



Los Angeles Community College District

COURSE OUTLINE

(Replaces PNCR and Course Outline)

Section I: BASIC COURSE INFORMATION

OUTLINE STATUS: Course Update

- 1. COLLEGE: Valley
2. SUBJECT (DISCIPLINE) NAME1: Chemistry
3. COURSE NUMBER: 221
4. COURSE TITLE: Biochemistry for Science Majors
5. UNITS: 5
6. CATALOG COURSE DESCRIPTION -- Provide a description of the course, including an overview of the topics covered:

Introduces the student to the chemistry and metabolism of biological substances. Topics include the structure and function of proteins, polynucleotides and membranes; the chemistry of amino acids, saccharides and nucleotides; and the primary anabolic and catabolic pathways of intermediary metabolism.

- 7. CLASS SCHEDULE COURSE DESCRIPTION -- Provide a brief description of the course, including an overview of the topics covered:

Biochemistry for Science Majors is a course designed to introduce students to the chemical and physiological principles of intermediary metabolism and molecular biology.

- 8. INITIAL COLLEGE APPROVAL DATE:
9. UPDATES (check all applicable boxes):

- Content Last Update: Dec2005
Objectives Last Update: Dec2005
College Specific Course Attributes/Data Elements Last Update:
Districtwide Course Attributes/Data Elements Last Update:
Other (describe) Last Update:

[Empty rectangular box]

10. CLASS HOURS:

Table with 3 columns: Standard Hours per Week (based on), Total Hours per Term (hrs per week), Units

1 Underlined course attributes are the same for the course throughout the LACCD; all other course attributes are college specific.

| | 18 weeks) | x 18) | |
|---------------------------------|-----------|--------|------|
| Lecture: | 5.00 | 90.00 | 3.00 |
| Lab/activity (w/ homework): | 4.00 | 72.00 | 2.00 |
| Lab/activity (w/o homework): | | | |
| Total: | 9.00 | 162.00 | 5.00 |

Note: The Carnegie Rule and Title 5, section 55002 sets forth the following minimum standards: 1 unit = 1 hour lecture per week, 2 hours homework per week; **OR** 2 hours per week of lab with homework; **OR** 3 hours of lab per week without homework. The hours per week are based on a standard 18-week calendar. Lecture also includes discussion and/or demonstration hours, laboratory includes activity and/or studio hours.

11. PREREQUISITES, COREQUISITES, ADVISORIES ON RECOMMENDED PREPARATION, and LIMITATION ON ENROLLMENT

Note: The LACCD's *Policy on Prerequisites, Corequisites and Advisories* requires that the curriculum committee take a separate action verifying that a course's prerequisite, corequisite or advisory is an "appropriate and rational measure of a student's readiness to enter the course or program" and that the prerequisite, corequisite or advisory meets the level of scrutiny delineated in the policy.

. Prerequisites: **Yes** (If Yes, complete information below)

| Subject | Number | Course Title | Units | Validation Approval Date (official use only) |
|-----------|--------|----------------------|-------|--|
| Chemistry | 102 | General Chemistry II | 5.00 | |
| | | | | |
| | | | | |
| | | | | |

. Corequisite: **None** (If Yes, complete information below)

| Subject | Number | Course Title | Units | Validation Approval Date (official use only) |
|---------|--------|--------------|-------|--|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

. Advisories: **None** (If Yes, complete information below)

| Subject | Number | Course Title | Units | Validation Approval Date (official use only) |
|---------|--------|--------------|-------|--|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

12. REPETITIONS -- Number of times course may be repeated for credit (three maximum): 0 **0** (see: Section V, #9)

COLLEGE: Valley

SUBJECT (DISCIPLINE) NAME: Chemistry

COURSE NUMBER: 221

13. OTHER LIMITATIONS ON ENROLLMENT (see Title 5, Section 58106 and Board Rule 6803 for policy on allowable limitations. Other appropriate statutory or regulatory requirements may also apply):

