STATE OF CALIFORNIA

JACK SCOTT, CHANCELLOR

CALIFORNIA COMMUNITY COLLEGES
CHANCELLOR'S OFFICE
1102 Q STREET
SACRAMENTO, CA 95811-6549
(916) 445-8752
http://www.cccco.edu

October 6, 2009

Kathy Berry, Vice President
Academic Services
Imperial Valley College
380 East Aten Road
Imperial, CA 92251-0158

Dear Dr. Berry:

The Chancellor's Office hereby approves Imperial Valley College's Associate in Science degree in **Computer Science**. This program has been entered into the Inventory of Approved Programs under T.O.P. code 0706.00, with career technical education and transfer status, and with unique program code **19593**.

The California Postsecondary Education Commission (CPEC) has authorized the Chancellor's Office to proceed to final approval, without its review, on many new community college programs, except programs of certain types that are of special interest to CPEC. This program is not a type that has been reserved for individual CPEC review and concurrence. Therefore, our approval is effective with this letter.

Good luck with this program. If there are any questions about our action, please contact me at (916) 322-6888, fax (916) 445-6268, or e-mail to lows@cccco.edu.

Sincerely,

S. Low

Stephanie Low
Acting Dean, Academic Affairs
California Community Colleges, Chancellor's Office

cc: Allyn Leon, Mathematics

i. **CS 280, ASSEMBLY LANGUAGE AND MACHINE ORGANIZATION (4.0)**

M/S/C Zhao/Guinn *to approve the revision of the course prerequisite for CS 280, for the 2008 - 2009 academic year, as presented. The motion carried.*

j. **MATH 080, BEGINNING ALGEBRA (3.0)**
k. **MATH 090, INTERMEDIATE ALGEBRA (4.0)**

M/S/C Pollock-Blevins/Jaime *to approve the revision of the course prerequisite and upgrading of textbooks for MATH 080 and MATH 090, for the 2008 - 2009 academic year, as presented. The motion carried.*

l. **MUS 176, REHEARSAL AND PERFORMANCE (1.0)**

M/S/C Guinn/Pollock-Blevins *to approve the revision of the course number from MUS 26ABCD to MUS 176, to reflect course number changes made in 2004 – 2005 during the conversion to Banner, and the upgrading of textbooks for MUS 176, for the 2008 - 2009 academic year, with correction. The motion carried.*

m. **NURS 110, NURSING PROCESS I (4.5)**
n. **NURS 125, NURSING PROCESS AND APPLICATIONS II (8.5)**
o. **NURS 231, NURSING PROCESS AND APPLICATIONS III (8.5)**
p. **NURS 241, NURSING PROCESS AND APPLICATIONS IV (8.5)**
q. **VN 110, INTRODUCTION TO PATIENT CARE I (5.0)**
r. **VN 122, COMMON HEALTH PROBLEMS I (5.5)**
s. **VN 130, COMMON HEALTH PROBLEMS II (5.5)**
(ITEMS m – s WERE ACTED UPON ALL TOGETHER UNDER ONE MOTION)

It was noted that the proposed course revisions were denoted in bold font on Form 1 for each course.

M/S/C Pollock-Blevins/Byrd *to approve the addition of a fees statement to the course description for NURS 110, NURS 125, NURS 231, NURS 241,VN 110, VN 122 and VN 130, for the 2008 - 2009 academic year, with corrections. The motion carried.*

It was recommended that the dollar amounts be excluded from the fees statement to eliminate the need to revise the course description every time the fees changed.

C. MAJORS AND CERTIFICATES

1. New Majors and Certificates

a. COMPUTER SCIENCE MAJOR

M/S/C Zhao/Huerta *to approve the new COMPUTER SCIENCE Associate in Science (A.S.) Degree, commencing with the 2008 – 2009 academic catalog, with corrections. The motion carried.*

Corrections included increasing the units required for the major from 30 to 31 units, and replacing MATH 120, STATISTICS (3.0 UNITS) with MATH 119, ELEMENTARY STATISTICS (4.0 UNITS). The major is pending submission and approval by the California Community College Chancellor's office.

2. Revised Majors and Certificates

a. AGRICULTURAL BUSINESS MANAGEMENT MAJOR

M/S/C Huerta/Zielinski *to approve the addition of AG 101, Survey of Agriculture in the Modern World, as a required course under section I, for the AGRICULTURAL BUSINESS MANAGEMENT Associate in Science (A.S.) Degree, commencing with the 2008 – 2009 academic catalog, as presented. The motion carried.*

b. AGRICULTURAL BUSINESS MANAGEMENT CERTIFICATE

M/S/C Huerta/Zielinski *to approve the addition of AG 101, Survey of Agriculture in the Modern World, as an acceptable course selection for the AGRICULTURAL BUSINESS MANAGEMENT Certificate, commencing with the 2008 – 2009 academic catalog, as presented. The motion carried.*

c. AGRICULTURAL CROP SCIENCE CERTIFICATE

M/S/C Huerta/Zielinski *to approve the addition of AG 101, Survey of Agriculture in the Modern World, as an acceptable course under section II, for the AGRICULTURAL CROP SCIENCE Certificate, commencing with the 2008 – 2009 academic catalog, as presented. The motion carried.*

d. AGRICULTURAL SCIENCE MAJOR

M/S/C Huerta/Zielinski *to approve the addition of AG 101, Survey of Agriculture in the Modern World, as a required course under section I, for the AGRICULTURAL SCIENCE Associate in Science (A.S.) Degree, commencing with the 2008 – 2009 academic catalog, as presented. The motion carried.*

e. GENERAL SCIENCE MAJOR

M/S/C Huerta/Zielinski *to approve the addition of AG 101, Survey of Agriculture in the Modern World, as an acceptable course under section III, for the GENERAL SCIENCE Associate in Science (A.S.) Degree, commencing with the 2008 – 2009 academic catalog, as presented. The motion carried.*

f. LIFE SCIENCE MAJOR

M/S/C Huerta/Zielinski *to approve the addition of AG 101, Survey of Agriculture in the Modern World, as an acceptable course under AREA II, for the LIFE SCIENCE Associate in Science (A.S.) Degree, commencing with the 2008 – 2009 academic catalog, as presented. The motion carried.*

D. NONCREDIT COURSES

1. New Noncredit Courses

a. BIOL 820, ANATOMY AND PHYSIOLOGY REVIEW (54.0 lecture hours)

M/S/C Zhao/Guinn *to approve the addition of BIOL 820, to the noncredit course curriculum, effective winter 2008, with corrections. The motion carried.*

Corrections included revisions to the course description to identify the TEAS examination as a "nursing assessment readiness exam."

E. DISTANCE EDUCATION COURSES - ADDENDUM DOCUMENTATION

1. PD 100, PERSONAL AND CAREER DEVELOPMENT (3.0)

M/S/C Jaime/Ceasar *to approve the Distance Education Addendum for PD 100, commencing with the Spring 2008 term, to provide greater access and allow the inclusion of all modalities of learning, with corrections. The motion carried.*

III. DISCUSSION ITEMS

A. Title 5 Changes

Kathy Berry shared with the committee the information she obtained from the recent CIO conference regarding the Title 5 revisions. She explained the impact on IVC's processes, stating that under existing processes when students complete certificates with values of 12 – 17 units IVC transcripts reflect completion of a certificate, which is incorrect according to Title 5. She stressed the need for divisions to review and fix existing certificates, submit them to C&I as new majors, and then submit the new majors to the Chancellor's Office. Kathy stated the issue is not a catalog issue at this time but anticipates it will become one in 2008 – 2009. She foresees the need for an addendum to the 2008 – 2009 catalog since the major and/or certificate approval paperwork must be submitted to Region X for signatures before submission to the Chancellor's Office.

B. Curriculum and Instruction – Relationship With SLOs

Kathy Berry explained the need for the college to tie SLO's to curriculum in a more formal manner; she asked members to keep this in mind when completing the various C & I forms.

C. It was announced that the college received official notification of certification for local approval of stand-alone credit courses.

IV. INFORMATION ITEMS

V. OTHER ITEMS – None.

VI. NEXT REGULAR MEETING

Next meeting 3:05 p.m., Thursday, December 6, 2007, Board Room.
MATERIALS DUE: 5:00 P.M., Wednesday, November 28, 2007

VII. Adjournment

The meeting was adjourned at 4:40 p.m.

IMPERIAL VALLEY COLLEGE
CURRICULUM AND INSTRUCTION COMMITTEE MEETING
ADOPTED MINUTES
REGULAR MEETING
THURSDAY, November 15, 2007
3:05 p.m. – Board Room

Present:	Kathy Berry Krista Byrd Ted Ceasar	Melani Guinn Gonzalo Huerta Victor Jaime	Carol Lee David Lopez **Diedre Pollock-Blevins**	Val Rodgers Lianna Zhao David Zielinski
Consultants:	Frances Beope	Norma Nunez	Efrain Silva	Kathy Westerfield
Absent:	David Drury	Robin Ying		
Visitors:	Jessica Waddell	Mardjan Shokoufi		
Recorder:	Linda Amidon			

I. Opening of the Meeting

A. Call to Order of Regular C & I Meeting – Carol Lee, Co-Chair

Carol Lee, Co-Chair, called the regular meeting of the Imperial Valley College Curriculum and Instruction Committee to order at 3:09 p.m., on Thursday, November 15, 2007. The order of the agenda items was rearranged as follows:

Original Order	**Revised Order**
C. MAJORS AND CERTIFICATES	B. CREDIT COURSES
B. CREDIT COURSES	B.1. Deleted Courses
B.1. New Courses	B.2. New Courses
B.2. Revised Courses	B.3. Revised Courses
B.3. Deleted Courses	C. MAJORS AND CERTIFICATES

B. Approval of the Minutes of November 1, 2007

M/S/C Zhao/Guinn *to approve the C & I meeting minutes of November 1, 2007, with corrections. The motion carried. Corrections were made to the start time of the meeting, and to the members that approved and seconded the motion to approve the October 18 minutes.*

II. ACTION ITEMS

A. RESCISSION OF COMMITTEE ACTION

1. Rescission of Action Taken August 16, 2007: Termination of CAN Statements in General Catalog

M/S/C Jaime/Ceasar *to rescind the motion that authorized the removal of the CAN (California Articulation Numbering) System statements, as requested by the California Community College Chancellor's Office (CCCCO) at the November 5, 2007 Region X Articulation Officer meeting, which was action was taken by the C & I Committee at its meeting of August 16, 2007. The motion carried.*

"**M/S/C Jaime/Ceasar** to approve the termination of CAN (California Articulation Numbering) System statements in the General Catalog, since the system has been terminated statewide, effective with the 2008 – 2009 academic calendar, as presented."

Carol explained the change was made due to controversy over LDTP.

2. **Rescission of Action Taken October 18, 2007: Approval to Grant Priority Registration to Declared Agriculture Majors**

M/S/C Zhao/Pollock-Blevins *to approve the rescission of the following action taken by the C & I Committee at its meeting of October 18, 2007. The motion carried.*

> "**M/S/C Zhao/Byrd** to support granting priority registration to declared Agriculture majors under the IVC Priority Registration Category B, presently assigned to athletes, ASG, and ASPIRE students, to commence with the fall 2008 term."

Kathy Berry explained that the action was being rescinded; however, the goal is to bring back the item with procedures for monitoring eligibility in place.

B. CREDIT COURSES

1. **Deleted Courses**

   a. **CHEM 140, INTEGRATED CHEMISTRY (4.0)**
   b. **CS 210, OBJECT ORIENTED PROGRAMMING USING JAVA (4.0)**
   c. **CS 260, DATA STRUCTURES USING JAVA (4.0)**
   d. **MATH 120, INTRODUCTORY STATISTICS WITH APPLICATIONS (3.0)**

   M/S/C Zhao/Guinn *to approve the deletion of CHEM 140, CS 210, CS 260, and MATH 120 from the credit curriculum, effective with the 2008 – 2009 academic year, as presented. The motion carried.*

   Lianna Zhao explained that CHEM 160, a five unit course, replaced CHEM 140, a four unit course, since SDSU no longer accepts the four-unit course. She explained that CS 210, CS 260 and MATH 120 are replaced by CS 220, CS 230 and MATH 119, respectively, to allow for more advanced contact and better articulation.

