control systems. Preparation for Automotive Service Excellence (ASE) examination
in areas A6, A8, and L1.

AUTO 60C  Automotive Ignition, Fuel, and Emission Systems  9 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A, 50B, 60, 60A and 60B.
Nine hours lecture per week (equal to one-hundred-eight hours lecture per quarter).
Introduction to components, subsystems, and functions of ignition, fuel delivery,
carburetor and fuel injection systems (engine management). Introduction to
automotive emission controls. Basic diagnosis, service, and repair procedures.
Preparation for Automotive Service Excellence (ASE) examination in areas A6, A8, and L1.

AUTO 60D  Ignition Analysis and Oscilloscope Diagnosis  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A, 50B, 60, 60A and 60C.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Ignition system principles of operation and diagnosis. Use of electronic test
equipment in ignition system diagnosis. Preparation for Automotive Service Excellence (ASE) certification examinations in Areas A6, A8, and L1.

AUTO 60E  Automotive Fuel Injection  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A, 50B, 60, 60A, 60B and 60C.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Theory of operation and service of electronic fuel injection systems. Component
parts and their functions and overall system theory. Diagnostic and repair methods
using standard test and repair equipment. Preparation for Automotive Service Excellence (ASE) examination in Areas A6, A8, and L1.

AUTO 60F  No-Start Diagnosis  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A, 50B, 60, 60A, 60B, 60C, 60D and 60E.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Principles of troubleshooting procedures and techniques to analyze and repair of
"no start" problems in the fuel, ignition, and electrical systems of an automobile.
Preparation for Automotive Service Excellence (ASE) examination in Areas A6, A8, and L1.

AUTO 60G  Advanced Scan Tool Diagnosis  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A, 50B, 60, 60A, 60B, 60C, 60D and 60E.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Advanced drivability diagnosis using a scan tool. Using the onboard diagnostic
capabilities of vehicles built since 1980. Advanced scan data analysis. Using PC
capabilities to store and analyze diagnostic information. Preparation for Automotive Service Excellence (ASE) examination in Areas A6, A8, and L1.

AUTO 60H  Advanced Drivability and Onboard Diagnostics  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A, 50B, 60, 60A, 60B, 60C, 60D and 60E.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Survey of onboard diagnostic systems from 1980 to the present. Advanced electronic
diagnostic procedures using an automotive scan tool. Preparation for Automotive Service Excellence (ASE) examination in Areas A6, A8, and L1.

AUTO 60J  Advanced Lab Scope and Waveform Diagnosis  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A, 50B, 60, 60C, 60D, 60E and 60G.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Diagnosis of automotive electronic systems using a laboratory oscilloscope and a
power graphing meter. Related use of other basic test equipment, including a digital

AUTO 60K  Advanced Body Electrical, Theory, and Waveform Diagnosis  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 60A, 60B and 60G.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Theory of operation for body electrical, electronic, and electromechanical systems.
Understanding the functions of automotive body electrical systems. Utilization
of special diagnostic equipment for body electrical systems and subsystems.
Appropriate repair protocol for applied body electrical systems. Symptoms
to system diagnosis. Preparation for Automotive Service Excellence (ASE) examination
in area A6.

AUTO 60M  Hybrid Electric Vehicles  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 60A, 60B and 60G.
Two hours lecture per week (equal to twenty-four hours lecture per quarter).
Understanding the functions of automotive hybrid propulsion systems. Operating
characteristics of hybrid drive systems. Integration of high voltage power supplies
and energy storage systems. Operating fundamentals of DC to DC converters.
Relationship of internal combustion engines and motor generators. Function
and design of regenerative braking systems. Operation of hybrid transmission
systems and power splitting devices. Application of the high expansion ratio cycle.
Understanding safety aspects of service hybrid electric vehicles. Utilization
of special diagnostic equipment for hybrid electrical systems and related subsystems.
Appropriate repair protocol for hybrid electrical systems. Maintenance and servicing
of Hybrid vehicles.

AUTO 60N  Hybrid Vehicle Safety and Maintenance  2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 210 or 212 or equivalent;
Automotive Technology 60A and 60B.
Two hours lecture per week (equal to twenty-four hours lecture per quarter).
Explores the use of hybrid electric power for vehicle transportation. Topics will
include: safety, maintenance of hybrid propulsion and internal combustion systems,
drivability, and storage battery technology. Various designs of hybrid vehicles
and their integrated systems from multiple manufacturers will be discussed. This course
also fulfills the Toyota Technician Education Network training requirement for the
T-256 course. This course is suitable for students interested in alternative fuels or
power and energy technology.

AUTO 61A  Automotive Brake Systems  4 1/2 Units
(Formerly Automotive Technology 61.)
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 60A and 60G.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Operation of automotive brake systems. Repair, maintenance and troubleshooting.

AUTO 61B  Electronically Controlled Brake Systems  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 62A.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per quarter).
Computer controlled automotive brake systems, including service, maintenance,
troubleshooting and repair procedures.

AUTO 62A  Automotive Suspension, Steering, and Alignment  9 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A and 50B.
Nine hours lecture per week (equal to one-hundred-eight hours lecture per quarter).
Operation of automotive suspension, steering and alignment systems. Overview
of maintenance, repair and troubleshooting procedures.

All courses are for unit credit and apply to a
De Anza associate's degree unless otherwise noted.
AUTO 62B  Advanced Wheel Alignment  9 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 62A.
Four and one-half hours lecture per week (equal to forty-four hours lecture per
quarter).
Advanced study of wheel alignment systems. Emphasis is placed on diagnostic
inspection and repair procedures.

AUTO 63  Automatic Transmissions and Transaxles  9 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A and 50B.
Nine hours lecture per week (equal to one-hundred-eight hours lecture per
quarter).
Principles of operation, service and repair procedures for automatic transmissions
and transaxles. Hydraulic and mechanical system operation. Power flow and
component repair techniques. Preparation for Automotive Service Excellence
(ASE) certification examination A3.

AUTO 63A  Automotive Drive Train  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A and 50B.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per
quarter).
Principles of operation of automotive drive train components. Service and repair
procedures, product problem discussions and demonstrations. Preparation for
Automotive Service Excellence (ASE) certification examination A3.

AUTO 63B  Automatic Transmission  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A and 50B.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per
quarter).
Principles of operation, service and repair procedures of automatic transmissions.
Hydraulic and mechanical system operation. Preparation for Automotive Service
Excellence (ASE) certification examination A2.

AUTO 63C  Automotive Transaxles  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A and 50B.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per
quarter).
Automotive transaxle operation. Theory of operation, service and repair
techniques as related to automatic transaxles. Power flow and component repair
techniques. Preparation for Automotive Service Excellence (ASE) certification
examination A2.

AUTO 63D  Transmission Diagnostic and Repair Techniques  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A and 50B.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per
quarter).
Diagnostic and repair techniques for automatic transmissions and transaxles.
Emphasis on development of diagnostic procedures and repair techniques.
Preparation for Automotive Service Excellence (ASE) certification examinations
A2 and A3.

AUTO 64  Automotive Machining and Engine Repair  9 Units
(Formerly Automotive Technology 64A and 64B.)
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A and 50B.
Nine hours lecture per week (equal to one-hundred-eight hours lecture per
quarter).
Repair and rebuilding of engine cylinder heads and block components, engine
assembly and testing, includes theory, diagnosis, disassembly, cleaning, inspection
and failure analysis. Preparation for Automotive Service Excellence (ASE)
examinations for areas A1 and M1, M2, and M3.