NONE

Section II: COURSE CONTENT AND OBJECTIVES

1. COURSE CONTENT AND OBJECTIVES:

| COURSE CONTENT AND SCOPE – Lecture: If applicable, outline the topics included in the lecture portion of the course (<i>outline reflects course description, all topics covered in class</i>). | Hours per topic | COURSE OBJECTIVES - Lecture (<i>If applicable</i>): Upon successful completion of this course, the student will be able to... (<i>Use action verbs – see Bloom's Taxonomy below for "action verbs requiring cognitive outcomes."</i>) |
|--|-----------------|---|
| Cell structure and physiology | 2 | Define structures of eucaryotic and procaryotic cells |
| Chemistry of water | 2 | |
| Thermodynamics of living systems | 2 | Calculate the composition of a buffer |
| Protein structure | 4 | Analyze three dimensional structure of proteins |
| Chemistry of the amino acids | 4 | Recognize the structures of amino acids |
| Enzyme kinetics | 12 | Calculate enzyme reaction rates |
| Chemistry of the carbohydrates | 20 | Analyze important structures and chemistry of the carbohydrates |
| Carbohydrate metabolism | 12 | Analyze the metabolism of lipids |
| Lipid metabolism | 12 | Organize the pathway of oxidative phosphorylation |
| Citric acid cycle | 4 | Organize the anabolic and catabolic pathways of the citric acid cycle |
| Oxidative phosphorylation | 2 | Recognize the primary pathways of anabolism and catabolism of nitrogen containing compounds |
| Anabolism of nitrogen containing compounds | 2 | |
| Catabolism of nitrogen containing compounds | 2 | |
| Urea cycle | 2 | Organize the urea cycle pathway |
| DNA structure and genetic information | 2 | Analyze the structure of DNA |
| Transcription and its control | 4 | Discuss the role of translational and transcriptional control in cell metabolism |
| Translation and its control | 4 | |
| Total Lecture hours* | 90.00 | |

| COURSE CONTENT AND SCOPE -- Laboratory: If applicable, outline the topics included in the laboratory portion of the course (<i>outline reflects course description, all topics covered in class</i>). | Hours per Topic | COURSE OBJECTIVES - Laboratory (<i>If applicable</i>): Upon successful completion of this course, the student will be able to... (<i>Use action verbs – see Bloom's Taxonomy below for "action verbs requiring cognitive outcomes."</i>) ² |
|---|-----------------|---|
| Titration of strong and weak acids | 8 | Analyze a titration curve |
| Prepare a Buffer | 4 | Measure the pH of a buffered solution |
| Titrate a buffer | 4 | Analyze the behavior of a buffer |
| Chromatographic Analysis of amino acids | 6 | Operate paper chromatography |
| Techniques of protein purification | 6 | Operate gel electrophoresis apparatus |
| Enzyme kinetic analysis of acid phosphatase | 20 | Operate a spectrophotometer and use the information to calculate enzyme reaction rates |
| Chemical and physical properties of carbohydrates | 4 | Intrepret chemical test information to deduce the nature of a carbohydrate |
| Isolation and characterization of lipids from nutmeg | 20 | Operate lab equipment required for the isolation and characterization of lipids |

² In general "activity" courses or portions of courses are classified "laboratory."

| | | |
|--|------------------|-------|
| | | |
| | Total Lab hours* | 72.00 |

*Total lecture and laboratory hours (which include the final examination) must equal totals on page 1.

Bloom's Taxonomy

| SIMPLE SKILLS <<----->> COMPLEX SKILLS | | | | | |
|--|----------------------|--------------------|-------------------|------------------|-------------------|
| | | | Critical Thinking | | |
| <u>Knowledge</u> | <u>Comprehension</u> | <u>Application</u> | <u>Analysis</u> | <u>Synthesis</u> | <u>Evaluation</u> |
| define | translate | interpret | distinguish | compose | judge |
| repeat | restate | apply | analyze | plan | appraise |
| record | discuss | employ | differentiate | propose | evaluate |
| list | describe | use | appraise | design | rate |
| recall | recognize | demonstrate | calculate | formulate | compare |
| name | explain | dramatize | experiment | arrange | value |
| relate | express | practice | test | assemble | revise |
| underline | identify | illustrate | compare | collect | score |
| | locate | operate | contrast | construct | select |
| | report | schedule | criticize | create | choose |
| | review | shop | diagram | set up | assess |
| | tell | sketch | inspect | organize | estimate |
| | | | debate | prepare | measure |
| | | | inventory | | |
| | | | question | | |
| | | | relate | | |
| | | | solve | | |
| | | | examine | | |
| | | | categorize | | |

2. REQUIRED TEXTS:

Provide a representative list of textbooks and other required reading; include author, title and date of publication:

McKee, T and McKee, JR, Biochemistry: An Introduction, 2004.
LAVC Department of Chemistry and Physics, Laboratory Manual for Chem 221, 2005.