2. **New Courses**

   a. **AG 101, AGRICULTURE IN THE MODERN WORLD (4.0)**

   M/S/C Zhao/Pollock-Blevins *to approve the addition of AG 101 to the credit curriculum to expand offerings that meet the demand for general education in the biological sciences, for the 2008 – 2009 academic year, as presented. The motion carried. (Carol Lee abstained from voting.)*

   It was noted that if the course were offered summer 2008, the course would be transferable but it would not be eligible for general education. The committee agreed to begin offering the course fall 2008.

   b. **CS 220, INTRODUCTORY OBJECT-ORIENTED PROGRAMMING WITH JAVA (4.0)**
   (TITLE CHANGED TO: "INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING USING JAVA")

   M/S/C Zhao/Jaime *to approve the addition of CS 220 to the credit curriculum, which is a required course for the Computer Science major, certificate and transfer programs, for the 2008 – 2009 academic year, with corrections to the course title. The motion carried.*

c. **CS 230, INTERMEDIATE OBJECT-ORIENTED PROGRAMMING WITH JAVA (4.0)**
(TITLE CHANGED TO: "INTERMEDIATE OBJECT-ORIENTED PROGRAMMING USING JAVA)

M/S/C Zhao/Guinn *to approve the addition of CS 230 to the credit curriculum, which is a required course for the Computer Science major, certificate and transfer programs, for the 2008 – 2009 academic year, with corrections to the course title. The motion carried.*

d. **JRN 108, CRITICAL REASONING AND WRITING (3.0)**
(COURSE NUMBER CHANGED TO: JRN 108)

M/S/C Guinn/Byrd *to approve the addition of JRN 108 to the credit curriculum, to expand the offerings for critical thinking requirements for transfer and to assist students in pursuing careers in journalism and communication, for the 2008 – 2009 academic year, as presented. The motion carried.*

e. **MATH 119 INTRODUCTORY STATISTICS WITH APPLICATIONS (4.0)**
(TITLE CHANGED TO: "ELEMENTARY STATISTICS")

M/S/C Zhao/Guinn *to approve the addition of MATH 119 to the credit curriculum, which is a replacement course for MATH 120, INTRODUCTORY STATISTICS WITH APPLICATIONS, for the 2008 – 2009 academic year, with corrections to the course title. The motion carried.*

3. **Revised Courses**

a. **AHP 060, HEALTH ASSISTANT (6.0)**
b. **AHP 074, CLINICAL EXTERNSHIP I (2.0)**

M/S/C Pollock-Blevins/Rodgers *to approve the revision of the course description for AHP 060 and AHP 074, to include a fees statement, effective with the 2008 - 2009 academic year, with corrections. The motion carried.*

It was recommended that the dollar amounts be excluded from the fees statement to eliminate the need to revise the course description every time the fees changed.

c. **BIOL 134, FIELD ECOLOGY AND CONSERVATION BIOLOGY (3.0)**

M/S/C Zhao/Pollock-Blevins *to approve the revision of the course description for BIOL 134, to correct editorial errors, effective with the 2008 - 2009 academic year, with corrections. The motion carried.*

It was recommended that the statement, "Instructor approval is required prior to registration," be deleted from the course description, and that the statement, "Travel fees are required" be changed to read, "Travel fees are required. See instructor for details."

d. **CHEM 100, INTRODUCTION TO CHEMISTRY (4.0)**
e. **CHEM 200, GENERAL INORGANIC CHEMISTRY I (5.0)**
f. **CHEM 202, GENERAL INORGANIC CHEMISTRY II (5.0)**
g. **CHEM 204, ORGANIC CHEMISTRY I (5.0)**
h. **CHEM 206, ORGANIC CHEMISTRY II (5.0)**
(ITEMS d – h WERE WITHDRAWN)

M/S/C Zhao/Byrd *to approve the revision of the course description for CHEM 100, 200, 202, 204 and 206, to reflect that multiple sections of lectures may be combined into a single lecture, and to include a science lab breakage fee and a fee for supplemental science lab manual materials, effective with the 2008 - 2009 academic year, as presented.* ***THE MOTION WAS WITHDRAWN.***

IMPERIAL VALLEY COLLEGE
P.O. Box 158, Imperial, California 92251
(760) 352-8320 • FAX (760) 355-2663

Kathy Berry, R.N., M.S.N.
Vice President for Academic Services
Email: kathy.berry@imperial.edu
Telephone: (760) 355-6213
Fax: (760) 355-2663

May 4, 2009

Ms. Stephanie Low
Specialist, Academic Planning & Development
Academic Affairs Division
California Community Colleges Chancellor's Office
1102 Q Street
Sacramento, CA 95814-6511

Re: Signature Page – Application for Approval – New Credit Program (Form CCC- 501)
Associate of Science Degree - Computer Science

Dear Ms. Low:

Enclosed please find the original signature page signed by the regional consortium chair, Al Taccone.

If you have questions or require further information, please contact me.

Very truly yours,

Kathy Berry

Kathy Berry, R.N., M.S.N.
Vice President for Academic Services

KB:eja

Enclosure

CCC-501: APPROVAL–NEW CREDIT PROGRAM Rev. Oct. 2007

REQUIRED SIGNATURES

Program Associate of Science in Computer Science College Imperial Valley College

LIBRARY AND LEARNING RESOURCES

Library and learning resources needed to fulfill the objectives of the program are currently available or are adequately budgeted for.

DATE	SIGNATURE, CHIEF LIBRARIAN/LEARNING RESOURCES MANAGER	TYPED OR PRINTED NAME
5/15/08		Rosa C. Ritons

CAREER TECHNICAL EDUCATION ONLY:

Program fulfills the requirements of employers in the occupation, provides students with appropriate occupational competencies, and meets any relevant professional or licensing standards.

DATE	SIGNATURE, ADMINISTRATOR OF CTE	TYPED OR PRINTED NAME
04.02.09		Gonzalo Huerta
4/6/09		Rosie M. Dunn

DATE	SIGNATURE, CHAIR, CTE ADVISORY COMMITTEE	TYPED OR PRINTED NAME

Program was recommended for approval by Regional Occupational Consortium on 4/17/09 (date).

DATE	SIGNATURE, CHAIR, REGIONAL CONSORTIUM	TYPED OR PRINTED NAME
4/17/09		Al Taccone

LOCAL CURRICULUM APPROVAL

Program and courses within the program have been approved by the curriculum committee and instructional administration, and satisfy all applicable requirements of Title 5 regulations.

DATE	SIGNATURE, CHAIR, CURRICULUM COMMITTEE	TYPED OR PRINTED NAME
5-15-08		CAROL E. LEE
5-15-08		CAROL E. LEE

DATE	SIGNATURE, ARTICULATION OFFICER	TYPED OR PRINTED NAME
5-15-08		Kathy Berry
5-15-08		BRUCE L. SEIVERTSON

DATE	SIGNATURE, CHIEF INSTRUCTIONAL OFFICER	TYPED OR PRINTED NAME
5-15-08		Kathy Berry
5-15-08		BRUCE L. SEIVERTSON

DATE	SIGNATURE, PRESIDENT, ACADEMIC SENATE	TYPED OR PRINTED NAME

COLLEGE PRESIDENT

All provisions of Title 5, Chapter 6 have been considered. The college is prepared to support establishment and maintenance of the proposed instructional program.

DATE	SIGNATURE, PRESIDENT OF THE COLLEGE	TYPED OR PRINTED NAME
5/27/08		Edward D. Gould

DISTRICT APPROVAL

On March 19, 2008, the governing board of the Imperial Community College District approved the instructional program attached to this application.

DATE	SIGNATURE, SUPERINTENDENT/CHANCELLOR OF DISTRICT	TYPED OR PRINTED NAME
5/27/08		Ed Gould, Ed.D.

SUBMIT ORIGINAL AND TWO COPIES OF THIS FORM AND ALL ATTACHMENTS

CCC-501

Rev. Oct. 2007

Application Date
4/11/2008

California Community Colleges

APPLICATION FOR APPROVAL—NEW CREDIT PROGRAM

Associate of Science in Computer Science
PROPOSED PROGRAM TITLE

Imperial Valley College
COLLEGE

Imperial Community College District
DISTRICT

Fall 2008
PROJECTED PROGRAM START DATE

Allyn Leon
CONTACT PERSON

Math Instructor
TITLE

(760) 355-6523
PHONE NUMBER

allyn.leon@imperial.edu
E-MAIL ADDRESS

GOAL(S) OF PROGRAM (CHECK ALL THAT APPLY):

☐ CAREER TECHNICAL EDUCATION (CTE) ☑ TRANSFER ☐ OTHER

TYPE OF PROGRAM (CHECK ALL THAT APPLY):

☐ A.A. DEGREE ☑ A.S. DEGREE CERTIFICATE OF ACHIEVEMENT: ○ 18+ semester (or 27+ quarter) units
○ 12-18 semester (or 18-27 quarter) units

PLANNING SUMMARY

Recommended T.O.P. Code	0706.00	Estimated FTE Faculty Workload	1
Units for Degree Major or Area of Emphasis	29	Number of New Faculty Positions	1
Total Units for Degree	60	Est. Cost, New Equipment	Grant Funded
Required Units-Certificate	N/A	Cost of New/Remodeled Facility	Grant Funded
Projected Annual Completers	15-25	Est. Cost, Library Acquisitions	N/A
Projected Net Annual Labor Demand (CTE)	N/A	When will this program undergo review as part of college's Program Evaluation Plan? YES	Month/Semester TBA Year TBA

DEVELOPMENT CRITERIA NARRATIVE & DOCUMENTATION

Attach a document that describes the development of the proposed program, addressing the five criteria as listed below. **Number** the sections of the narrative to match the lists below. If appropriate, you may note that a section is "not applicable" but **do not re-number** the sections. Provide documentation in the form of attachments as indicated.

Criteria A. Appropriateness to Mission

1. Statement of Program Goals and Objectives
2. Catalog Description
3. Program Requirements
4. Background and Rationale

Criteria B. Need

5. Enrollment and Completer Projections
6. Place of Program in Curriculum/Similar Programs
7. Similar Programs at Other Colleges in Service Area
8. Labor Market Information & Analysis (CTE only)
9. Employer Survey (CTE only)
10. Explanation of Employer Relationship (CTE only)
11. List of Members of Advisory Committee
12. Recommendations of Advisory Committee

Attachment: Labor / Job Market Data (CTE only)
Attachment: Employer Survey (CTE only)
Attachment: Minutes of Key Meetings

Criteria C. Curriculum Standards

13. Display of Proposed Sequence
14. Transfer Applicability (if applicable)

Attachment: Outlines of Record for Required Courses
Attachment: Transfer Documentation (if applicable)

Criteria D. Adequate Resources

15. Library and/or Learning Resources Plan
16. Facilities and Equipment Plan
17. Financial Support Plan
18. Faculty Qualifications and Availability

Criteria E. Compliance

19. Based on model curriculum (if applicable)
20. Licensing or Accreditation Standards
21. Student Selection and Fees

SUBMIT ORIGINAL AND TWO COPIES OF THIS FORM AND ALL ATTACHMENTS

CCC-501: APPROVAL–NEW CREDIT PROGRAM

Rev. Oct. 2007

REQUIRED SIGNATURES

Program Associate of Science in Computer Science College Imperial Valley College

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5/15/08	Rosa C. Ritons	Rosa C. Ritons

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DATE	SIGNATURE, ADMINISTRATOR OF CTE	TYPED OR PRINTED NAME

DATE	SIGNATURE, CHAIR, CTE ADVISORY COMMITTEE	TYPED OR PRINTED NAME

Program was recommended for approval by Regional Occupational Consortium on _____ (date).

DATE	SIGNATURE, CHAIR, REGIONAL CONSORTIUM	TYPED OR PRINTED NAME

LOCAL CURRICULUM APPROVAL

Program and courses within the program have been approved by the curriculum committee and instructional administration, and satisfy all applicable requirements of Title 5 regulations.

DATE	SIGNATURE	TYPED OR PRINTED NAME
5-15-08	Carol E. Lee	CAROL E. LEE
5-15-08	Carol E. Lee	CAROL E. LEE
5-15-08	Kathy Berry	Kathy Berry
5-15-08	Bruce L. Seivertson	BRUCE L. SEIVERTSON

DATE — SIGNATURE, CHAIR, CURRICULUM COMMITTEE — TYPED OR PRINTED NAME

DATE — SIGNATURE, ARTICULATION OFFICER — TYPED OR PRINTED NAME

DATE — SIGNATURE, CHIEF INSTRUCTIONAL OFFICER — TYPED OR PRINTED NAME

DATE — SIGNATURE, PRESIDENT, ACADEMIC SENATE — TYPED OR PRINTED NAME

COLLEGE PRESIDENT

All provisions of Title 5, Chapter 6 have been considered. The college is prepared to support establishment and maintenance of the proposed instructional program.