AUTO 64HP  High Performance Engine Preparation  9 Units
Prerequisite: Automotive Technology 64; or Automotive Technology 64A and
64BAdvisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A and 50B.
Nine hours lecture per week (equal to one-hundred-eight hours lecture per
quarter).
Precision and performance engine preparation. Includes selection and matching of
engine and valve train components for maximum efficiency and output.

AUTO 65P  Clean Air Car Course  7 Units
Prerequisite: Automotive Technology 60, 60B, and 60E, and one year of related
automotive experience.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
See course details (four hours lecture per week).
Automotive technician training program for California’s Inspection and Maintenance
Program (I&M Program). Course content is mandated by the BAR.

AUTO 65R  California ASE Alternative Training A6  2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 60, 60A and 60B.
Two hours lecture per week (equal to twenty-four hours lecture per quarter).
Review of On-board Diagnostics Generation I (OBDI). Extensive coverage of On-
board Diagnostics Generation II (OBDII) operating system, testing procedures
and strategies. Preparation for Automotive Service Excellence (ASE) examination
in areas A6, A8, L1, and Inspection and Maintenance (I/M) technician update
requirements.

AUTO 65S  California ASE Alternative Training A8  2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 60, 60A, 60B and 60C.
Two hours lecture per week (equal to twenty-four hours lecture per quarter).
An approved course by the Bureau of Automotive Repair (BAR) as an alternative
to meet the ASE A8 certification prerequisites for obtaining a smog technician
license.

AUTO 65V  California ASE Alternative Training L1  2 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Service Excellence (ASE) Certification A6 and A8.
Two and one-half hours lecture per week (equal to thirty hours lecture per
quarter).
Approved by the Bureau of Automotive Repair (BAR) as an alternative to meet
the ASE L1 certification prerequisites for obtaining a smog technician license.

AUTO 65W  Advanced Clean Air Car Course  2 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 60.
Two and one-half hours lecture per week (equal to thirty hours lecture per
quarter).
Preparation for Automotive Service Excellence (ASE) certification in
areas: A6, A8, L1, and Maintenance (I/M) technician update.

AUTO 66  Automotive Air Conditioning  4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 60.
Four and one-half hours lecture per week (equal to fifty-four hours lecture per
quarter).
Operation and service of automotive air conditioning refrigeration and electrical
control systems. Includes retrofitting. Emphasis on diagnosis and repair of systems.
Preparation for Automotive Service Excellence (ASE) certification examination
in area A7.

AUTO 69X  Smog Check Update  1 Unit

AUTO 69Y  1 1/2 Units

AUTO 69Z  2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
current CA Smog Check License.

One hour lecture for each unit of credit.
(Any combination of Automotive Technology 69X, 69Y and 69Z may be taken up
to six times for credit.)
A legally mandated course required by the California Bureau of Automotive Repair
(BAR) to obtain a renewal Smog Check License every two years. This applies to
all State Licensed Smog Check Technicians. The latest Smog Check Program
changes and updates will be covered. The State Smog Check License renewal
examination will be given at the end of the course. The unit value of the course
will depend on the curriculum and hours of instruction specified by BAR for
the current two year cycle.

AUTO 91A  Automotive Brake Systems  5 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211),
or English as a Second Language 272 and 273; Mathematics 212 or equivalent;
Automotive Technology 50A and 50B.
Ten hours lecture-laboratory.
Repair, maintenance and troubleshooting of automotive braking systems.
AUTO 92A  Automatic Steering and Suspension   5 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract; Automotive Technology 92A.
Three hours lecture-laboratory.
Repair, maintenance and troubleshooting of suspension and steering systems.

AUTO 92B  Automotive Alignment  5 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract; Automotive Technology 92A.
Ten hours lecture-laboratory.
Automotive alignment systems, including repair, maintenance and troubleshooting. Service and repair procedures.

AUTO 92C  Automotive Electronic Chassis Controls   1 1/2 Units
Prerequisite: Approved Automotive Course Sequence Contract; Automotive Technology 92B.
Three hours lecture-laboratory.
Computer controlled automotive suspension and steering systems, including repair, maintenance, troubleshooting, and service procedures.

AUTO 92D  Uni-Body Alignment  1 1/2 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract; Automotive Technology 92C.
Three hours lecture-laboratory.
Gaging, analyzing, repairing and alignment of uni-body systems.

AUTO 93A  Automotive Final Drive Train   5 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Ten hours lecture-laboratory per week (equal to one-hundred-twenty hours lecture-laboratory per quarter).
Components of the final drive train including design features and service techniques.

AUTO 93B  Standard Transaxles  1 1/2 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Standard transaxles: power flow, service requirements and repair procedures.

AUTO 93C  Automatic Transmissions  5 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Ten hours lecture-laboratory per week (equal to one-hundred-twenty hours lecture-laboratory per quarter).
Operation of automatic transmissions including torque converters, hydraulic control, planetary gear train, clutch and band operation. Inspection and repair procedures for automatic transmissions.

AUTO 93D  Automatic Transaxles  1 1/2 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Three hours lecture-laboratory per week (equal to thirty-six hours lecture-laboratory per quarter).
A detailed study of automatic transaxles. Power flow, service requirements and repair procedures will be covered.

AUTO 93E  Diagnostic Techniques  1 Unit
Prerequisite: Approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Two hours lecture-laboratory per week (equal to twenty-four hours lecture-laboratory per quarter).
Diagnostic techniques for problem solving in the automotive and light duty truck powertrain.

AUTO 93F  Automotive Transmission Service   5 Units
Prerequisite: Approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Ten hours lecture-laboratory per week (equal to one-hundred-twenty hours lecture-laboratory per quarter).
Operation of rear axles, transfer cases, clutches, automatic and standard transmissions and transaxles. Diagnostic, inspection and repair procedures for these powertrain components.

AUTO 94A  Principles of Four Stroke Cycle Gas and Diesel Engines  5 Units
Prerequisite: Automotive Technology 50B; approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Ten hours lecture-laboratory per week (equal to one-hundred-twenty hours lecture-laboratory per quarter).
Shop operations specific to engine repair and rebuilding including safety and hazardous waste management. Emphasis on theory, diagnosis, disassembly, cleaning, inspection and failure analysis.

AUTO 94B  Automotive Machining and Engine Service  5 Units
Prerequisite: Automotive Technology 94A; approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Ten hours lecture-laboratory per week (equal to one-hundred-twenty hours lecture-laboratory per quarter).
Reconditioning cylinder heads and related valve train components including crack detection, repair, testing and assembly. Resurfacing cylinder heads.

AUTO 94C  Automotive Machining and Engine Service  5 Units
Prerequisite: Automotive Technology 94B; approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Ten hours lecture-laboratory per week (equal to one-hundred-twenty hours lecture-laboratory per quarter).
Reconditioning engine short block assemblies and components including balancing, assembly and testing.

AUTO 94D  Automotive Machining and Engine Service  5 Units
Prerequisite: Automotive Technology 94C; approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Ten hours lecture-laboratory per week (equal to one-hundred-twenty hours lecture-laboratory per quarter).
Precision and performance engine preparation with emphasis on improvements in volumetric efficiency. Includes selection and matching of components for maximum efficiency within mandated emissions requirements.