3. SUPPLEMENTARY READINGS:

Reading assignments may include, but are not limited to the following:

NONE

4. WRITING ASSIGNMENTS:

Title 5, section 55002 requires grades to be "based on demonstrated proficiency in subject matter and the ability to demonstrate that proficiency, at least in part, by means of essays or, in courses where the curriculum committee deems them to be appropriate, by problem solving exercises or skills demonstrations by students." Writing assignments in this course may include, but are not limited to the following:

Essay questions given on exams. Essays require the student to integrate information presented in class to answer a critical thinking type problem.

5. REPRESENTATIVE OUTSIDE ASSIGNMENTS:

Out of class assignments may include, but are not limited to the following:

Memorize structures of key metabolites. Memorize key pathways of intermediary metabolism (glycolysis, gluconeogenesis, citric acid cycle, fatty acid synthesis and oxidation, urea cycle. Use the Henderson Hasselbalch equation to solve buffer problems, the Lineweaver Burke plot to analyze enzyme kinetics and the Michaelis Menton equation to calculate enzyme reaction rates.

6. REPRESENTATIVE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING:

Title 5, section 55002(a) requires that a degree-applicable course have a level of rigor that includes "critical thinking and the understanding and application of concepts determined by the curriculum committee to be at college level". Critical thinking may include, but is not limited to analysis, synthesis, and evaluation. Provide examples of assignments that demonstrate critical thinking.

Essay questions on exam requiring students to explain how varying concentrations of key metabolites influence the flow of carbon through a number of metabolic pathways. Essays asking students to provide a biochemical basis for several well characterized genetic diseases.

7. METHODS OF EVALUATION:

Title 5, section 55002 requires grades to be "based on demonstrated proficiency in subject matter and the ability to demonstrate that proficiency, at least in part, by means of essays, or, in courses where the curriculum committee deems them to be appropriate, by problem solving exercises or skills demonstrations by students." Methods of evaluation may include, but are not limited to the following (please note that evaluation should measure the outcomes detailed "Course Objectives" at the beginning of Section II):

Solve problems involving weak acid/base ionizations, buffers. Solve enzyme kinetics problems. Write out the key metabolic pathways described in the lectures. Analyze the relationships between different metabolic pathways and demonstrate how different pathways influence each other.

8. METHODS OF INSTRUCTION:

Methods of instruction may include, but are not limited to the following:

- Lecture
- Discussion
- Laboratory
- Activity
- Field Experience
- Independent Study
- Other (explain)

9. SUPPLIES:

List the supplies the student must provide.

Scientific calculator, laboratory safety goggles

10. COMPUTER COMPETENCY:

If applicable, explain how computer competency is included in the course.

11. INFORMATION COMPETENCY:

Information competency is the ability to find, evaluate use, and communicate information in all its various formats. It combines aspects of library literacy, research methods and technological literacy. Information competency includes consideration of the ethical and legal implications and requires the application of both critical thinking and communications skills. If applicable, explain how information competency is included in the course.

After collecting experimental data, students must analyze their results and present their conclusions in lab reports.

12. DIVERSITY:

If applicable, explain how diversity (e.g., cultural, gender, etc.) is included in the course.

13. SCANS COMPETENCIES (required for all courses with vocational TOP Codes; recommended for all courses):

SCANS (**S**ecretary's **C**ommission on **N**ecessary **S**kills) are skills the Department of Labor identified, in consultation with business and industry leaders, which reflect the skills necessary for success in the workplace. Check the appropriate boxes to indicate the areas where students will develop the following skills (please note that all SCANS competencies do not apply to all courses):

RESOURCES

- Managing Time:** Selecting relevant goal-related activities, ranking them in order of importance, allocating time to activities, and understanding, preparing and following schedules.
- Managing Money:** Using or preparing budgets, including making cost and revenue forecasts; keeping detailed records to track budget performance, and making appropriate adjustments.