DATE	SIGNATURE, PRESIDENT OF THE COLLEGE	TYPED OR PRINTED NAME
5/27/08		Edward A. Gould

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DATE	SIGNATURE, SUPERINTENDENT/CHANCELLOR OF DISTRICT	TYPED OR PRINTED NAME
5/27/08		Ed Gould, Ed.D.

SUBMIT ORIGINAL AND TWO COPIES OF THIS FORM AND ALL ATTACHMENTS

Computer Science

Associate of Science Degree Program

MISSION

1. Statement of Program Goals and Objectives

The goal of this program is to prepare students to both enter the workforce highly qualified for technology related jobs and/or transfer into a baccalaureate level computer science programs at four-year institutions.

1. To provide students with a functional knowledge of computer science, including computer components, applications, and design.
2. To prepare students to develop computer programming skills that will enable them to succeed at the upper division college level or enter the workforce.
3. To enable students the ability to develop problem solving and critical thinking skills in computer applications and software design.
4. To provide students the opportunity to be well versed in a variety of programming languages.
5. To provide students an understanding of the social context of computing, enabling them to make sound ethical decisions regarding the use of computer technology in the workplace.
6. To introduce students to the diversity of professional opportunities available to those with a degree(s) in computer science.

2. Catalog Description

The Associate of Science degree in Computer Science prepares students for entry level technology positions in various public and private industries as well as for transfer to four-year institutions for continued study in Computer Science. The Imperial Valley College Computer Science degree program fulfills most of the lower division requirements for Computer Science majors at four-year-institutions. For specific requirements at four-year schools, transfer students should consult the catalog of the college or university of their choice. The core courses in the program offer instruction in Java and Assembly Language programming. Computer programmers and software engineers create, operate, maintain, and apply software applications that are necessary in most professional disciplines. Individuals with degrees in Computer Science are in high demand in most professional disciplines in both the public and private sectors. Many employers require a baccalaureate degree, but entry-level opportunities exist with an Associate degree, especially within the local community.

3. Program requirements

Imperial Valley College requires sixty (60) degree applicable units for graduation.

Computer Science Associate of Science Degree Requirements

Core Requirement **22 units**

All majors are required to take:

CS 230	Intermediate Object Oriented Programming Using Java	4 units
CS 280	Assembly Language and Machine Organization	4 units
MATH 119	Elementary Statistics	4 units
MATH 192	Calculus I	5 units
MATH 194	Calculus II	5 units

Electives **7 units**

All majors are required to take a minimum of seven (7) units from the following courses to include at least one (1) mathematics course and one (1) science course.

BIOL 180	General Biology: Molecules, Cells and Genetics	4 units
BIOL 182	General Biology: Principles of Organismal Biology	4 units
CHEM 200	General Inorganic Chemistry I	5 units
CHEM 202	General Inorganic Chemistry II	5 units
MATH 230	Introduction to Linear Algebra with Applications	3 units
MATH 240	Discrete Mathematics	3 units
PHYS 200	General Physics I	5 units
PHYS 202	General Physics II	5 units
PHYS 204	General Physics III	5 units

Institutional Requirements

A. American Institutions – Political Science 102 and History 120 or History 121 (6 units)
B. Health Education – Health Education 102 or Health Education 100 (3 units)
C. Physical Education 100 (2 units) and Physical Education Activity Course (1 unit) (3 units)

State Competency Requirements

A. Math Competency (placement score of 2006 or higher or pass Math 090 with a grade of "C" or better)
B. Reading Competency (placement score of 3006 or higher or pass English 089 or English 111 with a grade of "C" or better)

General Education

A. Language and Rationality
   1. English Communication – English 101 (3 units)
   2. Communication & Analytical Thinking (3 units)
B. Natural Science (3 units)
C. Humanities (3 units)
D. Social and Behavioral Sciences (3 units)
E. Elective (3 units)

4. Background and Rationale

An Associate degree program in Computer Science at Imperial Valley College is vital to the local community in order to supply both the growing labor needs as well as support the Bachelor degree program in Computer Science at IVC's Title V partner institution, San Diego State University- East campus. The local labor needs for individuals trained in technology has been documented by Mr. Bill Root, Senior Research Professor at San Diego State University. Mr. Root researched the needs of the local business interests by surveying over 70 businesses and public agencies associated with computer technology. The results of Mr. Root's research showed overwhelming support for the development of a Computer Science Associate degree program at Imperial Valley College with the majority of respondents indicating that they would be in a position to hire individuals with an Associates degree.

Be aware that in addition to businesses already operating locally, the Associate degree program in Computer Science will also play a vital role in meeting the future labor demands of the Silicon Border Project. The Silicon Border Project involves a consortium of national and global technology partners who are developing a 10,000 acre, high-technology industrial park, on the U.S.-Mexico Border seven miles south of the Imperial Valley College campus. The result of the Silicon Boarder Project will be the creation of an estimated 100,000 new technology related jobs in Imperial Valley.

In addition to providing a trained work force, this program is a necessary building block to the Bachelors degree program offered at San Diego State University- East campus just a few miles away from the Imperial Valley College campus. A Title V 2+2 cooperative grant was awarded to Imperial Valley College and San Diego State University-East in order to develop programs that would enable local students to earn both an Associate and a Bachelors degree in Computer Science locally. The Associate degree is designed so that students intending to earn a Bachelors degree in Computer Science at SDSU-East can seamlessly transfer into the university program. Upon entering the Bachelors degree program at SDSU-East, students only need to complete the upper division courses remaining for their degree. As you can see the Imperial Valley College Computer Science Associate degree program is vital to provide a trained work force and to act as a springboard for transfer to four-year-institutions.

NEED

5. Enrollment and Completer Projections

Number of core courses offered annually:

CS 230 = 2
CS 280 = 2
MATH 119 = 20
MATH 192 = 4
MATH 194 = 2

Annual student headcount in sections (estimated) = 840

Number of program completers (estimated for first year) = 15

Number of program completers (estimated for third year) = 21

Based on the increasing reliance of technological expertise in nearly all industries and academic disciplines we strongly believe that enrollments and completions will continue to increase following the third year of program operation.

6. Place of Program in Curriculum/Similar Programs

The Associate degree in Computer Science does not replace any existing programs at Imperial Valley College and reflects an addition to the college's curriculum. A degree in computer science will provide graduates with employment opportunities in technology, engineering and the scientific arena. Graduates will find work within these industries as programmers and analysts with the ability to conduct research and develop programs due to the strong mathematical background required for the degree. Graduates will be well versed in the theory and foundations of various programming languages. The Computer Science program is a necessary addition to the Imperial Valley College curriculum

The program most closely related to Computer Science at Imperial Valley College is the Associate of Science degree in Computer Information Systems. The Computer Information Systems program focuses on database and information management systems including; accounting, inventory, payroll, personnel and sales. The mathematics background required for the Computer Information Systems degree is different in scope and content than the requirement for the Computer Science degree. CIS graduates are normally employed in information management within a business setting.

The Computer Science program has required the development of an additional computer laboratory classroom originally not in existence on the IVC campus. A vacant room on campus has been turned into the Computer Science lab where all of the Computer Science courses are conducted. The funding for the lab came from the Title V

cooperative grant between Imperial Valley College and San Diego State University-East campus.

7. Similar Programs at Other Colleges in Service Area

Imperial Valley College is an isolated, rural college located in the border region of the southeastern most part of California and is less than ten miles from Mexicalli, Mexico. College of the Desert is the closest California Community College and is 95 miles away. Graduates and transfers from College of the Desert feed primarily into their partner university, California State University San Bernardino-Palm Desert campus. Imperial Valley College is the areas only opportunity for students to earn an Associate degree in Computer Science.

Of particular importance on this topic is the establishment of the Bachelors degree in Computer Science at San Diego State University-East campus. SDSU-East is less than 7 miles from Imperial Valley College and is primarily an upper-division campus. Therefore it is imperative Imperial Valley College provide most if not all of the lower division requirements for the Bachelors degree in Computer Science. Due to the specific role and mission of the community college within California, it is necessary that the IVC Computer Science program not only provide prepared transfer students for the SDSU Computer Science Bachelors program, but provide an Associate degree leading to meaningful employment for those individuals not seeking transfer.

8. Labor Market Information & Analysis (CTE only)

Not applicable.

9. Employer Survey (CTE only)

Not applicable.

10. Explanation of Employer Relationship (CTE only)

Not applicable.

11. List of Members of Advisory Committee

Not applicable.

12. Recommendations of Advisory Committee

Not applicable.

CURRICULUM STANDARDS

13. Display of Proposed Sequence

Academically prepared students at the college level will be able to complete the requirements for the Associate degree in Computer Science within four semesters. Attendance of Winter and Summer sessions are necessary to complete the degree requirements within two years.

Fall	**Year 1**
Course	**Units**
ENGL 101	3
MATH 140	3
CS 220	4
ENGL 89	3.5
HIST 120/121	3
Total	**16**

Spring	**Year 1**
Course	**Units**
MATH 192	5
CS 230	4
HE 102	3
PE 100	2
Total	**14**

Winter	**Year 1**
Course	**Units**
MATH 190	5
Total	**5**

Summer	**Year 1**
Course	**Units**
CHEM 100	4
PE Activity	1
Total	**5**

Fall	**Year 2**
Course	**Units**
MATH 194	5
MATH 240	3
Humanities	3
Soc./Beh. Sci.	3
Total	**14**

Spring	**Year 2**
Course	**Units**
CHEM 200	4
CS 280	4
SPCH 100	3
POLS 102	3
Total	**14**

Winter	**Year 2**
Course	**Units**
MATH 119	4
Total	**4**

14. Transfer Applicability

Outlines of record for all core courses and electives required for this degree program are located in the appendix. The new courses developed for Computer Science Degree are listed below. As noted in the table, the courses are awaiting articulation with other universities.

Computer Science: Imperial Valley College - - San Diego State University-East		
Computer Science Courses Imperial Valley College Required = R , Prerequisite = P	Articulation Status	Computer Science B.S. degree Required lower division courses San Diego State University
CS 220 (P) Beginning Object Oriented Programming Using Java	Articulation Pending	CS 107 Beginning Computer Programming
CS 230 (R) Intermediate Object Oriented Programming Using Java	Articulation Pending	CS 108 Intermediate Computer Programming
CS 280 (R) Assembly Language and Machine Organization	Articulation Pending	CS 237 Machine Organization and Assembly Language

ADEQUATE RESOURCES

15. Library and/or Learning Resources Plan

The library and learning resources at Imperial Valley College are being augmented in two ways. First, funding from the Title V cooperative grant is increasing the IVC Library resources by providing funds to purchase additional books and periodical journals for use in the IVC library. Secondly, a cooperative agreement has been established between Imperial Valley College and San Diego State University that allows IVC Computer Science students access to the materials and databases of the San Diego State University library.

16. Facilities and Equipment Plan

As mentioned under number 6 above Title V funds are being used to purchase computers and associated equipment. A room that was not in use has been converted to a computer laboratory classroom. Additionally, the Science, Math, and Engineering Division and Business Divisions are planning to develop additional classrooms.

Approximately 38,033 (blurb here about some of the specifics).

17. Financial Support Plan

Program and personnel costs during the first 3 years of program development have been financed by the 3.5 million dollar U.S. Department of Education Title V grant. During the fourth year of the program budgetary obligations have been transferred to Imperial Valley College. All necessary hardware requirements are in place.

Initially the Computer Science faculty member was funded by the 3.5 million dollar Title V grant which also funded the purchase of all equipment necessary for the start up of the program. The faculty position has now been institutionalized and is a permanent tenure-track position which has been filled. The approximate cost incurred by the district, including salary and benefits, is $68,000 every year.

18. Faculty Qualifications and Availability

All faculty involved in teaching courses in the major (and the electives) exceed state minimum qualifications for teaching courses at the community college level. Resumes of teaching faculty in the program are on file in Human Resources. The Computer Science Tenure Track faculty position has been filled and is a split position between Mathematics and Computer Science.

COMPLAINCE

19. Based on model curriculum

Not applicable.

20. Licensing or Accreditation Standards

Not applicable.

21. Student Selection and Fees

Imperial Valley College charges tuition fees of $20.00 per unit for California residents. The non-resident tuition is $173.00 per unit. Other required fees include a Student Representation Fee of $1.00 per term, Student Health Fee of $14.00 per semester and $11.00 for the Summer and Winter terms. The cost for on campus parking is $20 per vehicle per semester and $10.00 for the Summer and Winter terms. Financial aid and scholarships are available. These fees reflect the uniform fees assessed to all students attending Imperial Valley College based on residency status, there are no additional or "special" fees required to participate in the computer science program beyond the appropriate tuition and student fees.