AUTO 94E  Automotive Machining and Engine Service  5 Units
(Formerly Automotive Technology 94EA.)
Prerequisite: Automotive Technology 94D.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Ten hours lecture-laboratory per week (equal to one-hundred-twenty hours lecture-laboratory per quarter).
Complete automotive machine shop practice including engine repair, assembly, testing, and installation. Researching service and installation procedures and parts and labor estimating.

AUTO 94F  Automotive Machining and Engine Service  5 Units
(Formerly Automotive Technology 94EB.)
Prerequisite: Automotive Technology 94E.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Ten hours lecture-laboratory per week (equal to one-hundred-twenty hours lecture-laboratory per quarter).
Practice and skill development with emphasis on precision and productivity in rebuilding, servicing, and installing engines. Research and prepare equipment operation and maintenance instructions.
AUTO 99A Automotive Electricity, Battery, and Cranking Systems 6 1/4 Units
Prerequisite: Automotive Technology 50B; approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Twelve and one-half hours lecture-laboratory per week (equal to one-hundred-fifty hours lecture-laboratory per quarter).
(May be taken up to three times for credit.)
Automotive electricity including the electron theory, fundamentals of circuit construction, introduction, principles of magnetism as applied to electric motors, relays and coils. Diagnosis, troubleshooting and servicing of automotive battery and cranking systems including system repair procedures. Developing skills in the use of test equipment including the DVOM and electrical load testing tools for the analysis and diagnosis of these types of electrical systems.

AUTO 99B Automotive Charging, Ignition, and Accessory Systems 6 1/4 Units
Prerequisite: Automotive Technology 99A; approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Twelve and one-half hours lecture-laboratory per week (equal to one-hundred-fifty hours lecture-laboratory per quarter).
(May be taken up to three times for credit.)
The fundamentals of automotive electronic devices as they apply to the automotive charging and ignition systems. Emphasis on diagnosis of these systems using test instruments including the oscilloscope. Introduction to automotive accessory systems including wiring and repair techniques. Skill development in the understanding of the electrical wiring diagram networks as provided by manufacturers.

AUTO 99C Introduction to Engine Performance Systems 6 1/4 Units
Prerequisite: Automotive Technology 99B; approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Twelve and one-half hours lecture-laboratory per week (equal to one-hundred-fifty hours lecture-laboratory per quarter).
(May be taken up to three times for credit.)
Electronically controlled automotive systems. Fundamentals of automotive microprocessors and automotive onboard computers. Testing techniques for system input and output devices. Diagnosis, troubleshooting, and repairing the automotive fuel supply system including carburetion and feedback carburetion, Diagnosis, troubleshooting, and repair techniques for no-start conditions. Procedure development for analyzing and repairing common problems of fuel, ignition, electrical and basic engine mechanical systems which effect engine performance of the automobile.

AUTO 99D Intermediate Engine Performance Systems 6 1/4 Units
Prerequisite: Automotive Technology 99C; approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Twelve and one-half hours lecture-laboratory per week (equal to one-hundred-fifty hours lecture-laboratory per quarter).
(May be taken up to three times for credit.)
Electronically controlled engine performance systems. Diagnosis, troubleshooting, and repairing the automotive fuel-injection systems of domestic automobiles. Testing techniques for system input and output devices using automotive scanners and oscilloscopes.

AUTO 99E Basic Engine Performance Diagnostic Procedures 6 1/4 Units
Prerequisite: Automotive Technology 99D; approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Twelve and one-half hours lecture-laboratory per week (equal to one-hundred-fifty hours lecture-laboratory per quarter).
(May be taken up to three times for credit.)
Automotive technician training program to include each system which aids in increasing fuel economy and in the reduction of emissions and pollutants from the automobile. Diagnosis and troubleshooting the systems controlling automotive performance and drivability.

AUTO 99F Intermediate Engine Performance Diagnostic Procedures 6 1/4 Units
Prerequisite: Automotive Technology 99E; approved Automotive Technology Course Sequence Contract.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 212 or equivalent.
Twelve and one-half hours lecture-laboratory per week (equal to one-hundred-fifty hours lecture-laboratory per quarter).
(May be taken up to three times for credit.)
Performance tuning of automotive gasoline engines. Emphasis on reference material dealing with repair procedures, specifications, and efficient tune-up procedures. Intermediate level for usage of computer scanners and oscilloscopes. Diagnosing, troubleshooting, and repairing the systems designed for the control of engine temperature.

Biology

BIOL 5 Biology of Birds 5 Units
(See general education pages for the requirement this course meets)
Advisory: English Writing 1A or English as a Second Language 5.
Four hours lecture, three hours laboratory.
A general introduction to the biology of birds, including anatomy, physiology, ecology, evolution, behavior, diversity, identification, conservation, and relationships between birds and people around the world.(Includes Saturday field trips.)

BIOL 6A Form and Function in the Biological World 6 Units
(See general education pages for the requirement this course meets.)
Prerequisite: A satisfactory score on the Chemistry Placement Exam or a grade of C or better in either Chemistry 1A or 50.
Advisory: English Writing 1A or English as a Second Language 5.
Four hours lecture, six hours laboratory.
Introduction to biology and scientific methods for students beginning the biology major series. Study of the structure and physiological processes of living organisms, with an emphasis on plants and animals.

BIOL 6B Cell and Molecular Biology 6 Units
Prerequisite: Biology 6A.
Advisory: English Writing 1A or English as a Second Language 5; Mathematics 114 or equivalent.
Four hours lecture, six hours laboratory.
Introduction to cellular structure and function, biological molecules, bioenergetics, molecular genetics, and cell proliferation. The laboratory includes extensive hands-on experimentation in molecular biology.

BIOL 6C Ecology and Evolution 6 Units
Prerequisite: Biology 6B.
Advisory: English Writing 1A or English as a Second Language 5; Mathematics 114 or equivalent.
Four hours lecture, six hours laboratory.
Principles of ecology and evolution. Includes ecology of populations, communities, ecosystems and biomes as well as evolution of populations, and the origin of species and higher taxa. The laboratory portion of the course includes a research project designed, researched and presented by students.

BIOL 8 Biology of Women 4 Units
(See general education pages for the requirement this course meets.)
Advisory: English Writing 1A or English as a Second Language 5.
Four hours lecture.
Designed for non-science majors to explore women's anatomical and physiological characteristics and their management for good health. The emphasis is on the biological processes and principles organizing a “typical” female life progression, with a secondary focus on the structural and functional dimorphism of human body systems. It also aims at recognizing components of the scientific process distorted in the historical view of women and the impact that societal and cultural biases have on behavior and on female health issues.

BIOL 10 Introductory Biology 5 Units
(Not open to students who have completed Biology 6A, 6B, 6C, or equivalent.)
(See general education pages for the requirement this course meets.)
Advisory: English Writing 1A or English as a Second Language 5.
Four hours lecture, three hours laboratory.
An introduction to biology as a branch of the biological sciences and to its basic unifying principles, with selected application to the scientific method, evolutionary concepts, genetic modification, biotechnology, ecology, ecological crises and human impacts.
B

BIO 11  Human Biology  5 Units
(Not open to students who have completed Biology 6A, 6B or 6C, or equivalent; or Biology 40A, 40B or 40C, or equivalent.)
(See general education pages for the requirement this course meets.)
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273.
Four hours lecture, three hours laboratory.
A general introduction to biology and its principles, emphasizing the biology of humans. The course will cover the unitifying principles of biology, with emphasis on the basic anatomy and physiology of the human body, as well as on contemporary health issues and their impacts on cultural, ethnic and gender groups.