- Managing Material and Facility Resources:** Acquiring, storing, allocating, and distributing materials, supplies, parts, equipment, space or final products in order to make the best use of them.

INTERPERSONAL

- Participating as Member of a Team:** Working cooperatively with others and contributing to group's efforts with ideas, suggestions and effort.
- Teaching Others New Skills:** Helping others learn needed knowledge and skills.
- Exercising Leadership:** Communicating thoughts, feelings, and ideas to justify a position, encouraging, persuading, convincing or otherwise motivating an individual or group, including responsibly challenging existing procedures, policies or authority.
- Negotiating:** Working toward agreement that may involve exchanging specific resources or resolving divergent interests.
- Working with Cultural Diversity:** Working well with men and women and with people from a variety of ethnic, social, or educational backgrounds.

INFORMATION

- Acquiring and Evaluating Information:** Identifying a need for data, obtaining the data from existing sources or creating them, and evaluating their relevance and accuracy.
- Organizing and Maintaining Information:** Organizing, processing and maintaining written or computerized records and other forms of information in a systematic fashion.
- Interpreting and Communicating Information:** Selecting and analyzing information and communicating the results of others, using oral, written, graphic, pictorial, or multimedia methods.
- Using Computers to Process Information:** Employing computers to acquire, organize, analyze and communicate information.

SYSTEMS

- Understanding Systems:** Knowing how social, organizational and technological systems work and operating effectively with them.
- Monitoring and Correcting Performance:** Distinguishing trends, predicting impacts of actions on system operations, diagnosing deviations in the functioning of a system/organization, and taking necessary steps to correct performance.
- Improving or Designs Systems:** Making suggestions to modify existing systems in order to improve the quality of products or services and developing new or alternative systems.

TECHNOLOGY

- Selecting Technology:** Judging which sets of procedures, tools or machines, including computers and their programs, will produce the desired results.
- Applying Technology to Tasks:** Understanding overall intent and proper procedures for setting up and operating machines, including computers and their reprogramming systems.
- Maintaining and Troubleshooting Equipment:** Preventing, identifying, or solving problems with equipment, including computers and other technologies.

Section III: RELATIONSHIP TO COLLEGE PROGRAMS

1. **THIS COURSE WILL BE AN APPROVED REQUIREMENT FOR AN APPROVED ASSOCIATE DEGREE OR CERTIFICATE PROGRAM:** Yes

- a. If yes, the course will be a "restricted" elective portion of the "approved program" listed on the State Chancellor's Inventory of Approved Programs (approved programs can be found on the State Chancellor's Office website at <http://misweb.cccco.edu/esed/webproginv/prod/invmenu.htm>)

A.S. degree in Chemistry

NOTE: In order for a course to be approved as a requirement for an associate degree or certificate program, the program must be listed on the State Chancellor's Office *Inventory of Approved Programs* AND the course must be listed in the college catalog as either a requirement or an elective for the program. If course is not part of an approved program at the college adopting the course, it will be considered to be a "stand-alone" course, and is subject to the State Chancellor's approval criteria. The college must complete and submit the Chancellor's Office "APPLICATION FOR APPROVAL OF CREDIT" form. Certain courses are granted "blanket approval" by the State Chancellor's Office and do not require separate approval. See the Chancellor's Office *Program and Course Approval Handbook* for details. LACCD Skills **Certificates are not State approved programs** and are not listed on the Chancellor's Office *Inventory of Approved Programs*.

2. **GENERAL EDUCATION REQUIREMENTS FOR THE ASSOCIATE DEGREE STATUS:**

- a. Area requested: None Approval date:

If applicable, provide an explanation of how the course meets the General Education parameters for one of the five general education areas – *Natural Sciences, Social and Behavioral Sciences, Humanities, Language and Rationality, Health and Physical Education* -- contained in Board Rule 6201.14 -General Education Requirements. http://marlin.laccd.edu/district/BoardRules_AdmRegs/boardrules.htm

- a. 2nd Area requested: None Approval date:

If applicable, provide an explanation of how the course meets General Education parameters for an additional general education area – *Natural Sciences, Social and Behavioral Sciences, Humanities, Language and Rationality, Health and Physical Education* -- contained in Board Rule 6201.14 - General Education Requirements. http://marlin.laccd.edu/district/BoardRules_AdmRegs/boardrules.htm

Section IV: ARTICULATION INFORMATION

(Complete in consultation with College Articulation Officer)

1. TRANSFER STATUS:a. Transferable to the University of California: **Yes**c. Transferable to the California State University: **Yes**b. UC **approval** date:d. College **approval** date:**2. GENERAL EDUCATION FOR TRANSFER:****IGETC Certification:**a. Area requested: **5-A: Physical Sciences**

b. Date requested:

c. IGETC **approval** date:

If applicable, provide an explanation of how the course meets the appropriate General Education parameters, as defined in IGETC Certification Guidelines.