No student selection process exists for admission to Imperial Valley College or the Computer Science program and any registered Imperial Valley College student may enroll in the program. Individuals over the age of 18 are eligible to enroll at the college

and participate in the Computer Science program and no "special" fees exist. Prerequisite satisfaction is the only criteria that must be met in order to enroll in program courses.

Appendix

Course Outlines

Computer Science

Associate of Science Degree Program

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics and Engineering **DATE:** October 2007

COURSE TITLE: Introduction to Object-Oriented Programming Using Java **COURSE NO.:** CS 220 **UNITS:** 4.0

LEC HRS. 3 **LAB HRS.** 3 **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

This course provides an introduction to object-oriented programming using the Java programming language. Topics included (but not limited to) in this course are fundamentals of structured computer programming, primitive data types, expressions, control statements, methods, arrays, searching, sorting, and debugging. Emphasis is on learning through hands-on programming exercises.

II. A. PREREQUISITES, if any:

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

MATH 090 or equivalent, and CIS 202 or CIS 204 or CIS 208 or equivalent with a grade of C or better.

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

Student will be able to:

1. Understand computer basics, programs, operating systems, compilers, interpreters, linkers, and the program development cycle.

2. Understand how the computer represents numerical and character data types, be able to convert between binary, decimal and hexadecimal, and convert between unicode characters and hexadecimal.

3. Identify and describe the significance of the major parts of a Java program; correctly state the range of values of each Java primitive data type, describe the result of applying each of the various Java arithmetic, logical and relational operators to operands of various types, and correctly predict the value of complex Java arithmetic, logical and relational expressions.

4. Design, code, and test a complete Java program that correctly employs sequential, conditional and iterative control constructs to satisfy the program's functional specification.

5. Design, code, and test a complete Java program that correctly declares, instantiates, and manipulates the elements of one-dimensional arrays, two -dimensional arrays, and Vectors to satisfy the program's functional specification.

6. Write a complete Java program that employs linear search and binary search to search a static array.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

	CORE CONTENT	APPROX. % OF COURSE
1.	Introduction to Computers, Programs, and Java A. Overview of computer systems B. Number systems C. Create, compile, and run Java programs	15%
2.	Primitive Data Types and Operations A. Identifiers B. Variables C. Constants D. Numeric types and expressions E. Debugging	10%
3.	Selection Statements A. Conditional statements B. Boolean types C. Operator precedence	10%
4.	Loops A. while B. do-while C. for D. Nested loops E. break and continue	20%
5.	Methods A. Method design B. Parameter passing C. Math methods D. Refinement	20%
6.	Arrays A. Linear search B. Binary search C. Selection sort D. Insertion sort E. Two-dimensional arrays	25%
TOTAL		**100%**

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	**Simulation/** X	**Case Study**	X
On-Line	X				

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit.

Other X

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Deitel, H. M., and P. J. Deitel. *Java How To Program* 6th Edition. Prentice Hall.

Eckel, B. *Thinking in Java.* 3rd Edition. Prentice Hall.

Gaddis, T. *Starting Out With Java 5 – Early Objects*. Addison Wesley.

Horton. *Beginning* Java 2 JDK. 5th Edition. Wrox.

Kalin, M. *Object Oriented Programming in Java*. Prentice Hall.

Liang, D. Y. *Introduction to Java Programming: Fundamentals First, 6th Edition*. Prentice Hall, 2007.

Savitch. *Absolute Java.* 2nd Edition. Addison Wesley.

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics, and Engineering **DATE:** October 2007

COURSE TITLE: Intermediate Object-Oriented Programming Using Java **COURSE NO.:** CS 230 **UNITS:** 4.0

LEC HRS. 3 **LAB HRS.** 3 **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE** _____

I. COURSE/CATALOG DESCRIPTION:

This course provides an intermediate treatment of object-oriented programming using the Java programming language. Topics included (but not limited to) in this course are abstract classes, inheritance, polymorphism, interfaces, graphical user interfaces (GUI), graphics, event-driven programming, exception handling, file input, file output, and applets. Emphasis is on learning through hands-on programming exercises.

II. A. PREREQUISITES, if any:

CS 220 or equivalent with a grade of "C" or better.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

Student will be able to:

1. Design a new class and implement the class as a part of a complete Java program that declares and defines the class, instantiates objects of the class, and invokes instance and static methods of the class to satisfy the program's functional specification.

2. Design, code, and test a complete Java program that performs a simple text -processing task by correctly employing text file input/output and correctly instantiating and manipulating objects of the Character, String and StringBuffer classes and at least one numeric wrapper class.

3. Design, code, and test a complete Java program that correctly employs inheritance and polymorphism, by implementing a class hierarchy of superclasses and subclasses, and polymorphic invocation of their respective methods to satisfy the program's functional specification.

4. Design, code, and test a complete Java program that correctly employs abstract classes, abstract methods, and interfaces to satisfy the program's functional specification.

5. Design systems by identifying the relationships among them and design classes using the class-design guidelines.

6. Write a complete Java program that employs a GUI and graphics to satisfy its functional specification.

7. Write a complete Java program that implements the Graphics class, the paintComponent method, panels as canvases, incorporates strings, lines, rectangles, ovals, arcs, and polygons, and displays images in a GUI component.

8. Write a complete Java program that declares listener classes and inner classes, registers listener objects, and deals with ActionEvent, MouseEvent, and KeyEvent.

9. Create a GUI using components including JButton, JCheckBox, JRadioButton, JLabel, JTextField, JTextArea, JComboBox, JList, JScrollBar, and JSlider.

10. Develop applets using init, start, stop, and destroy methods in the Applet class, embed the applet in Web pages, and run the applets from a viewer and a browser.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

	CORE CONTENT	APPROX. % OF COURSE
1.	Objects and Classes A. Classes B. Constructors C. Reference variables D. Static variables, constants, and methods E. Data field encapsulation F. Immutable objects and classes G. Passing objects to methods H. Scope of variables I. this Keyword J. Array of objects K. Class abstraction and encapsulation	20%
2.	Strings and Text I/O A. String class B. Character class C. StringBuilder / StringBuffer class D. Command-line arguments E. File class F. Text I/O	10%
3.	Inheritance and Polymorphism A. Superclasses and subclasses B. super Keyword C. Overriding methods D. Object class and toString() method E. Polymorphism, dynamic binding, and generic programming F. Casting objects G. ArrayList class H. A custom stack class I. final Classes, Methods, and variables	10%
4.	Abstract Classes and Interfaces A. Abstract classes B. Calendar and GregorianCalendar classes C. Interfaces D. Processing primitive data type values as objects E. Automatic conversion between primitive types and wrapper class types	10%
5.	Object-Oriented Design A. Software development process B. Discovering Class relationships	10%
6.	GUI Basics A. GUI components B. Java GUI API C. Frames and Layout managers D. Color class and Font class E. Using panels as subcontainers F. Common features of Swing GUI components G. Image icons	10%
7.	Graphics A. Graphical coordinate systems B. Graphics class C. paintComponent method D. Drawing graphics on panels E. Drawing strings, lines, rectangles, ovals, and arcs F. Polygon class and drawing polygons and polylines G. Centering a display using FontMetrics class	10%
8.	Event-Driven Programming A. Event and Event Source B. Listeners, Registrations, and Handling Events C. Mouse Events D. Key Events	10%

9.	Creating User Interfaces A. Buttons and Radio buttons B. Check boxes C. Labels D. Text fields and areas E. Combo boxes F. Lists G. Scroll bars and sliders H. Creating multiple windows	5%
10.	Applets and Multimedia A. Applet class B. JApplet class C. HTML File and the <applet> tag D. Enabling applets to run as applications E. Passing strings to applets	5%
TOTAL		**100%**

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	**Simulation/** X	**Case Study**	X
On-Line	X				

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____

Other X

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Deitel, H. M., and P. J. Deitel. *Java How To Program* 6th Edition. Prentice Hall.

Eckel, B. *Thinking in Java.* 3rd Edition. Prentice Hall.

Gaddis, T. *Starting Out With Java 5 – Early Objects*. Addison Wesley.

Horton. *Beginning* Java 2 JDK. 5th Edition. Wrox.

Kalin, M. *Object Oriented Programming in Java.* Prentice Hall.

Liang, D. Y. *Introduction to Java Programming: Fundamentals First, 6th Edition*. Prentice Hall, 2007.

Savitch. *Absolute Java.* 2nd Edition. Addison Wesley.

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics, and Engineering **DATE:** October 2007

COURSE TITLE: Assembly Language and Machine Organization **COURSE NO.:** CS 280 **UNITS:** 4.0

LEC HRS. 3 **LAB HRS.** 3 **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

A course covering general concepts of internal organization of a computer a, machine and assembly language Topics include number system and data representation, primitive instructions and operations, program execution, addressing techniques, arrays, subroutines, macros, recursion, virtual memory, cache memory interrupt handling, and memory management..

II. A. PREREQUISITES, if any:

CS 230 or equivalent and MATH 090 or equivalent with a grade of "C" or better.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

Student will be able to:

1. Correctly describe the internal binary representation of base 10 integer and real values, character values, and logical values.

2. Describe nature and role of the system bus, channels, controllers, interfaces, direct memory access (DMA), cache memory, real memory and virtual memory.

3. Demonstrate an understanding of all steps involved in the assembly language programming process by writing/editing, assembling, compiling, linking and loading a simple assembly language program.

4. Demonstrate an understanding of addressing modes by writing/editing, assembling, compiling, linking and loading a simple assembly language program that employs a variety of addressing modes to reference stored scalar variables and array elements.

5. Demonstrate an understanding of assembly language flow control concepts by writing/editing, assembling, compiling, linking and loading a simple assembly language program that contains branching and looping constructs.

6. Demonstrate an understanding of assembly language subroutines and macros by writing/editing, assembling, compiling, linking and loading a simple assembly language program that contains and invokes procedures, functions, and macros.

7. Demonstrate an understanding of recursion by writing/editing, assembling, compiling, linking and loading a simple assembly language program that implements a recursive algorithm using one or more stacks.

8. Demonstrate an understanding of interrupts and interrupt handling by writing/editing, assembling, compiling, linking and loading a simple assembly language program that detects and services an interrupt.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE
(1) Data Representation and Mathematical Preliminaries A. Binary and hexadecimal representation of integers. B. One's complement and two's complement representation of signed integers. C. Arithmetic operations on integer operands in base 2 and base 16. D. Integer overflow and underflow. E. Floating point representation of real-valued data. F. Representation of character data: ASCII and Unicode.	10%
(2) Introduction to Machine Organization A. The CPU. B. The system bus. C. Memory (ROM and RAM): memory buses; primary and secondary cache memory; DMA. D. Peripheral devices: controllers; channels; interfaces.	15%
(3) The Assembly Language Programming Process A. Fundamental machine-level instructions and the general structure of assembly language programs. B. Assemblers and the assembly process. C. Compilers and the compilation process. D. Linkers and the linking process. E. Loaders and the loading process. F. Introduction to the BSVC microprocessor simulation environment.	15%
(4) Storage Allocation and Memory Management A. Addressing modes. B. Real, expanded and virtual memory. C. Dynamic address translation. D. Arrays and additional addressing modes.	15%
(5) Flow Control A. Flow control in assembler. B. The Status Register and Condition Code Register. B. If/else/case statements. C. For/do/while loops. D. Signed and unsigned branches E. Shift operations and bit operations.	10%
(6) Subprograms & Macros A. Procedures and functions. B. The run-time stack. C. Parameter passing protocols. D. Saving and restoring the program state; stack frames. E. Calling assembly language subroutines from higher-level languages. F. Macros; macros versus subroutines.	15%
(7) Recursion A. Recursion and recursive algorithms. B. Stacks and recursion. C. Implementing recursive subroutines in assembly language.	10%
(8) Interrupt Handling A. Interrupts. B. Interrupt vector tables. C. Traps.	10%
Total	**100%**

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	X	**Simulation/ Case Study**	X
On-Line	X				

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____

Other X

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Ford & Topp, *Assembly Language and Systems Programming for the M68000 Family (2nd)*, Jones and Bartlett.

Riggins, A., *BSVC Manual and Supplementary Materials*, open source (available from the author; ariggins@sciences.sdsu.edu).

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics, and Engineering **DATE:** September 2007

COURSE TITLE: Elementary Statistics **COURSE NO.:** MATH 119 **UNITS:** 4

LEC HRS. 4 **LAB HRS.** _____ **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

Graphical representation of statistical data, calculations, and uses of various averages, measures of variability, introduction to probability, probability distributions, confidence intervals, sample size determination and hypothesis testing, ANOVA, linear regression and Chi-square analysis. Students will learn to use technology to find confidence intervals, test statistics, regression lines, and to produce graphics. This course also provides supervised practice in the appropriate use of technology designed to assist students in calculations required in beginning statistics.