BIO 13  Marine Biology  5 Units
(See general education pages for the requirement this course meets.)
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273.
Four hours lecture, four hours laboratory.
Introduction to physical and chemical oceanography, marine animals, marine plants, and marine ecology with major emphasis on natural history of marine life. Bays, estuaries and open oceans are described as habitats. Marine biology as a branch of the biological sciences, employs the scientific method.

BIO 15  California Ecology  5 Units
(See general education pages for the requirement this course meets.)
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273.
Four hours lecture, three hours laboratory.
An introduction to ecology and field biology as a branch of the biological sciences and its relationship to the scientific method. A review of plant and animal adaptations to the natural environments and the impact of pollution, degradation of habitat, and human population on life.

BIO 26  Introductory Microbiology  6 Units
Prerequisite: Biology 40A, 40B and 40C, or equivalent, with a grade of C or better.
Four hours lecture, six hours laboratory.
Introduction to the sciences and the scientific method as exemplified by the study of microbiology. Morphology, growth and genetics of bacteria and other microorganisms; chemical and physical means of control; the disease process and immunity. The importance of microorganisms to mankind; techniques and methods of microbiology.

BIO 40A  Human Anatomy and Physiology  5 Units
Prerequisite: Satisfactory score on the Biology 40A Placement Test or Chemistry 1A or Chemistry 30A with a grade of C or better.
Advisory: English Writing 1A or English as a Second Language 5.
Four hours lecture, three hours laboratory.
An introduction to the disciplines of anatomy and physiology. Basic principles of human anatomy and physiology as exemplified in the study of cell chemistry, cell biology, histology and the integumentary, skeletal and muscular systems with emphasis on homeostatic mechanisms.

BIO 40B  Human Anatomy and Physiology  5 Units
Prerequisite: Biology 40A with a grade of C or better.
Four hours lecture, three hours laboratory.
Study of the nervous, circulatory, and respiratory systems.

BIO 40C  Human Anatomy and Physiology  5 Units
Prerequisite: Biology 40B with a grade of C or better.
Four hours lecture, three hours laboratory.
Study of the endocrine system, lymphatic system, digestive system, metabolism, urinary and reproductive systems, embryological development and classical Mendelian and modern biochemical genetics including genetic engineering.

BIO 45  Introduction to Human Nutrition  4 Units
Prerequisite: Biology 40C.
Advisory: English Writing 1A or English as a Second Language 5.
Four hours lecture.
The chemical classification of nutrients, their functions within the human body, and the effects of nutritional deficiencies and excesses. The relationship of dietary intakes to health and disease.

BIO 54G  Applied Human Anatomy and Physiology: Levels of Organization  1 1/2 Units
(Not open to students with credit in Biology 6A, 6B or 6C; or 40A, 40B or 40C; or equivalent.)
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or English as a Second Language 261, 262 and 263.
One hour lecture, one and one-half hours laboratory.
Survey of human anatomy and physiology with emphasis on homeostatic limits of the human body. The skeletal, muscular and nervous systems including somatic and special senses. (Especially designed for students planning careers in medical assisting. Licensed Vocational Nursing, education, speech, home economics, psychology, physical education and/or recreation.)

BIO 54H  Applied Human Anatomy and Physiology: Support, Movement, and Integration  1 1/2 Units
(Not open to students with credit in Biology 6A, 6B or 6C; or 40A, 40B or 40C; or equivalent.)
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or English as a Second Language 261, 262 and 263.
One hour lecture, one and one-half hours laboratory.
Survey of human anatomy and physiology with emphasis on homeostatic limits of the human body. The skeletal, muscular and nervous systems including somatic and special senses. (Especially designed for students planning careers in medical assisting. Licensed Vocational Nursing, education, speech, home economics, psychology, physical education and/or recreation.)

BIO 54J  Applied Human Anatomy and Physiology: Absorption, Excretion, and Reproduction  1 1/2 Units
(Not open to students with credit in Biology 6A, 6B or 6C; or 40A, 40B or 40C; or equivalent.)
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or English as a Second Language 261, 262 and 263.
One hour lecture, one and one-half hours laboratory.
Survey of human anatomy and physiology with emphasis on homeostatic limits of the human body. The endocrine, cardiovascular, and lymphatic systems and the blood. (Especially designed for students planning careers in medical assisting. Licensed Vocational Nursing, education, speech, home economics, psychology, physical education and/or recreation.)

BIO 77  Special Projects in Biology  1 Unit
BIOL 77X  2 Units
BIOL 77Y  3 Units
(Formerly Biology 49, 49X and 49Y respectively.)
Prerequisite: Consent of instructor and division dean.
Three hours laboratory for each unit of credit.
(Any combination of Biology 77, 77X and 77Y may be taken up to six times, not to exceed 18 units, as long as the projects are different each time.)
Individual research in the biological sciences. Specific projects determined on consultation with the instructor. Outside reading and written report required.

BIO 150  Biology Skills Laboratory  1/2 Unit
BIOL 150W  1 Unit
BIOL 150X  1 Unit
BIOL 150Y  1/2 Unit
BIOL 2 Units
Corequisite: Students enrolled in Biology 150, 150W, 150X or 150Y must also enroll in any Biology Department course (includes Health and Nutrition courses).
Three hours laboratory for each unit of credit.
(Any combination of Biology 150, 150W, 150X and 150Y may be taken up to six times for credit.)
Pass-No Pass (P-NP) course.
An open entry/open exit optional supplemental learning course for Biology Department students who are enrolled in a Biology, Health, and/or Nutrition parent course, which will strengthen student skills and reinforce student mastery of concepts taught in the parent courses.

Biotechnology
(See Footthill College Catalog.)

Business

BUS 10  Introduction to Business  5 Units
(Formerly Business 20.)
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273.
Five hours lecture.
An overview of the business disciplines, including a brief introduction to marketing, accounting, finance, management, human resources, information technologies, economics, international business, business planning, and the role of business in society.

All courses are for unit credit and apply to a De Anza associate’s degree unless otherwise noted.
BUS 18 Business Law I 5 Units
Advisory: English Writing 1A or English as a Second Language 5; Business 10.
(Also listed as Paralegal 18. Student may enroll in either department, but not both, for credit.)
Five hours lecture.
The American legal system and laws applicable to business emphasizing contract, sales and agency laws, the impact of the legal system on business, and ethical considerations in the business environment.

BUS 21 Business and Society 5 Units
(See general education pages for the requirement this course meets.)
Advisory: English Writing 1A or English as a Second Language 5; Economics 2.
Five hours lecture.
An introduction to the study of the interactions and interdependencies between business, government, and society. Course will examine many individual cases of conflict between business and society, both current and historical, and will guide students to explore the lessons these cases hold for all current and future business managers.

BUS 51 Customer Service 4 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Four hours lecture.
Developing effectiveness in customer service situations and understanding the complex challenges of effective customer service. Adapting customer service techniques to build long term, successful customer relationships in a culturally diverse world.

BUS 52 Supervision in the Public Sector 5 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Five hours lecture.
A comprehensive study of the vital aspects of Supervision in the Public Sector with a focus on practical advice in how to handle real-life, on the job situations. Effectively performing supervisory duties in a culturally diverse society.