CSU Certification:a. Area requested: **None**

b. Date requested:

c. CSU **approval** date:

If applicable, provide an explanation of how the course meets the appropriate General Education parameters, as defined in CSU Certification Guidelines.

a. 2nd Area requested: **5-B: Biological Sciences**

b. Date requested:

c. IGETC **approval** date:

If applicable, provide an explanation of how the course meets the appropriate General Education parameters, as defined in IGETC Certification Guidelines.

a. 2nd Area requested: **None**

b. Date requested:

c. CSU **approval** date:

If applicable, provide an explanation of how the course meets the appropriate General Education parameters, as defined in CSU Certification Guidelines.

3. MAJOR REQUIREMENT FOR TRANSFER – Will this course be articulated to meet lower division major requirements?

YES

List college/university and the majors:

| College/University | Major(s) |
|--------------------|-----------------------|
| UCLA | Biology and Chemistry |

CAN NUMBER: **CAN SEQUENCE NUMBER:**

CAN Approval -- Date requested:

Date approved:

Section V: SUPPLEMENTAL COURSE INFORMATION

1. **DEPARTMENT/DIVISION NAME:** Chemistry and Physics
2. **DEPARTMENT/DIVISION CODE:** 21
3. **SUBJECT CODE** -- 3 characters, assigned by District Office: **183** (existing subject codes are available on the LACCD web site at <http://www.laccd.edu/curriculum/directory-programs-courses/index.htm>)
4. **SUBJECT ABBREVIATION** -- 7 characters, assigned by District Office: **Chem**
5. **SPC CODE** -- 3 characters, assigned by District Office:
6. **ABBREVIATION FOR TRANSCRIPTS** -- 20 characters, assigned by District Office: **Biochem for Sci Maj**
7. **DEGREE CREDIT:** Indicate whether the course meet the "standards for approval" for degree credit course set forth in Title 5, section 55002(a)(2), which requires the course to have a degree of intensity, difficulty, and vocabulary that the curriculum committee has determined to be at the college level :
This courses is **Degree Applicable**
8. **CREDIT/NO CREDIT GRADING:** **Option**
9. **REPETITIONS** -- Number of times course may be repeated for credit (three maximum): **0**

How does the repetition of this course meet Title 5, section 58161 requirements? A course may be repeatable when, "course content differs each time it is offered, and that the student who repeats it is gaining an expanded educational experience for one of the following reasons: (A) Skills or proficiencies are enhanced by supervised repetition and practice within class periods; or (B) Active participatory experience in individual study or group assignments is the basic means by which learning objectives are obtained."

-
10. **PRIOR TO TRANSFERABLE LEVEL** – This course attribute applies to **English, writing, ESL, reading** and **mathematics** courses ONLY. If applicable, indicate how many levels below the transferable level this course should be placed: **Not applicable**
 11. **CREDIT BASIC SKILLS** -- Title 5, section 55502(d) defines basic skills as "courses in reading, writing, computation, and English as a Second Language, which are designated as non-degree credit courses pursuant to Title 5, section 55002(b)." **No**
If Yes, course must be non-degree applicable.
 12. **CROSS REFERENCE** -- Is this course listed as equivalent in content to existing College/District courses in another discipline? **No**

If Yes, list courses (documentation of cross-discipline agreement must be provided):

13. **COURSE SPECIFICALLY DESIGNED FOR STUDENTS WITH DISABILITIES** -- Title 5, section 56029 allows a course to be repeatble when continuing success of the students with disabilities is dependent on additional repetitions of a specific class. Is this course designated as an "approved special class" for students with disabilities? **No**

If yes, provide an explanation of how this course meets the requirements of Title 5, section 56029.