II. A. PREREQUISITES, if any:

MATH 090 with a grade of "C" or better, or appropriate placement.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

ENGL 101 or ENGL 111

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. The student will distinguish the various ways of organizing, displaying, and measuring data.

2. The student will derive the numerical relationship that exists between bivariate data sets.

3. The student will demonstrate an understanding of the theory of probability and proficiency in solving problems of this nature.

4. The student will compute and interpret expected values and variance, and learn about the binomial distribution for discrete random variables.

5. The student will compute and interpret expected values and variance, and learn about the normal distribution for continuous random variables.

6. The student will examine the joint probability structure of two or more random variables and understand the limiting behavior of the sum of independent random variables as the number of the sample becomes larger.

7. The student will use the various types of distributions that are derived from the normal distribution.

8. The student will calculate and interpret confidence intervals for a population mean to show how probability connects to this type of statistical inference.

9. The student will use hypothesis testing as a formal means of distinguishing between probability distributions on the basis of random variables generated from one of the distributions.

10. The student will compare the means of the data from experiments involving more than two samples, including the single factor analysis of variance (ANOVA).

11. The student will fit a straight line to the given data in graphical form.

12. The student will make use of Chi-square distributions to analyze counts.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

	CORE CONTENT	APPROX. % OF COURSE
1.	Introduction and descriptive statistics A. An overview of statistics B. Pictorial and tabular methods in statistics C. Measures of location D. Measures of variability	10%
2.	Bivariate data analysis A. Displaying bivariate data B. Correlation coefficient C. Least squares line	5%
3.	Probability A. Sample spaces and events B. Axioms C. Interpretations D. Properties of probability E. Computing probabilities F. Conditional probability G. Independence	10%
4.	Discrete random variables A. Random variables B. Probability distributions C. Expected values D. Variance and standard deviation E. The binomial distribution F. The Hypergeometric distribution	10%
5.	Continuous random variables A. Probability distributions B. The Uniform distribution C. The Normal distribution	5%
6.	Joint probability distribution and random samples A. Jointly distributed random variables B. Expected values C. Covariance and correlation D. The Central Limit Theorem E. Sums and averages F. Simple random sampling	10%
7.	Distributions derived from the normal distribution A. Chi-square distribution B. The T- distribution and F-distribution	10%
8.	Interval estimation A. Confidence intervals for a mean of normal populations B. Confidence intervals for population proportions C. Large-sample intervals for population means D. Small-sample intervals for means of normal population	10%
9.	Hypothesis testing A. Tests about the mean of a normal population B. Large-sample tests for a population mean C. Large-sample tests for population proportions D. The t-test E. Tests for differences between two population means F. Tests about means from matched pairs G. Type I and type II errors	10%
10.	The single factor analysis of variance (ANOVA)	5%
11.	Linear regression A. Statistical properties of the estimated slope and intercept B. Assessing the fit C. Correlation and regression	5%
12.	Analysis of counts A. Chi-square test of independence B. Chi-square test of homogeneity C. Goodness of fit	10%
TOTAL		**100%**

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	**Simulation/** X	**Case Study**	X

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____

Other X

Online X

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Triola, Mario. *Elementary Statistics,* 10th edition. Addison-Wesley, 2006.

Triola, Mario. *Essentials of Statistics*, 3rd Edition. Addison-Wesley, 2006.

Brase and Brase. *Understandable Statistics Concepts and Methods*, 8th Edition. Houghton-Mifflin, 2006.

Gravetter, Frederick J. and Larry B. Wallnau. *Essentials of Statistics for the Behavioral Sciences.* Wadsworth Publishers, 2005.

Moore, David S. *The Basic Practice of Statistics*, 4th Edition. W. H. Freeman and Company, 2007.

Software as needed: *Microsoft Excel, Minitab, Fathom, StatDisk, or Graphing Calculators*

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics and Engineering **DATE:** September 2006

COURSE TITLE: Calculus I **COURSE NO.:** MATH 192 **UNITS:** 5

LEC HRS. 5 **LAB HRS.** _____ **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

Concepts dealing with limits, continuity, differentiation and applications, integration and applications, exponential and logarithmic functions, and other transcendental functions will be covered.

II. A. PREREQUISITES, if any:

MATH 190 or equivalent with a grade of "C" or better, or appropriate placement.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. The student will demonstrate skills in understanding the concept of limit and be knowledgeable in finding limits.

2. The student will demonstrate an understanding and a working knowledge of the derivative.

3. The student will demonstrate proficiency in problem solving when dealing with applications of differentiation.

4. The student will demonstrate knowledge in anti-differentiation.

5. The student will demonstrate an understanding and a working knowledge of the definite integral.

6. The student will demonstrate a thorough understanding of logarithmic and exponential functions, and their use in applications dealing primarily with growth and decay phenomena.

7. The students will demonstrate the ability to deal with trigonometric, inverse trigonometric and hyperbolic functions and many common applications thereof.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE
1. Limits A. Tangents, areas and limits B. Limits of functions C. The formal definition of limit D. Properties of limits E. One-sided limits F. Continuity	15%
2. The Derivative A. The derivative as a function B. Rules of calculating derivatives C. Derivatives of the trigonometric functions D. The derivative as a velocity E. Higher order derivatives F. The chain rule G. Implicit differentiation and rational power functions H. Linear approximation and differentials I. Newton's method	15%
3. Applications of the Derivative A. Extreme values and the Mean Value Theorem B. Increasing and decreasing functions C. Relative Extrema D. Significance of the Second Derivative Concavity E. Curve sketching F. Extrema on closed Bounded Intervals; max-min problems G. The derivative as a rate of change	15%
4. Anti-differentiation A. Anti-derivatives B. Integrals by substitution C. Differential equations	10%
5. The Definite Integral A. Review of Sigma Notation B. The Area Problem: Approximating Sums C. Reimann Sums: The Definite Integral D. The Fundamental Theorem of Calculus E. Finding Areas by Integration F. Rules of Approximating Integrals	15%
6. Logarithmic and Exponential Functions A. Review of Logarithms and Inverse Functions B. The Natural Logarithm Function C. The Natural Exponential Function D. Exponentials and Logs to other bases E. Exponential growth and decay	15%
7. Trigonometric, Inverse Trigonometric and Hyperbolic Functions A. Integrals of the Trigonometric Functions B. Integrals involving products of Trigonometric Functions C. The Inverse Trigonometric Functions D. Derivatives of the Inverse Trigonometric Functions E. The Hyperbolic Functions	15%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	**Simulation/** X	**Case Study**	X
On-Line	X				

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____

Other

VIII. REQUIRED AND MAJOR OPTIONAL READING(S), INCLUDING TEXTBOOK(S) AND SOFTWARE

Larson, R., Hostetler, R. and Edwards, B. *Calculus of a Single Variable*. 8th edition. Houghton Mifflin , 2005.

Stewart, James. *Calculus*. 5th edition. Brooks/Cole, 2003.

Stewart, James. *Single Variable Calculus: Early Transcendentals*. 5th edition. Brooks/Cole, 2003.

Edwards, C. and Penney, D. *Calculus, Early Transcendentals*. 6th edition. Prentice Hall , 2003.

Strauss, M., Bradley, G. and Smith,K. *Single Variable Calculus*. 3rd edition. Prentice Hall , 2002.

Technology: Graphing Calculators

Journals: *Math Teacher*, NCTM
The College Mathematics Journal, MA

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics and Engineering **DATE:** September 2006

COURSE TITLE: Calculus II **COURSE NO.:** MATH 194

UNITS: 5

LEC HRS. 5 **LAB HRS.** _____ **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

Concepts dealing with integration applications, methods of integration, infinite series, plane analytic geometry, parametric equations, and polar coordinates.

II. A. PREREQUISITES, if any:

MATH 192 with a grade of "C" or better.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. The student will demonstrate the ability to solve many problems in diverse areas, in a step-by-step manner, when dealing with applications of integration.

2. The student will demonstrate knowledge and understanding of various methods used in mathematical integrations.

3. The student will be introduced to various indeterminate forms and be able to evaluate improper integrals.

4. The student will recognize infinite sequences and infinite series and will apply various tests for convergence determination.

5. The student will demonstrate knowledge in series expansion and the concept of power series.

6. The student will learn and distinguish the various types of conic sections.

7. The student will demonstrate knowledge of the polar system of coordinates and its use in applications.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE
1. Applications of the definite integral A. Calculating volumes by slicing B. Calculating volumes by the method of cylindrical shells C. Arc length and surface area D. Distance and velocity E. Hydrostatic pressure F. Work G. Moments and centers of gravity H. The Theorems of Pappus	25%
2. Techniques of integration A. Integration by parts B. Trigonometric substitutions C. Integrals involving quadratic expressions D. The method of partial fractions E. Miscellaneous substitutions F. The use of integral tables	15%
3. l'Hopital's Rule and Improper Integrals A. Indeterminate forms: l'Hopitals Rule B. Other indeterminate forms C. Improper integrals	10%
4. The Theory of Infinite Series A. Infinite sequences B. More on infinite sequences C. Infinite series D. The integral test E. The comparison test F. The ratio and root tests G. Absolute and conditional convergence	15%
5. Taylor Polynomials and Power Series A. The approximation problem and Taylor polynomials B. Taylor's Theorem C. Applications of Taylor's Theorem D. Power series E. Differentiation and Integration of Power Series F. Taylor and Maclaurin series	10%
6. The Conic sections A. The Parabola B. The Ellipse C. The Hyperbola D. Rotation of Axes	10%
7. Polar Coordinates and Parametric Equations A. The polar system coordinates B. Graphing techniques for polar equations C. Calculating area in polar coordinates D. Parametric equations	15%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	**Simulation/** X	**Case Study**	X
On-Line	X				

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____

Other

VII. REQUIRED AND MAJOR OPTIONAL READING(S), INCLUDING TEXTBOOK(S) AND SOFTWARE

Larson, R., Hostetler, R. and Edwards, B. *Calculus of a Single Variable*. 8th edition. Houghton Mifflin, 2006.

Stewart, James. *Calculus*. 5th edition. Brooks/Cole, 2003.

Stewart, James. *Single Variable Calculus: Early Transcendentals*. 5th edition. Brooks/Cole, 2003.

Edwards, C. and Penney, D. *Calculus, Early Transcendentals*. 6th edition. Prentice Hall, 2003.

Strauss, M., Bradley, G. and Smith, K. *Single Variable Calculus*. 3rd edition. Prentice Hall, 2002.

Technology: Graphing Calculators

Journals: *Math Teacher*, NCTM
The College Mathematics Journal, MAA

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics and Engineering **DATE:** September 2006

COURSE TITLE: Introduction to Linear Algebra with Applications **COURSE NO.:** MATH 230 **UNITS:** 3

LEC HRS. 3 **LAB HRS.** _____ **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

A first course in linear algebra intended for students majoring in mathematics, the physical science, engineering or business. Topics included are: systems of linear equations, matrices and determinants, vector spaces, linear transformations, eigenvalues and eigenvectors, and selected applications.

II. A. PREREQUISITES, if any:

MATH 194 with a grade of C or better.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. The student will solve systems of linear equations and inequalities using elimination methods.

2. The student will apply the techniques of matrix algebra to the solution of systems of linear equations and inequalities.

3. The student will compute the determinant of a square matrix and apply determinants to matrix operations.

4. The student will perform vector operations in tow or more dimensions and determine vector linear relationships, matrix dimension and rank.

5. The student will find the projection of vectors on planes in space using matrices and the Gram-Schmidt process.

6. The student will demonstrate the transformations of linear systems and find the kernel and range of such transformations.

7. The student will compute the scalar eigenvalue and eigenvector of a square matrix and diagonalize square matrices.

8. The student will choose appropriate techniques of linear algebra to solve application problems from different fields.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE
1. Linear Systems A. Systems of linear equations and inequalities B. Various methods of solutions	5%
2. Matrices A. Definitions B. Properties C. Operations	10%
3. Determinants A. Definitions B. Properties C. Operations	10%
4. Vector Spaces A. Definitions B. Properties C. Operations D. Linear relationships E. Matrix dimension and rank	20%
5. Inner-product spaces A. Orthogonality B. Projections of vectors	10%
6. Linear Transformations A. Definitions and types B. Kernal and range	10%
7. Eigenvalues and eigenvectors of matrices A. Definitions B. Properties C. Diagonalization of a matrix	15%
8. Selected applications from various fields to be presented throughout the course content	20%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	**Simulation/** X	**Case Study**	X
On-Line	X				

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____

Other

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Lay, David. *Linear Algebra and Its Applications*. 3rd edition. Addison Wesley, 2006.