BUS 54 Business Mathematics 5 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 210 or equivalent.
Five hours lecture.
Basic mathematical operations and concepts as related to business and personal finance.

BUS 55 Introduction to Entrepreneurship 5 Units
(Formerly Small Business 95A.)
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Five hours lecture.
A practical study of the operations and essential skills required in small and start-up businesses. Emphasis on the opportunities and problems faced by entrepreneurs in meeting competition, purchasing, selling, staffing and financing an independent business. This course will prepare students for developing business plans.

BUS 56 Human Relations in Business 5 Units
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or
English as a Second Language 261, 262 and 263.
Five hours lecture.
Human relations behavior in business organizations emphasizing personal and interpersonal relationships; developing leadership for business success; future trends.

BUS 57 Human Resource Management 4 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Business 10 or 56.
Four hours lecture.
Introductory course designed to teach fundamental components of the Human Resource function. Focus on understanding and applying various roles of Human Resources (recruitment, legal issues, selection, assessment and development, compensation, benefits) provides to employees and the organization to meet individual, organizational diversity and societal objectives.

BUS 58 The Business Plan 4 Units
Advisory: Business 55.
Four hours lecture.
Effectively organize the resources required to establish a new business and obtain financing by writing an analysis of the prospective business enterprise.

BUS 59 Promoting Your Small Business 5 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Five hours lecture.
Affordable methods of promotion for small businesses. Emphasis on Internet marketing, public relations, relationship marketing, database marketing, and guerrilla marketing tactics. A promotion plan for the students’ (existing or planned) businesses will be developed.

BUS 60 International Business Management 5 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 210 or equivalent.
Five hours lecture.
International Business and its functions in a diverse global economy. Understanding cross-border trade and investment; distance, time zone and language issues; national differences in government regulation, culture and business systems.

BUS 61 Introduction to Technical Writing 5 Units
Prerequisite: English Writing 1A or English as a Second Language 5.
(Also listed as English Writing 61 and Technical Writing 61. Student my enroll in only one department for credit.)
Five hours lecture.
Technical writing skills focusing on basic techniques of exposition for the technical field, functional description, process writing, technical vocabulary, correct usage, and accurate editing.

BUS 62 Survey of Technical Writing 5 Units
Prerequisite: Business 61 or English Writing 61 or Technical Writing 61 (may be taken concurrently).
(Also listed as English Writing 62 and Technical Writing 62. Student may enroll in only one department for credit.)
Five hours lecture.
Technical writing skills focusing on short document formats, production of sections of various technical documents, and incorporation of graphics within text.

BUS 63 Technical Publications 5 Units
Prerequisite: Business 61 or English Writing 61 or Technical Writing 61.
(Also listed English Writing 63 and Technical Writing 63. Student may enroll in only one department for credit.)
Five hours lecture.
Technical writing and editing skills applied through individual and group assignments with emphasis on planning, scheduling, and producing longer reports, manuals, and instructions. Development of organizational skills and individual documentation solutions.

BUS 64 Technical Writing Seminar 5 Units
Prerequisite: Business 62 or 63; or English Writing 62 or 63; or Technical Writing 62 or 63.
(Also listed as English Writing 64 and Technical Writing 64. Student may enroll in only one department for credit.)
Five hours lecture.
Technical communication and editing skills applied through the preparation and presentation of a complete document according to the standards of the student’s chosen technical field.

BUS 65 Leadership 5 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Five hours lecture.
Develop effectiveness in leadership situations and understand the complex challenges of leadership. Adapt leadership techniques to build successful relationships in a culturally diverse world.

BUS 67A Federal Income Tax 4 Units
(Formerly Business 67.)
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 210 or equivalent;
Accounting 1A (may be taken concurrently).
(Also listed as Accounting 67A. Student may enroll in either department, but not both, for credit.)
Four hours lecture.
A study of current federal income tax law and the procedures for preparing an individual’s tax return.

BUS 67B Advanced Tax Accounting I 4 Units
(Formerly Business 68A.)
Prerequisite: Accounting 67A or Business 67A.
(Also listed as Accounting 67B. Student may enroll in either department, but not both, for credit.)
Four hours lecture.
A study of current federal income tax law and California income tax law as it relates to individuals and sole proprietorship taxes.

BUS 69 Investment Fundamentals 4 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273; Mathematics 210 or equivalent.
Four hours lecture.
Introduction to securities investment: securities characteristics and rights; selection and purchase of stock; analysis of financial statements; investment methods; technical market and stock analysis; impact on financial planning.
BUS 70 Principles of E-Business 5 Units
Theory and practice of effectively conducting and managing business over the Internet. Insights into e-business models, strategy, technology, auctions, and marketing. Students are expected to complete computer assignments.

BUS 80 Effective Organizational Communication 4 Units
(See general education pages for the requirement this course meets.) Advisory: English Writing 1A or English as a Second Language 5. (Also listed as Speech 70. Student may enroll in either department, but not both, for credit.) Four hours lecture. A study of organizational communication concepts and theories. Impact of networks, superior/subordinate message patterns, team building, climate, cultural and gender influences, communication technology, ethics, and globalization on organizational effectiveness. Emphasizes development of communication skills useful for working productively in a dynamic, collaborative, multicultural work environment.

BUS 85 Business Communication 3 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Computer Applications and Office Systems 84A and 84B. Three hours lecture. Application of writing skills to business communications; public relations functions of business correspondence.

BUS 87 Introduction to Selling 4 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273; Mathematics 210 or equivalent. Four hours lecture. Application of business and behavioral sciences in a selling environment. Building successful relationships in a culturally diverse world.

BUS 88 Managing Technology Projects 4 1/2 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273. (Also listed as Computer Information Systems 79. Student may enroll in either department, but not both, for credit.) Four hours lecture, one and one-half hours laboratory. Introduction to the theory and practice of the design and management of technology projects, including planning, performing, and monitoring of projects. Subjects explored are estimating costs and schedules, analyzing client expectations, guiding diverse groups of people toward a common goal, while earning a profit. Use of common software packages for project management.

BUS 89 Advertising 5 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273. Five hours lecture. Historical, economic, and social aspects of advertising; role of the advertising agency; media alternatives and the development of creative advertising copy; development of advertising budgets; analysis of successful advertising campaigns.

BUS 90 Principles of Marketing 5 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273. Five hours lecture. Fundamentals of marketing; product planning and development; pricing strategies; marketing channels.

BUS 91 Introduction to Personal Finance 3 Units
Three hours lecture. Students are introduced to a range of personal financial planning fundamentals including spending habits, taxes, saving, investing, and insurance. Discussion will include planning for major life events such as paying for college, buying a home, and retiring comfortably.

BUS 96A Principles of Management 5 Units
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273. Five hours lecture. Roles, functions, and responsibilities of management; the external environments and their impact on management.

BUS 96Y SolidWorks (Intermediate) 4 Units
Prerequisite: CAD and Digital Imaging 60C. Eight hours lecture-laboratory. Intermediate-level application of SolidWorks in creating solid models and drawings. Introduction to surface features and basic surfacing techniques.