14. **COOPERATIVE EDUCATION STATUS** -- Title 5, section 55252 allows for two types of Cooperative Education: 1) General Work Experience Education -- i.e., supervised employment, which is intended to assist students in acquiring desirable work habits, attitudes and career awareness, which need not be related to the students' educational goals; or 2) Occupational Work Experience Education -- i.e., supervised employment, extending classroom based occupational learning at an on-the-job learning station, which is related to the students' educational or occupational goal. Is this course part of the college's approved cooperative work experience education program? **No**

15. **COURSE CLASSIFICATION:** Liberal Arts Sciences

Note: A course's Classification, TOP Code and SAM code must be aligned – e.g., Courses with an "Occupational" Course Classification must have an "Occupational" TOP Code **and** a SAM Code of A, B, C, or D; courses that do not have an "Occupational" Course Classification cannot have an Occupational TOP Code **and** must have an "E" SAM Code. Courses coded as "basic skills" in #11 should be coded "Adult and Secondary Basic Skills."

16. **TOP CODE – (6 digits XXXX.XX) 1905.0**

Course content should match discipline description in Taxonomy of Programs found at www.cccco.edu/ccco/esed/curric/curriculum.htm.

17. **SAM CODE (Student Accountability Model): E - Non-Occupational**

SAM Codes (see CCC Chancellor's Office *Student Accountability Model Operations Manual*, 1984) should be assigned as follows:

Priority "A" – Apprenticeship: Courses designed for an indentured apprentice must have the approval of the State of California, Department of Industrial Relations Department, Division of Apprenticeship Standards.

Priority "B" – Advanced Occupational: Courses taken by students in the advanced stages of their occupational programs. Courses should be offered in one specific occupational area only. Priority letter "B" should be assigned sparingly; in most cases, no more than two courses in any one program should be labeled "B." "B"-level courses must have Priority "C" prerequisites in the same program area.

Priority "C" – Clearly Occupational: Courses generally taken by students in the middle stages of their programs should have a difficulty level sufficient to detract "drop-ins." Courses may be offered in several occupational programs within a broad area. The "C" priority, however, should also be used for courses within a specific program area when the criteria for "B" classification are not met. A "C"-level course should provide the student with entry-level job skills.

Priority "D" – Possibly Occupational: "D" courses are those taken by students in the beginning stages of their occupational programs. The "D" priority can also be used for service (or survey) courses for other occupational programs.

Priority "E" – Non-occupational.

SECTION VI: APPROVAL STATUS**1. APPROVAL STATUS:**

- | | | | | |
|--|---|------------------------|---|---------------------|
| a. <input type="checkbox"/> New Course | . | Board Approval Date: | . | Effective Semester: |
| b. <input type="checkbox"/> Addition of Existing District Course | . | College Approval Date: | . | Effective Semester: |
| c. <input type="checkbox"/> Course Change* | . | College Approval Date: | . | Effective Semester: |
| d. <input checked="" type="checkbox"/> Outline Update | . | College Approval Date: | | |
- 10/24/06**

* Changes to a course require the completion of a "Course Change Request" form and approval by the college's Curriculum Committee. In some cases districtwide approval is also required; see, Administrative Regulation E-65, section 3(c) for details.

SECTION VII: APPROVAL INFORMATION FOR NEW OR ADDED COURSES

(complete in consultation with Department Chair and the appropriate Academic Administrator)

1. ORIGINATOR: T E Fickel

2. DEPARTMENT: Chemistry and Physics

3. IF THIS IS A NEW COURSE, INDICATE HOW THE COLLEGE PLANS TO MEET THE EXPENSE OF THIS COURSE:

By additional funds. Describe:

By deleting courses from the college catalog and course database. List specific courses to be deleted:

By deleting sections of existing courses. List courses and number of sections to be deleted:

First year: Second year: Third year:

By rotating sections of existing courses. List courses and number of sections to be rotated, as well as the semesters in which they will be offered:

4. IMPACT -- Will this course directly impact other course offerings and/or associate degree or certificate programs on campus?