Larson, R. and Edward, B. *Elementary Linear Algebra.* 4th edition. Houghton Mifflin, 2000.

Kolman, B.and Hill, D. *Introductory Linear Algebra: An Applied First Course.* 8th edition. Prentice Hall, 2005.

Strang, Gilbert. *Linear Algebra and Its Applications*. 4th edition. Brooks/Cole, 2006.

Leon, Steven. *Linear Algebra with Applications*. 7th edition. Prentice Hall, 2006.

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics, and Engineering **DATE**: September 2006

COURSE TITLE: Discrete Mathematics **COURSE NO.**: MATH 240 **UNITS**: 3

LEC HRS: 3 **LAB HRS**: _____ **HRS. TBA**: _____.

If cross-referenced, please complete the following:

COURSE NO.(s): _____. **COURSE TITLE**: _____.

I. COURSE/CATALOG DESCRIPTION:

This course is an introduction to the theory of discrete mathematics and introduces elementary concepts in logic, set theory, graph theory, number theory and combinatorics. This forms a basis for upper division courses in mathematics and computer science, and is intended for the transfer student planning to major in these disciplines. The topics covered in this course include methods of proof, sets and relations, number theory, induction, recursion, counting principles, permutations, combinations, and graph theory.

II. A. PREREQUISITES, IF ANY:

MATH 192 with a grade "C" or better.

B. CO-REQUISITES, IF ANY:

None

C. RECOMMENDED PREPARATION, IF ANY:

None

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. The student will use proof techniques in logic to determine the validity of logic statements.

2. The student will solve problems in which the number of possibilities is finite using basic counting techniques, permutations and combinations.

3. The student will demonstrate an understanding of the concept of sets and the ability to carry out set operations.

4. The student will demonstrate an understanding of number theory as it applies to finite sets.

5. The student will solve recurrence relations.

6. The student will demonstrate an understanding of introductory graph theory with its application to real-life problems.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

	CORE CONTENT	APPROX % OF COURSE
1.	Logic A. Compound statements B. Proofs C. Truth tables D. Logical arguments	15%
2.	Principles of Counting A. Inclusion-Exclusion B. Addition and Multiplication rules C. Pigeon-Hole principle D. Permutations E. Combinations F. Binomial theorem	20%
3.	Set Theory A. Sets B. Operations on sets C. Binary relations D. Equivalence relations E. Partial orders	15%
4.	Number Theory A. Mapping B. Inverses and composition C. One-to-One correspondence and the cardinality of a set D. Division algorithm E. Divisibility and the Euclidean algorithm F. Prime numbers G. Congruence and its applications	20%
5.	Recursion A. Mathematical induction B. Recursively defined sequences C. Characteristic polynomial D. Generating functions	15%
6.	Graph Theory A. Definitions and basic properties B. Isomorphism C. Eulerian circuits D. Hamiltonian cycles	15%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (Check all that apply.)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other					

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply.)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	**Simulation/** X	**Case Study**	X
On-Line	X				

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit.

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Epp, Susanna, *Discrete Mathematics with Applications*. 3rd Edition Brooks/Cole, 2004.

Goodaire and Parmenter, *Discrete Mathematics with Graph Theory*. 2nd Edition Prentice Hall, Upper Saddle River, N.J., 2002.

Grimaldi, Ralph, *Discrete Mathematics and Combinatorial Mathematics*. 5th Edition Addison Wesley, 2004.

Dossey, Otto, Spence, and Vanden Eynden, *Discrete Mathematics*. 5th Edition Addison Wesley, 2006.

Johnsonbaugh, Richard, *Discrete Mathematics*. 6th Edition Prentice Hall, 2005.

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE-OF-RECORD

DIVISION: Science, Math, and Engineering **DATE:** 10/11/06

COURSE TITLE: General Biology: Molecules, Cells, and Genetics **COURSE NO.:** BIOL 180
UNITS: 4

LEC HRS. 3 **LAB HRS.** 3 **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) COURSE TITLE

I. COURSE/CATALOG DESCRIPTION:

This is one of two entry-level courses designed for life science majors, health care, and science educators intending to transfer to four-year institutions. However, the course is open to all students. This course will introduce students to molecules of cells, cell structures and functions, cell division, cellular respiration, photosynthesis, molecular biology, and genetics.

II. A. PREREQUISITES, if any:

MATH 090 with a grade of "C" or better.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.
___ Course may be taken on a "credit" basis or for a letter grade.
___ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

Student will be able to:

1. Understand the basic concepts of biology and explain and use the scientific method.
2. Describe the structure of atoms, and understand why chemical bonds form.
3. Explain the important properties of water molecules and carbon atoms for life.
4. Describe the different macromolecules in living organisms, and give examples of each type.
5. Understand the functions of cell organelles.
6. Explain the functions of the cell membrane.
7. Describe metabolism, and understand how enzymes assist in chemical reactions.
8. Explain the processes of cellular respiration and photosynthesis.
9. Understand the processes of cell communication.
10. Describe the processes of mitosis and meiosis, and how they are regulated.
11. Explain Mendelian inheritance, give examples of inheritance patterns, and work problems dealing with basic Mendelian genetics.
12. Describe chromosome structure and function, including DNA replication and repair, and give examples of genetic diseases at the chromosomal level.
13. Understand the processes of transcription and translation, and how DNA mutations cause changes in protein sequences.
14. Discuss modern DNA technologies, and their importance in life.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE
1. Science and Scientific Method A. Biological organization B. Scientific names C. Scientific method	4%
2. Atomic Structure A. Atoms B. Chemical bonds C. Chemical reactions	5%
3. Water and Carbon A. Properties of water B. pH C. Properties of carbon D. Functional groups	5%
4. Macromolecules A. Monomers and polymers B. Carbohydrates C. Lipids D. Proteins E. Nucleic acids	5%
5. Cell Structure and Function A. Nucleus B. Endomembrane system C. Mitochondria and chloroplasts D. Cytoskeleton E. Extracellular components	10%
6. Membrane Structure and Function A. Membrane composition B. Permeability C. Passive transport D. Active transport	5%
7. Metabolism A. Energy B. ATP C. Enzymes D. Enzyme activity	5%

8. Respiration and Photosynthesis A. Glycolysis B. Citric Acid Cycle C. Electron Transport Chain D. Fermentation E. Light reactions F. Calvin Cycle	10%
9. Cell Communication A. Cell signals B. Receptors C. Signal transduction D. Response	7%
10. Cell Division A. Mitosis B. Control of mitosis C. Meiosis	10%
11. Mendelian Inheritance A. Mendel's experiments B. Single-gene (Mendelian) inheritance C. Non-Mendelian inheritance D. Patterns of inheritance	10%
12. Chromosomes A. Chromosome structure B. X chromosome function C. Linkage D. DNA replication E. DNA repair F. Alterations of chromosome numbers and structure	10%
13. Transcription and Translation A. Transcription B. Genetic code C. Translation D. DNA mutations	7%
14. DNA Technology A. DNA cloning B. Genome mapping C. DNA sequencing D. Human Genome Project E. Applications	7%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	X	**Simulation/ Case Study**	X
On-Line	X				

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. ____

Other X

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Campbell, Neil A., and Reece, Jane B. *Biology.* 7th edition. San Francisco: Pearson/Benjamin Cummings, 2005.

Morgan, Judith G., and Carter, M. Eloise Brown. *Investigating Biology Lab Manual.* 5th edition. San Francisco: Pearson/Benjamin Cummings, 2005.

Waterman, Margaret, and Stanley, Ethel. *Biological Inquiry: A Workbook of Investigative Cases.* 7th edition. San Francisco: Pearson/Benjamin Cummings, 2005.

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE-OF-RECORD

DIVISION: Division of Science, Math, and Engineering **DATE:** September 25, 2006

COURSE TITLE: General Biology: Principles of Organismal Biology **COURSE NO.:** BIOL 182 **UNITS:** 4

LEC HRS. 3 **LAB HRS.** 3 **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _ **COURSE TITLE**

I. **COURSE/CATALOG DESCRIPTION:** This is one of two entry-level courses designed for life science, biology, health care, and science education majors intending to transfer to four-year institutions. However, this course is open to all students. This course provides students an introduction to biology and the scientific method. Additionally, properties of life leading to genetic and biological diversity are studied. The course surveys evolutionary relationships, systematics, ecology, biological diversity, population regulation, and physiology of living organisms (Protista, Fungi, Plants, and Animals). Emphasis is on structure and function at the organismal level.

II. A. **PREREQUISITES, if any:** Math 90 with a C or better

B. **COREQUISITES, if any:**

C. **RECOMMENDED PREPARATION, if any:**

III. **GRADING CRITERIA:**

X Course must be taken on a "letter-grade" basis only.
_____ Course may be taken on a "credit" basis or for a letter grade.
_____ Course must be taken on a "credit" basis only.

IV. **MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":**

Student will be able to:

1. Describe the biological characteristics of life, and demonstrate an understanding of cells, and levels of biological organization.
2. Understand the process of science and demonstrate an ability to test hypotheses.
3. Define biological evolution, and demonstrate an understanding of how genetic variation and natural selection influence biological diversity.
4. Define what plants are, and provide evidence of an understanding of plant evolution, development, structure, growth, reproduction, and selected physiological processes.
5. Describe what Fungi are, and provide evidence of an understanding of development, structure, growth, and reproduction within this phylum.
6. Define what Protists are, and provide evidence of an understanding of their characteristics, structure, diversity, and reproduction.
7. Demonstrate an understanding of animal diversity, ecology and evolutionary trends.
8. Demonstrate an understanding of animal form and function including physiological processes, development, and reproduction across phyla.
9. Demonstrate an understanding of animal nervous systems from the cellular level to integrated systems.

10. Demonstrate an understanding of the structure of muscles, and the sliding filament model theory.
11. Understand animal sensory systems
12. Demonstrate an understanding of population growth and regulation.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE
1. What is life? A. Characteristics of life B. Cells C. Levels of biological organization	5%
2. The process of science A. Hypothesis testing B. Testable Predictions C. Experimentation D. Theories	12%
3. Biological Evolution A. Species concept B. Speciation C. Natural selection D. Micro- and macro-evolution E. Phylogeny and systematics	10%
4. Plant Biology A. Evolutionary trends in plants B. Plant development, structure, and growth C. Transport D. Nutrition E. Photosynthesis F. Reproduction G. Responses to stimuli	10%
5. Fungi A. Development, structure, growth B. Reproduction	7%
6. Protista A. Characteristics, structure, and diversity B. Reproduction	7%
7. Animal Diversity A. Animal characteristics and structure B. Evolutionary trends in animals C. Protostomes D. Deuterostomes E. Ecology	11%

8. Animal Form and Function A. Levels of organization B. Homeostasis C. Evolutionary trends in organ systems D. Digestion E. Gas Exchange F. Osmoregulation G. Endocrine system H. Development I. Reproduction	15%
9. Nervous systems A. Evolutionary trends across phyla B. Nerve structure C. Nerve Impulse D. Synapses E. The brain	7%
10. Muscle tissue A. Structure B. Sliding filament model C. Type of muscles	5%
11. Sensory systems A. Sensory receptors B. Comparisons among phyla	6%
12. Population growth A. Density independent and density dependent regulation B. Logistic and exponential growth C. Population dynamics D. Global human population	5%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**		**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	X	**Simulation/ Case Study**	X

On-Line: X

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____

Other:

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Campbell, Neil A., and Jane B. Reece. 2005. Biology, 7th edition. Pearson/Benjamin Cummings, San Francisco, California.

Solomon, E.P., L.R. Berg, and D.W. Martin. 2004. Biology, 7th Edition. Brooks/Cole Thompson Learning Publishing.

Raven. Peter, and George Johnson. Biology, 6th edition. 2002. McGraw Hill Higher Education.

Campbell, Neil, Jane Reece, Martha Taylor, and Eric Simon. 2005. Biology: Concepts and Connections, 5th edition. Benjamin Cummings Publishing.

Supplements:

Van De Graff, Kent M., and John L. Crawley. 2005. A photographic atlas for the Biology Laboratory 5th edition. Morton Publishing Company, Englewood, Colorado.

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics, and Engineering **DATE**: October 12, 2005

COURSE TITLE: General Inorganic Chemistry I **COURSE NO.**: CHEM 200 **UNITS**: 5

LEC HRS: 3 . **LAB HRS**: 6 . **HRS. TBA**: 0 .

If cross-referenced, please complete the following:

COURSE NO.(s): _____ **COURSE TITLE**: _____.