BUS 96Z SolidWorks (Beginning) 4 Units

BUS 98U Internship, Business/Computer Systems Division 1 Unit
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273. Four hours laboratory per unit of supervised internship in an authorized office or agency. (Any combination of Accounting 98U-Z, Business 98U-Z, Computer Applications and Office Systems 98U-Z, and Computer Information Systems 98U-Z may be taken up to six times, not to exceed 18 units, for credit. During each internship, students will be placed at different employer locations, different working environments, and/or given different assignments within the same company or department—thus providing the students with various opportunities to learn different skills. Students may repeat the same internship location and working environment if the student, employer, and instructor believe it would provide the student with increased work experience.) Off-campus supervised experiential education/internship for Business/Computer Systems Division students in research or business office environments related to student's major. Practical application of knowledge, skills and abilities acquired in student's major. Opportunity for additional hands-on training. Exposure to varied corporate, state and federal protocols, methodologies and practices in a professional environment.

CDI 51 Geometric Dimensioning and Tolerancing 2 Units
Formerly CAD and Digital Imaging 51C.) Four hours lecture-laboratory. Geometric dimensioning and tolerancing, utilizing ANSI Y14.5M standards as they apply to engineering and manufacturing drawings and machining.

CDI 56 Special Projects in CAD 1 Unit
CDI 56X Special Projects in CAD 2 Units
CDI 56Y Special Projects in CAD 3 Units
Prerequisite: Consent of instructor and division dean. Three hours laboratory for each unit of credit. (Any combination of CAD and Digital Imaging 56, 56X and 56Y may be taken up to six times, not to exceed 18 units, as long as the projects are different each time.) Projects advancing student’s knowledge and experience in a selected area of CAD. Student will complete project objectives/requirements as determined in 3, 4, and 5 of the Special Projects Contract.

CDI 57B Simultaneous Product Development 4 Units
Eight hours lecture-laboratory. Product design using 3D CAD software. Application of simultaneous product development and design.

CDI 58B Unigraphics NX (Beginning) 4 Units

CDI 59B Unigraphics (Update) 4 Units
Eight hours lecture-laboratory. Principles and application changes in the Unigraphics software and system. Designed to upgrade users to the latest version yearly.

CDI 60C SolidWorks (Beginning) 4 Units

CDI 60D SolidWorks (Beginning) 4 Units

CDI 60E SolidWorks (Beginning) 4 Units

CDI 61C SolidWorks (Intermediate) 4 Units
Eight hours lecture-laboratory. Intermediate-level application of SolidWorks in creating solid models and drawings. Introduction to surface features and basic surfacing techniques.
All courses are for unit credit and apply to a De Anza associate's degree unless otherwise noted.

2010-2011 De Anza College Catalog
**CDI 77D** Pro/ENGINEER Wildfire (Pro/MECHANICA) 4 Units  
Prerequisite: CAD and Digital Imaging 70D.  
Eight hours lecture-laboratory.  
Application of Pro/MECHANICA to validate and optimize 3D models by measuring stress and displacement distributions of new designs through simulating responses to structural loads.

**CDI 78D** Pro/ENGINEER (Windchill ProductPoint) 2 Units  
Four hours lecture-laboratory.  
Product data management using Pro/ENGINEER (Windchill ProductPoint) software.  
Application of PDM for controlling and manipulating design files. Pro/ENGINEER (Windchill ProductPoint) is a CAD data management solution that captures file revision histories. Product design teams can access files, determine project status, and observe modification history of engineering designs.

**CDI 78E** Pro/ENGINEER (Windchill ProductPoint) 2 Units  
Four hours lecture-laboratory.  
Product data management using Pro/ENGINEER (Windchill ProductPoint) software.  
Application of PDM for controlling and manipulating design files. Pro/ENGINEER (Windchill ProductPoint) is a CAD data management solution that captures file revision histories. Product design teams can access files, determine project status, and observe modification history of engineering designs.

**CDI 79C** Pro/ENGINEER Wildfire (Update) 4 Units  
Eight hours lecture-laboratory.  
Principles and application changes in the Pro/ENGINEER software and system. Designed to upgrade users to the latest version yearly.

**CDI 79D** Pro/ENGINEER Wildfire (Update) 4 Units  
Eight hours lecture-laboratory.  
Principles and application changes in the Pro/ENGINEER software and system. Designed to upgrade users to the latest version yearly.

**CDI 80C** AutoCAD (Beginning) 4 Units  
Eight hours lecture-laboratory.  
Principles and applications of computer-aided design and drafting using AutoCAD software. Emphasis on 2D drawings and dimensioning.

**CDI 80D** AutoCAD (Beginning) 4 Units  
Eight hours lecture-laboratory.  
Principles and applications of computer-aided design and drafting using AutoCAD software. Emphasis on 2D drawings and dimensioning.

**CDI 81C** AutoCAD (Intermediate) 4 Units  
Prerequisite: CAD and Digital Imaging 80C.  
Eight hours lecture-laboratory.  
Intermediate mechanical design using AutoCAD software. Emphasis is on the CAD design process and drawing production. Drawings will be produced in 2-D and 3-D.

**CDI 81D** AutoCAD (Intermediate) 4 Units  
Prerequisite: CAD and Digital Imaging 80D.  
Eight hours lecture-laboratory.  
Intermediate mechanical design using AutoCAD software. Emphasis is on the CAD design process and drawing production. Drawings will be produced in 2-D and 3-D.

**CDI 82C** AutoCAD Civil 3D 4 Units  
Eight hours lecture-laboratory.  
Application of AutoCAD Civil 3D in creating manufacturing models.

**CDI 82D** AutoCAD Civil 3D 4 Units  
Eight hours lecture-laboratory.  
Application of AutoCAD Civil 3D in creating manufacturing models.

**CDI 83C** AutoDesk REVIT Architecture 4 Units  
Eight hours lecture-laboratory.  
Application of REVIT Architecture in creating building designs and extracting documents.

**CDI 83D** AutoDesk REVIT Architecture 4 Units  
Eight hours lecture-laboratory.  
Application of REVIT Architecture in creating building designs and extracting documents.

**CDI 85C** AutoDesk Inventor 4 Units  
Eight hours lecture-laboratory.  
Fundamentals of computer-aided design and drafting using AutoDesk Inventor software. Application of Inventor in creating manufacturing models.

**CDI 85D** AutoDesk Inventor 4 Units  
Eight hours lecture-laboratory.  
Fundamentals of computer-aided design and drafting using AutoDesk Inventor software. Application of Inventor in creating manufacturing models.

**CDI 88C** AutoCAD (Update) 4 Units  
Eight hours lecture-laboratory.  
Principles and application changes in the AutoCAD software. Designed to upgrade users to the latest version yearly.

**CDI 88D** AutoCAD (Update) 4 Units  
Eight hours lecture-laboratory.  
Principles and application changes in the AutoCAD software. Designed to upgrade users to the latest version yearly.

**CDI 90A** AutoDesk Inventor (Update) 4 Units  
Eight hours lecture-laboratory.  
Principles and application changes in the Inventor software and system. Designed to upgrade users to the latest version yearly.

**CDI 90B** Google SketchUp 3D 2 Units  
Four hours lecture-laboratory.  
Pass-No Pass (P-NP) course. Fundamentals of SketchUp 3D (Google). Application of software in creating 3D models and drawings using Google SketchUp 3D.

**CDI 100** CAD Technology Laboratory 1/2 Unit  
**CDI 100X** 1 Unit  
**CDI 100Y** 1 1/2 Units  
**CDI 100Z** 2 Units  
Credit course - Does not apply to De Anza Associate degree.  
Corequisite: Any CAD and Digital Imaging course.  
Three hours laboratory for each unit of credit.  
(Any combination of CAD and Digital Imaging 100, 100X, 100Y and 100Z may be taken up to six times for credit.)  
Pass-No Pass (P-NP) course.  
Use of CAD Technology labs for those who need/desire more time to complete application assignments.