I. COURSE/CATALOG DESCRIPTION:

Basic principles and calculations of chemistry with emphasis on stoichiometry and dimensional analysis applied to various problem types. Fundamental principles and theory of atomic and molecular structure as related to bonding and molecular geometry. Study of kinetic molecular theory, the first law of thermodynamics, periodic relationships of the elements, physical states of matter, solution chemistry, and oxidation-reduction. The laboratory is closely related to lecture topics and includes methods of classical experimentation as well as certain types of instrumental analysis.

II. A. PREREQUISITES, IF ANY:

CHEM 100 with a grade of "C" or better.

B. CO-REQUISITES, IF ANY:

None.

C. RECOMMENDED PREPARATION, IF ANY:

MATH 090 with a grade of "C" or better.

III. GRADING CRITERIA:

X . Course must be taken on a "letter-grade" basis only.

_____. Course may be taken on a "credit" basis or for a letter grade.

_____. Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. Student will demonstrate ability to perform dimensional analysis calculations as they relate to problems involving percent composition and density.

2. Student will write chemical formulas, name inorganic compounds, and demonstrate a knowledge of basic atomic theory

3. Student will relate chemical equations and stoichiometry as they apply to the mole concept, molarity, and acid-base titrations. Student will derive formulas from percent composition.

4. Student will identify the basic types of chemical reactions including precipitation, neutralization, and oxidation-reduction.

5. Student will demonstrate knowledge of atomic structure and quantum mechanics and apply these concepts to the study of periodic properties of the elements.

6. Student will relate the general concepts of atomic structure to a study of ionic bonding.

7. Student will relate the general concepts of covalent bonding and molecular structure.

8. Student will demonstrate the first law of thermodynamics both in theoretical and practical contexts and apply the theory to the solution of Hess' Law.

9. Student will manipulate the various gas laws in both theory and practice to solve mathematical problems relating to the behavior of both ideal and non-ideal gases.

10. Student will describe the general properties of liquids and solids including intermolecular attractions and phase changes.

11. Student will relate the general properties of solutions and employ knowledge of concentration to explain colligative properties. Student will investigate the phenomenon of vapor pressure.

12. Student will demonstrate knowledge of computer-assisted methods of data acquisition, analysis, and presentation.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

	CORE CONTENT	APPROX % OF COURSE
1.	Dimensional analysis. 1. Significant Figures 2. Exponential Notation 3. Unit conversion 4. Density and percent composition	6%
2.	Basic Atomic Structure 1. Dalton's Laws 2. Subatomic particles 3. Isotopes and atomic mass 4. Inorganic nomenclature 5. Compounds and mixtures	9%
3.	Formulas, equations and the mole concept. 1. Balancing chemical equations 2. Avogadro's number and the mole 3. Stoichiometry calculations 4. Limiting Reactants and Yield Calculations 5. Percent composition and empirical formulas 6. Solution stoichiometry 7. Titration	9%
4.	Types of Chemical Reactions 1. Electrolytes and Net Ionic Equations 2. Solubility and Precipitation reactions 3. Neutralization 4. Oxidation-Reduction 5. Activity Series	7%
5.	Atomic Structure, Quantum Mechanics, and Periodicity 1. Electromagnetic Radiation and Atomic Spectra 2. Wave-Particle duality: Plank and de Broglie equations 3. Quantum Numbers 4. Orbital shapes and electron configuration 5. Electron spin 6. Atomic and ionic radii	9%
6.	Ionic Bonding 1. Ionization energy and electron affinity 2. Nature of the ionic bond 3. Octet Rule	3%
7.	Covalent Bonding and Molecular Structure 1. Nature of the covalent bond 2. Electronegativity and polar covalent bonds 3. Bond dissociation energies 4. Dot structures 5. Resonance and formal charge 6. Molecular Geometry: VSEPR and Valence Bond Theories 7. Orbital hybridization 8. Molecular Orbital Theory	10%

8.	Thermochemistry 1. Heat and Energy 2. First Law of Thermodynamics 3. Energy and Enthalpy 4. State functions and the thermodynamic standard state 5. Calorimetry and heat capacity 6. Hess's Law 7. Bond dissociation energies	8%
9.	Gases calculations 1. Laws of Boyle, Charles, Gay-Lussac, Avogadro, Graham and Dalton 2. Ideal Gas Equation 3. Gas stoichiometry 4. Kinetic Molecular Theory 5. Real Gases	8%
11.	Solution Properties 1. Units of concentration: molarity, molality, percent concentration, normality 2. Solubility 3. Colligative properties 4. Vapor Pressure and the Claperyon equation	8%
12.	Acid-Base equilibria 1. Arrhenius-Bronsted-Lewis concepts 2. pH 3. Strong acid-strong base vs. weak acid-weak base Common Ion 4. Buffer solutions 5. Titrations	12%
13.	Precipitation Reactions 1. Net ionic reactions 2. Solubilities of ionic compounds 3. Solubility equilibria 4. Precipitation reactions 5. Formation of complex ions	11%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (Check all that apply.)

Essay	X	Class Activity	X	Written Assignments	X
Problem Solving Exercise	X	Final Exam	X	Oral Assignments	
Skill Demonstration	X	Objective	X	Quizzes	X
Other					

INSTRUCTIONAL METHODOLOGY: (Check all that apply.)

Lecture	X	Discussion	X	Demonstration	X
Audio Visual	X	Group Activity	X	Lab Activity	X
Computer Assisted Instruction	X	Individual Assistance	X	Simulation/ Case Study	

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit.

VII. TEXTBOOK(S) AND SUPPLEMENT(S):

Kotz, John C., Treichel, Paul M. ***Chemistry and Chemical Reactivity.* 5th edition.** Brooks & Cole Publishing, 2003

McMurray, John and Robert C. Fay. Chemistry. 2nd ed. Upper Saddle River, NJ: Prentice-Hall. 1998

Wentworth, R.A.D. Experiments in General Chemistry. 5th ed. Boston: Houghton Mifflin Co. 1999.

Gammon, Steven D. et al. Interactive Chemistry Journey. Upper Saddle River, NJ: Prentice-Hall. 1998

Hein, Morris and Susan Arena. Foundations of College Chemistry. 10th ed. Pacific Grove, CA: Brooks/Cole Publishing Co. 1999.

Ebbing, Darell D. and Steven D. Gammon. General Chemistry. 6th ed. Boston: Houghton Mifflin Co. 1999.

Brown, William H. and Christopher S. Foote. Organic Chemistry. 2nd ed. Fort Worth, TX: Saunders College Publishing. 1998.

Stanitski, Conrad, ed. Chemistry in Context: Applying Chemistry to Society. 3rd ed. New York: McGraw Hill. 2000.

Balling, Robert C. The Heated Debate. San Francisco: Pacific Research Institute for Public Policy. 1992.

Baggot,Jim. The Meaning of Quantum Theory: A Guide to Students of Chemistry and Physics. Oxford, England: Oxford University Press. 1992.

Gribbin, John. In Search of Shrodinger's Cat: Quantum Physics and Reality. New York: Bantam Doubleday Dell Publishers. 1985.

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE
COURSE OUTLINE

DIVISION: Science, Mathematics, and Engineering **DATE:** October 12, 2005

COURSE TITLE: General Inorganic Chemistry II **COURSE NO.** CHEM 202 **UNITS:** 5

LEC HRS. 3 **LAB HRS.** 6 HRS. TBA 0

If cross-referenced, please complete the following

COURSE NO. (s) _____ COURSE TITLE _____

I. **COURSE/CATALOG DESCRIPTION:**

II. **A. PREREQUISITES, if any:**

CHEM 200 with a grade of "C" or better.

B. COREQUISITES, if any:

None

C. RECOMMENDED PREPARATION, if any:

MATH 090 with a grade of "C" or better

III. **GRADING CRITERIA:**

X Course must be taken on a "letter-grade" basis only

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

Student evaluation on the basis of daily preparation of assignments as well as spot quizzes on daily assignments. Class discussion on current lessons with student explanations to the class provides an interesting method of evaluation. The use of periodic examinations during the semester with a comprehensive final examination given at the end of the course. Evaluation of the precision nature and of the determinations being performed in the laboratory.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

	CORE CONTENT	APPROX % OF COURSE
1.	Bonding: Atomic orbital and Molecular orbitals 1. sigma bonding 2. hybrid orbitals 3. multiply bonding 4. bonding and anti bonding 5. paramagnatism 6. metallic bonding	13%
2.	Organic Chemistry 1. Addition reactions 2. Markovnikov's Rule 3. Hybridization 4. Functional Groups 5. Elimination and substitution reactions 6. amino acids and protiens	13%
3.	Thermodynamics 1. Spontaneity and maximum useful work 2. Free energy, G 3. 1st law 4. 2nd law 5. 3rd law 6. Entropy change, S	15%
4.	Chemical Kinetics 1. Concentration Dependence 2. Determining Rate 3. Determining Rate Law 4. Arrhenius Equation 5. Dependence on temperature 6. Identify Reaction Mechanism 7. Reaction Mechanism and Rate Equation 8. Catalyst	15%
5.	Oxidation-reduction reactions 1. Balancing red-ox reactions 2. Electrolytic cells, Nernst equation 3. Spontaneity of reactions	12%
6.	Nuclear Reactions 1. Natural radioactivity 2. Artificial radioactivity 3. Rate of decay 4. Fission vs. fusion	8%
7.	Liquids, Solids, and Phase Changes 1. Intermolecular Forces 2. Phase Changes 3. Crystalline solids and unit cell calculations 4. Phase Diagrams	9%
8.	Survey of Elements 1. Main Group 2. Industrial preparation of Nitric acid using Ostwald process, chlorine 3. Ozone chemistry 4. Transition Elements 5. Occurance 6. Industrial preparation of aluminum, sodium, iron, copper 7. Coordination chemistry 8. Ligands 9. Naming coordination compounds 10. Isomers, Optical 11. Crystal Field Theory 12. Colors	15%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	Class Activity	X	Written Assignments	X
Problem Solving Exercise	X	Final Exam	X	Oral Assignments	
Skill Demonstration	X	Objective	X	Quizzes	X
Other					

VII. INSTRUCTIONAL METHODOLOGY: (check all that apply)

Lecture	X	Discussion	X	Demonstration	X
Audio Visual	X	Group Activity	X	Lab Activity	X
Computer Assisted Instruction	X	Individual Assistance	X	Simulation/ Case Study	

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit.

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Refer to the current textbook list and syllabi.

Kotz, John C., Treichel, Paul M. Chemistry and Chemical Reactivity. 5th edition. Brooks & Cole Publishing, 2003

McMurray, John and Robert C. Fay. Chemistry. 2nd ed. Upper Saddle River, NJ: Prentice-Hall. 1998

Wentworth, R.A.D. Experiments in General Chemistry. 5th ed. Boston: Houghton Mifflin Co. 1999.

Gammon, Steven D. et al. Interactive Chemistry Journey. Upper Saddle River, NJ: Prentice-Hall. 1998

Hein, Morris and Susan Arena. Foundations of College Chemistry. 10th ed. Pacific Grove, CA: Brooks/Cole Publishing Co. 1999.

Ebbing, Darell D. and Steven D. Gammon. General Chemistry. 6th ed. Boston: Houghton Mifflin Co. 1999.

Brown, William H. and Christopher S. Foote. Organic Chemistry. 2nd ed. Fort Worth, TX: Saunders College Publishing. 1998.

Stanitski, Conrad, ed. Chemistry in Context: Applying Chemistry to Society. 3rd ed. New York: McGraw Hill. 2000.

Balling, Robert C. The Heated Debate. San Francisco: Pacific Research Institute for Public Policy. 1992.

Baggot,Jim. The Meaning of Quantum Theory: A Guide to Students of Chemistry and Physics. Oxford, England: Oxford University Press. 1992.

Gribbin, John. In Search of Shrodinger's Cat: Quantum Physics and Reality. New York: Bantam Doubleday Dell Publishers. 1985.

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics, and Engineering **DATE** October 12, 2005

COURSE TITLE: General Physics I **COURSE NO.:** PHYS 200 **UNITS:** 5

LEC HRS. 4 **LAB HRS.** 3 **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO. (s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

This course is designed to give an understanding of the fundamental principles of physics in the area of mechanics.

II. A. PREREQUISITES, if any:

MATH 192 with a grade of C or better.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. The student will solve problems involving SI units, scientific notation, dimensional analysis, and calculations to the proper number of significant figures.

2. The student will solve problems involving vectors, scalars, frames of reference, components of a vector, and unit vectors.

3. The student will solve one-dimensional motion problems involving position, velocity, and acceleration.

4. The student will solve problems involving two-dimensional motion with vector applications.

5. The student will solve problems involving Newton's laws and their applications, including friction.

6. The student will solve problems involving circular motion, accelerated frames of reference, and motion in the presence of resistive forces.