**CDI 112A** Digital Imaging Software (Photoshop) 4 Units  
(Students may receive credit for either Computer Applications and Office Systems 112A or 112B and 112C; Arts 112A or 112B and 112C; or CAD and Digital Imaging 112A or 112B and 112C.)  
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or English as a Second Language 261, 262 and 263; Computer Applications and Office Systems 90GA.  
(Also listed as Arts112A and Computer Applications and Office Systems 112A.  
Student may enroll in only one department for credit.)  
Eight hours lecture-laboratory.  
Pass-No Pass (P-NP) course.  
Basic and intermediate principles using digital imaging software to produce graphics for Web sites. Introduction to digital imaging terminology and software. This course is for the content person to produce Web pages using digital images.

**CDI 112B** Digital Imaging Software (Photoshop) 2 Units  
(Students may receive credit for either Computer Applications and Office Systems 112A or 112B and 112C; Arts 112A or 112B and 112C; or CAD and Digital Imaging 112A or 112B and 112C.)  
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or English as a Second Language 261, 262 and 263; Computer Applications and Office Systems 90GA.  
(Also listed as Arts112B and Computer Applications and Office Systems 112B.  
Student may enroll in only one department for credit.)  
Four hours lecture-laboratory.  
Pass-No Pass (P-NP) course.  
Basic principles of using digital imaging software to produce graphics for Web sites. Introduction to digital imaging terminology and software. This course is for the content person to produce Web pages using digital images.

**CDI 112Q** Digital Imaging Software II (Photoshop) 2 Units  
(Students may receive credit for either Computer Applications and Office Systems 112A or 112B and 112C; Arts 112A or 112B and 112C; or CAD and Digital Imaging 112A or 112B and 112C.)  
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or English as a Second Language 261, 262 and 263; Computer Applications and Office Systems 90GA.  
(Also listed as Arts112Q and Computer Applications and Office Systems 112Q.  
Student may enroll in only one department for credit.)  
Four hours lecture-laboratory.  
Pass-No Pass (P-NP) course.  
Basic and intermediate principles of using digital imaging software to produce graphics for Web sites. Introduction to digital imaging terminology and software. This course is for the content person to produce Web pages using digital images.
C

CANT 1 Elementary Cantonese (First Quarter) 5 Units
(See general education pages for the requirement this course meets.)
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
(Also listed as Arts 114A and Computer Applications and Office Systems 114A.
Student may enroll in only one department for credit.)
Six hours lecture-laboratory.
Pass-No Pass (P-NP) course.
Basic and intermediate principles of graphics/animation for the Web. Web graphics/
animation terminology and software. This course is for the content person to build
a Web site.

CANT 2 Elementary Cantonese (Second Quarter) 5 Units
(See general education pages for the requirement this course meets.)
Prerequisite: Cantonese 1 (equivalent to one year of high school Cantonese) or
equivalent.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Five hours lecture.
Further development of material presented in Cantonese 1. Presentation and study
of the second quarter elementary-level of Cantonese language and the culture of
Guangdong Province. Basic speaking, listening, reading and writing of Cantonese
will be continued and practiced within a cultural context. Emphasis will be on
language as an expression of culture.

CANT 3 Elementary Cantonese (Third Quarter) 5 Units
(See general education pages for the requirement this course meets.)
Prerequisite: Cantonese 2 (equivalent to two years of high school Cantonese) or
equivalent.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Five hours lecture.
Further development of material presented in Cantonese 1 and Cantonese 2.
Presentation and study of the third quarter elementary-level of Cantonese language
and the culture of Guangdong Province. Basic speaking, listening, reading and
writing of Cantonese will be further introduced within a cultural context. Emphasis
will be on language as an expression of culture.

CANT 50A Cantonese - Introductory
Conversation (First Quarter) 3 Units
Three hours lecture.
An introduction to the language and cultures of Cantonese-speaking communities.
Spoken Cantonese will be introduced with focus on pronunciation and vocabulary, in
connection with elements of Chinese and Cantonese culture necessary to understand
the language. Intensive drills in the patterns and idioms of daily speech will be
supported by sufficient grammar to give flexibility in the spoken language.

CANT 50B Cantonese - Introductory
Conversation (Second Quarter) 3 Units
Prerequisite: Cantonese 50A or equivalent.
Three hours lecture.
The next course in the introductory conversation Cantonese sequence, following
Cantonese 50A. Continues the introduction to the language and culture of Cantonese-
speaking communities. The vocabulary and grammatical structures mastered
in Cantonese 50A will be consolidated and further developed, in conjunction
with elements of Chinese and Cantonese culture. Emphasis will be on practical
communication for everyday use, particularly conversational fluency.

CANT 50C Cantonese - Introductory
Conversation (Third Quarter) 3 Units
Prerequisite: Cantonese 50B or equivalent.
Three hours lecture.
The next course in the introductory conversation Cantonese sequence, following
Cantonese 50B. Continues the introduction to the language and culture of Cantonese-
speaking communities. The vocabulary and grammatical structures mastered
in Cantonese 50B will be consolidated and further developed, in conjunction
with elements of Chinese and Cantonese culture. Focus will be on speaking and
comprehension proficiency.

CANT 61A Cantonese - Intermediate
Conversation (First Quarter) 3 Units
Prerequisite: Cantonese 60C or equivalent.
Three hours lecture.
The first course in the intermediate conversation Cantonese sequence, following
Cantonese 60C. Continues the introduction to the language and culture of Cantonese-
speaking communities. The vocabulary and grammatical structures mastered
in Cantonese 60B will be consolidated and further developed, in conjunction
with elements of Chinese and Cantonese culture. Focus will be on speaking and
comprehension proficiency.

CANT 61B Cantonese - Intermediate
Conversation (Second Quarter) 3 Units
Prerequisite: Cantonese 61A or equivalent.
Three hours lecture.
The next course in the intermediate conversation Cantonese sequence, following
Cantonese 61A. Continues the introduction to the language and culture of Cantonese-speaking communities in the world. The vocabulary and grammatical structures mastered in Cantonese 61A will be consolidated and further developed, in conjunction with elements of Chinese and Cantonese culture and history to be discussed in class. Elements of Chinese for business are further introduced such as meeting discussions.

C

CDI 114A Web Graphics/Animation Software (Flash) 3 Units
(Students may receive credit for either Computer Applications and Office
Systems 114A (or 114I and 114Q); or Arts 114A (or 114I and 114Q); or CAD and
Digital Imaging 114A.)
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or
English as a Second Language 261, 262 and 263; Computer Applications and
Office Systems 112A (or 112I and 112Q); or Arts 112A (or 112I and 112Q); or
CAD and Digital Imaging 112A (or 112I and 112Q).
(Also listed as Arts 114A and Computer Applications and Office Systems 114A.
Student may enroll in only one department for credit.)
Six hours lecture-laboratory.
Pass-No Pass (P-NP) course.
Basic and intermediate principles of graphics/animation for the Web. Web graphics/
animation terminology and software. This course is for the content person to build
a Web site.