7. The student will solve problems involving work, energy, and power.

8. The student will solve problems involving potential and kinetic energies and conservation of energy.

9. The student will solve problems involving impulse, momentum, and center of mass.

10. The student will solve problems involving rotation about a fixed axis of a rigid body.

11. The student will solve problems involving angular momentum and torque as vector quantities.

12. The student will solve problems involving static equilibrium of a rigid body.

13. The student will solve problems involving simple harmonic motion, damped, and forced oscillations.

14. The student will solve problems involving the law of universal gravitation, Kepler's Laws of planetary motion, and gravitational potential energy.

15. The student will solve problems involving the mechanics of solids and fluids.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE
1. The standards of length, mass, and time A. Density B. Atomic mass C. Dimensional analysis D. Conversion of units E. Significant figures F. Scientific notation	5%
2. Vectors and their components A. Unit vectors B. Scalars C. Frames of reference	7%
3. One dimensional motion A. Velocity and acceleration B. Free-falling bodies	6%
4. Two-dimensional motion A. Projectile motion B. Uniform circular motion C. Curvilinear motion D. Relative velocity and acceleration	7%
5. Newton's Laws A. Concepts of force B. Mass C. Weight D. Applications of Newton's Laws E. Friction	7%
6. Fundamental forces A. Nonuniform circular motion B. Accelerated frames C. Resistive forces	6%
7. Work, energy and power A. Scalar products B. Kinetic energy C. Potential energy D. Power	7%
8. Conservative and non-conservative forces A. Mechanical energy B. Gravitational potential energy C. Spring energy D. Work-energy theorem E. Conservation of energy F. Energy from the tides	6%
9. Momentum A. Impulse momentum B. Collisions C. Center of mass D. Systems of particles E. Rocket propulsion	7%

10. Rotation problems A. Angular velocity B. Angular acceleration C. Angular momentum and torque D. Relationships between linear and angular quantities E. Rotational kinetic energy F. Moment of inertia G. Work and energy in rotational motion	7%
11. Vector applications of angular momentum and torque.	7%
12. Conditions of static equilibrium and center of gravity for rigid bodies.	7%
13. Harmonic motion A. Simple harmonic motion B. Pendulum C. Mass on a spring D. Damped and forced vibrations	7%
14. Gravitation A. Newton's Law of Universal Gravitation B. Kepler's Laws C. Gravitational Field	7%
15. Elastic properties of materials A. Density and pressure B. Variation of pressure with depth C. Archimedes' and Bernoulli's Principles D. Viscosity E. Laminar and turbulent flow F. Energy from the wind	7%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	**Simulation/** X	**Case Study**	X

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____

Other

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Young, Hugh D., and Roger A. Freedman. Physics with Modern Physics with Mastering Physics. 11th edition. Benjamin Cummings, 2004.

Knight, Randall D. Physics for Scientists and Engineers: A Strategic Approach with Modern Physics (chs. 1-42) with Mastering Physics™. Benjamin Cummings, 2004.

Fishbane, Paul, and Stephen Gasiorowicz. University of Virginia Physics for Scientists and Engineers. 3 edition. Prentice Hall, 2005.

Giancoli , Douglas C. Physics for Scientists and Engineers with Modern Physics. 3rd edition. Prentice Hall, 2000.

Serway, Raymond A., and John W. Jewett, Jr. Physics for Scientists and Engineers. 6th edtion. Thomsan, 2004.

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics and Engineering **DATE:** October 2004

COURSE TITLE: General Physics II **COURSE NO.:** PHYS 202 **UNITS:** 5

LEC HRS. 4 **LAB HRS.** 3 **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

This course is designed to give an understanding of the fundamental principles of physics in the areas of electricity, magnetism, atomic, and nuclear physics.

II. A. PREREQUISITES, if any:

PHYS 200 with a grade of "C" or better and MATH 194 with a grade of "C" or better or concurrent enrollment in MATH 194.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. The student will solve problems involving electric charges, electric field line,s and the motion of a charged particle in a uniform electric field.

2. The student will solve problems involving Gauss' Law.

3. The student will solve problems involving electrical potential, potential energy due to point charges and continuous charge distributions.

4. The student will solve problems involving capacitors.

5. The student will solve problems involving current, resistance, electrical energy and power.

6. The student will solve problems involving EMF, resistor combinations, Kirchoff's Law, and RC circuits.

7. The student will solve problems involving magnetic fields in and near conductors, and the motion of charged particles in a magnetic field.

8. The student will solve problems involving the magnetic field of various sources.

9. The student will solve problems involving Faraday's and Lenz's Laws, and induced EMFs.

10. The student will solve problems involving inductance for RL, LC, and RLC circuits.

11. The student will solve problems involving resistors, inductors, and capacitors in an AC circuit.

12. The student will solve problems involving electromagnetic waves.

13. The student will solve problems involving molecular bonds, the energy spectra of molecules, and semiconductors.

14. The student will solve problems involving nuclear binding energy, radioactivity, and the decay process.

15. The student will solve problems involving collisions between nuclear particles, fission, fusion, and elementary particles.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE
1. Electric charges A. Coulomb;s Law B. Electric field lines C. Motion of charged particle in a unidrom electric field D. The oscilloscope	6%
2. Application of Gauss' Law	6%
3. Electrical potential A. Potential energy due to point charges B. Continuous charge distributions C. Potential of a charged conductor D. Applications of electrostatics	7%
4. Capacitance and energy stored in capacitors and combinations thereof.	7%
5. Electrical energy and power A. Current B. Resistance C. Resistivity D. Ohm's Law	7%
6. Electrical circuits A. EMF B. Resistors in series and parallel C. Kitchoff's Laws D. RC circuits E. Potentimeters	7%
7. Magnetic fields in and near conductors A.. Magnetic force on a conductor B. Torque on a loop C. Motion of a charged particle in a magnetic field D. The Hall effect	6%
8. Magnetic fields of various sources A. Sources of magnetic fields B. Gauss' Law of magnetism C. Displacement current D. Magnetism in matter	6%
9. Examples of laws of magnetism A. Faraday's and Lenz's Laws B. Induced MFs C. RL and RLC circuits D. Motors and generators	7%
10. Circuits A. Inductance B. RL circuits C. LC circuits D. RLC circuits	6%

CORE CONTENT	APPROX. % OF COURSE
12. Electromagnetic waves A. Maxwell's Equations B. Energy and momentum of electromagnetic waves	7%
13. Bonds, energy and spectra of molecules, semiconductors	7%
14. Nuclear binding A. Properties of nuclei B. Nuclear models C. Binding energy D. Radioactivity E. Decay processes	7%
15. Nuclear collisions A. Fission B. Fusion C. Reactors D. Elementary particles	7%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	**Simulation/** X	**Case Study**	X

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____

Other

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Hugh D. Young, Carnegie-Mellon University and Roger A. Freedman, University of California, Santa Barbara University. Physics with Modern Physics with Mastering Physics, 11/E
© 2004 / 0-8053-8684-X / Benjamin Cummings

Randall D. Knight, California Polytechnic State University-San Luis Obispo. Physics for Scientists and Engineers: A Strategic Approach with Modern Physics (chs.1-42) with Mastering Physics™
© 2004 / 0-8053-8685-8 / Benjamin Cummings

Paul Fishbane, University of Virginia and Stephen Gasiorowicz, University of Minnesota and Steve Thornton, University of Virginia Physics for Scientists and Engineers, 3/E
© 2005 / 0-13-142094-1 / Prentice Hall

Douglas C. Giancoli. Physics for Scientists and Engineers with Modern Physics, 3/E
© 2000 / 0-13-021517-1 / Prentice Hall

Raymond A. Serway and John W. Jewett, Jr.. Physics for Scientists and Engineers, 6/E © 2004 / Thomson

IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Science, Mathematics and Engineering **DATE:** October 2004

COURSE TITLE: General Physics III **COURSE NO.:** PHYS 204 **UNITS:** 5

LEC HRS. 4 **LAB HRS.** 3 **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

This course is designed to give an understanding of the fundamental principles of physics in the areas of waves, heat, light, relativity, quantum mechanics and atomic physics.

II. A. PREREQUISITES, if any:

PHYS 200 with a grade of "C" or better and MATH 194 with a grade of "C" or better or concurrent enrollment in MATH 194.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

III. GRADING CRITERIA:

X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. The student will solve problems involving interference, reflection, and transmission of transverse waves.

2. The student will solve problems involving velocity, frequency, energy, intensity, and the Doppler effect of sound waves.

3. The student will solve problems involving resonance, super-position and interference of standing waves in air, strings, rods and plates.

4. The student will solve problems involving temperature, thermometric properties, and temperature scales.

5. The student will solve problems involving thermal energy, heat capacity, latent heat, heat transfer, and the first law of thermodynamics.

6. The student will solve problems involving the kinetic theory of gases and the concepts of ideal gases.

7. The student will solve problems involving heat engines, refrigeration, entropy, and the second law of thermodynamics.

8. The student will solve problems involving Huygens' Principle, reflection, and refraction.

9. The student will solve problems involving images formed by plane mirrors, spherical mirrors, and thin lenses.

10. The student will solve problems involving interference of light waves, Young's Double Slit Experiment, and interference in thin films.

11. The student will solve problems involving single slit diffraction, resolution, diffraction gratings, and polarization.

12. The student will solve problems involving Einstein's Theory of special relativity.

13. The student will solve problems involving the hypothesis of Planck, Einstein's photoelectric effect, atomic spectra, and the Bohr theory of the atom.

14. The student will solve problems involving the waved properties of particles, the uncertainty principle, and the Schrodinger wave equation.

15. The student will solve problems involving the hydrogen atom, quantum numbers, electron spin, and the exclusion principle.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE
1. Types of waves, velocity, interference, reflection and transmission of waves. The linear wave equation.	6%
2. Velocity, frequency, energy and intensity, and the Doppler effect of sound waves.	7%
3. Superposition and standing waves in strings, air columns, rods, and plates.	7%
4. Temperature, thermometers, Celsius and Kelvin scales, thermal expansion of solids and liquids, and ideal gases.	6%
5. Thermal energy, heat capacity, latent heat, heat transfer, mechanical equivalent of heat, and the first law of thermodynamics.	7%
6. Kinetic theory of gases, Van der Waal's equation of state.	7%
7. Heat engines, refrigeration, the Carnot cycle, entropy, and energy conversion.	7%
8. Nature and speed of light, Huygens' Principle, reflection and refraction of light.	6%
9. Images formed by plane mirrors, spherical mirrors, and thin lenses. Lens aberations and optical instruments.	7%
10. Young's double slit experiment, change of phase in reflection, interference in thin films, and Michelson Interferometers.	6%
11. Single slit diffraction, resolution, diffraction gratings, and polarization.	6%
12. Special Theory of Relativity, contributions of Einstein and Lorentz, relativistic momentum and energy.	7%
13. Planck's hypothesis, photoelectric effect, atomic spectra, and Bohr's Theory of Hydrogen.	7%
14. Wave properties of particles, uncertainty principle, particle in a box, and Schrodinger's wave equation.	7%
15. The hydrogen atom, quantum numbers, electron spin, exclusion principle.	7%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	X	**Class Activity**	X	**Written Assignments**	X
Problem Solving Exercise	X	**Final Exam**	X	**Oral Assignments**	X
Skill Demonstration	X	**Objective**	X	**Quizzes**	X
Other	X				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	X	**Discussion**	X	**Demonstration**	X
Audio Visual	X	**Group Activity**	X	**Lab Activity**	X
Computer Assisted Instruction	X	**Individual Assistance**	**Simulation/** X	**Case Study**	X

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. _____

Other

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Hugh D. Young, Carnegie-Mellon University and Roger A. Freedman, University of California, Santa Barbara University. Physics with Modern Physics with Mastering Physics, 11/E
© 2004 / 0-8053-8684-X / Benjamin Cummings

Randall D. Knight, California Polytechnic State University-San Luis Obispo. Physics for Scientists and Engineers: A Strategic Approach with Modern Physics (chs. 1-42) with Mastering Physics™
© 2004 / 0-8053-8685-8 / Benjamin Cummings

Paul Fishbane, University of Virginia and Stephen Gasiorowicz, University of Minnesota and Steve Thornton, University of Virginia Physics for Scientists and Engineers, 3/E
© 2005 / 0-13-142094-1 / Prentice Hall

Douglas C. Giancoli. Physics for Scientists and Engineers with Modern Physics, 3/E © 2000 / 0-13-021517-1 / Prentice Hall

Raymond A. Serway and John W. Jewett, Jr.. Physics for Scientists and Engineers, 6/E © 2004 / Thomson