CDI 116A Web Development Graphics
Software (Illustrator) 4 Units
(Students may receive credit for either Computer Applications and Office
Systems 116A (or 116I and 116Q); or Arts 116A (or 116I and 116Q); or CAD and
Digital Imaging 116A.)
Prerequisite: Computer Applications and Office Systems 112A (or 112I and
112Q); or Arts 112A (or 112I and 112Q); or CAD and Digital Imaging 112A (or
112I and 112Q).
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or
English as a Second Language 261, 262 and 263.
(Also listed as Arts 116A and Computer Applications and Office Systems 116A.
Student may enroll in only one department for credit.)
Eight hours lecture-laboratory.
Pass-No Pass (P-NP) course.
Basic and intermediate principles of using vector-based graphics software to
produce graphics for Web sites. Introduction to vector-based graphics terminology
and software. This course is for the content person to produce vector graphic
images.

CDI 117A Advanced Digital Imaging
Software (Photoshop) 3 Units
Prerequisite: Computer Applications and Office Systems 112A, or Arts 112A, or
CAD and Digital Imaging 112A.
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or
English as a Second Language 261, 262 and 263; Computer Applications and
Office Systems 90GA.
(Also listed as Arts 117A and Computer Applications and Office Systems 117A.
Student may enroll in only one department for credit.)
Six hours lecture-laboratory.
Pass-No Pass (P-NP) course.
Advanced principles and techniques of using digital imaging software to produce
graphics for Web sites and printed media. Integration of digital imaging software
with Web authoring software. This course is for the content person wishing to
produce digital images for Web pages and print media.

CDI 118A Advanced Web Graphics/
Animation Software (Flash) 3 Units
Prerequisite: Computer Applications and Office Systems 114A, or Arts 114A, or
CAD and Digital Imaging 114A.
Advisory: English Writing 200 and Reading 200 (or Language Arts 200), or
English as a Second Language 261, 262 and 263; Computer Applications and
Office Systems 90GA.
(Also listed as Arts 118A and Computer Applications and Office Systems 118A.
Student may enroll in only one department for credit.)
Six hours lecture-laboratory.
Pass-No Pass (P-NP) course.
An advanced Flash course that is projects and portfolio based and taught from a
designer perspective. Students will be taught how to build a portfolio and animated
multimedia presentation. Basic programming skills will be taught along with
developing interactive Web-based multimedia presentations using ActionScripts,
sound and graphics.

Cantonese

CANT 1 Elementary Cantonese (First Quarter) 5 Units
(See general education pages for the requirement this course meets.)
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Five hours lecture.
The first course in the elementary conversation Cantonese sequence, following
Cantonese 1. Continues the introduction to the language and culture of Cantonese-
speaking communities. The focus will be on speaking and comprehension.

CANT 2 Elementary Cantonese (Second Quarter) 5 Units
(See general education pages for the requirement this course meets.)
Prerequisite: Cantonese 1 (equivalent to one year of high school Cantonese) or
equivalent.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Five hours lecture.
The second course in the elementary conversation Cantonese sequence, following
Cantonese 1. Continues the introduction to the language and culture of Cantonese-
speaking communities. The focus will be on speaking and comprehension.

CANT 3 Elementary Cantonese (Third Quarter) 5 Units
(See general education pages for the requirement this course meets.)
Prerequisite: Cantonese 2 (equivalent to two years of high school Cantonese) or
equivalent.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Five hours lecture.
The third course in the elementary conversation Cantonese sequence, following
Cantonese 2. Continues the introduction to the language and culture of Cantonese-
speaking communities. The focus will be on speaking and comprehension.

CANT 4 Elementary Cantonese (Fourth Quarter) 5 Units
(See general education pages for the requirement this course meets.)
Prerequisite: Cantonese 3 (equivalent to three years of high school Cantonese) or
equivalent.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or
English as a Second Language 272 and 273.
Five hours lecture.
The fourth course in the elementary conversation Cantonese sequence, following
Cantonese 3. Continues the introduction to the language and culture of Cantonese-
speaking communities. The focus will be on speaking and comprehension.
CHEM 12A Organic Chemistry 5 Units
Prerequisite: Chemistry 1C with a grade of C or better.
Advisory: English Writing 1A or English as a Second Language 5.
Three hours lecture, six hours laboratory.
An introduction to the physical properties and chemical behavior of important classes of organic compounds, focusing on hydrocarbons and halolkanes. Emphasis on retrosynthesis, spectroscopic structure determination, and reaction mechanism. Laboratory experiments involving the synthesis of simple compounds and the characterization of those compounds using gas chromatography (GC) and infrared (IR), ultraviolet-visible (UV-Vis) and nuclear magnetic resonance (NMR) spectroscopy. For chemistry majors or those in closely allied fields such as biochemistry and chemical engineering.

CHEM 12B Organic Chemistry 5 Units
Prerequisite: Chemistry 12A with a grade of C or better.
Advisory: English Writing 1A or English as a Second Language 5.
Three hours lecture, six hours laboratory.
An exploration of the physical properties and chemical behavior of important classes of organic compounds, focusing on polyenes; aromatic compounds; alcohols, thiols, and ethers; and aldehydes and ketones and their derivatives. Emphasis on retrosynthesis, spectroscopic structure determination, and reaction mechanism. Laboratory experiments involving the synthesis of simple compounds and the characterization of those compounds using chromatography and infrared (IR), ultraviolet-visible (UV-Vis) and nuclear magnetic resonance (NMR) spectroscopy. For chemistry majors or those in closely allied fields such as biochemistry and chemical engineering.

CHEM 12C Organic Chemistry 5 Units
Prerequisite: Chemistry 12B with a grade of C or better.
Advisory: English Writing 1A or English as a Second Language 5.
Three hours lecture, six hours laboratory.
An exploration of the physical properties and chemical behavior of important classes of organic compounds, focusing on amines, carboxylic acids, and carboxylic acid derivatives, with an introduction to the chemistry of terpenes, lipids, carbohydrates, and proteins. Emphasis on retrosynthesis, spectroscopic structure determination, and reaction mechanism. Laboratory experiments involving the multi-step synthesis of organic compounds and characterize those compounds using chromatography and infrared (IR), ultraviolet-visible (UV-Vis) and nuclear magnetic resonance (NMR) spectroscopy. For chemistry majors or those in closely allied fields such as biochemistry and chemical engineering.

CHEM 30A Survey of Chemistry 5 Units
Prerequisite: Mathematics 114 or equivalent.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273.
Four hours lecture, three hours laboratory.
An introduction to fundamental topics in general and inorganic chemistry as preparation for the biological and health sciences.

CHEM 30B Survey of Chemistry 5 Units
Prerequisite: Chemistry 30A.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273.
Four hours lecture, three hours laboratory.
An introduction to fundamental topics in general and organic chemistry as preparation for the biological and health sciences.

CHEM 50 Preparation Course for General Chemistry 5 Units
Prerequisite: Mathematics 114 or equivalent.
Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273.
Four hours lecture, three hours laboratory.
An introduction to the core theory and problem-solving techniques of chemistry as preparation for Chemistry 1A and other science related fields. An introduction to gravimetric and volumetric analysis, rudimentary laboratory equipment and operations, and the preparation and maintenance of a laboratory notebook.

CHEM 77 Special Projects in Chemistry 1 Unit
Prerequisite: Consent of instructor and division dean.
Three hours laboratory for each unit of credit.
(Any combination of Chemistry 77, 77X and 77Y may be taken up to six times, not to exceed 18 units, as long as the projects are different each time.)
Pass-No Pass (P-NP) course.
Individual special reading, writing, or study projects in chemistry as determined in consultation with the instructor.