No (If yes, briefly explain how)

5. METHOD OF SUPPORT -- Indicate how the college plans to support the proposed course:

Additional staff -- List additional staff needed:

Classroom -- List classroom type needed:

Equipment -- List new equipment needed and indicate funding source for any new equipment:

Supplies- List supplies and indicate dollar value:

Library/Learning Resources- The course initiator shall consult with the College Librarian and review the college library, book, periodical, and electronic resource collections relevant to this course. List additional titles and resources to be considered for purchase as funding permits:

CERTIFICATION AND RECOMMENDATION

This course meets Title 5 requirements for Associate Degree applicable college credit towards an Associate of Arts Degree.

This course meets Title 5 requirements but does not satisfy the requirements for an Associate Degree applicable course.

We certify that the information and answers above properly represent this course.

| | |
|--|----------------------|
| _____ Originator | _____ Date |
| _____ Department/Cluster Chairperson | _____ Date |
| _____ Articulation Officer | _____ Date |
| _____ Librarian | _____ Date |
| _____ Dean (if applicable) | _____ Date |
| _____ Curriculum Committee Chairperson | _____ Date |
| _____ Academic Senate President | _____ Date |
| _____ Vice President, Academic Affairs | _____ Date |
| _____ College President | _____ Date |

DATA INPUT PAGES
(Fills Automatically from Other Pages)

COLLEGE:

APPROVAL STATUS:

New Course

Addition of Existing District
Course

Board Approval Date:

College Approval Date:

Effective Semester:

Effective Semester:

DEPARTMENT/DIVISION NAME: Chemistry and Physics

DEPARTMENT/DIVISION CODE: 21

SUBJECT (DISCIPLINE) NAME: Chemistry

SUBJECT CODE -- 3 characters, assigned by District Office: 183

SUBJECT ABBREVIATION -- 7 characters, assigned by District Office: Chem

COURSE TITLE: Biochemistry for Science Majors

COURSE NUMBER: 221

UNITS:

CLASS HOURS:

| | Hours per week (based on 18 weeks) | Total Hours per term (hrs per week x 18) | Units |
|------------------------------|------------------------------------|--|-------|
| Lecture: | 5.00 | 90.00 | 3.00 |
| Lab/activity (w/ homework): | 4.00 | 72.00 | 2.00 |
| Lab/activity (w/o homework): | | | |
| Total: | 9.00 | 162.00 | 5.00 |

DEGREE CREDIT: Indicate whether the course meet the "standards for approval" for degree credit course set forth in Title 5, section 55002(a)(2), which requires the course to have a degree of intensity, difficulty, and vocabulary that the curriculum committee has determined to be at the college level : This courses is
Degree Applicable

THIS COURSE WILL BE AN APPROVED REQUIREMENT FOR AN APPROVED ASSOCIATE DEGREE OR CERTIFICATE PROGRAM: Yes

If yes, the course will be a "restricted" elective portion of the "approved program" listed on the State Chancellor's Inventory of Approved Programs (approved programs can be found on the State Chancellor's Office website at

GENERAL EDUCATION FOR TRANSFER:

Area requested: None Approval date:

GENERAL EDUCATION REQUIREMENTS FOR THE ASSOCIATE DEGREE STATUS:

Area requested: None Approval date:
2nd Area requested: None Approval date:

TRANSFER STATUS:

Transferable to the University of California: UC approval date:

Transferable to the California State University: College approval date:

GENERAL EDUCATION FOR TRANSFER:**IGETC**

Area requested:
Date requested:
IGETC approval date:

CSU CERTIFICATION

Date requested:
CSU approval date:

ABBREVIATION FOR TRANSCRIPTS -- 20 characters, assigned by District Office:

COURSE CLASSIFICATION:

TOP CODE -- (6 digits XXXX.XX) 1905.0

SAM CODE (Student Accountability Model):

PREREQUISITES, COREQUISITES, ADVISORIES ON RECOMMENDED PREPARATION, and LIMITATION ON ENROLLMENT

Prerequisites: Yes (If Yes, complete information below)
Corequisite: None (If Yes, complete information below)

CREDIT/NO CREDIT GRADING: Option

REPETITIONS -- Number of times course may be repeated for credit (three maximum): 0

CROSS REFERENCE -- Is this course listed as equivalent in content to existing College/District courses in another discipline? No

CREDIT BASIC SKILLS -- Title 5, section 55502(d) defines basic skills as "courses in reading, writing, computation, and English as a Second Language, which are designated as non-degree credit courses pursuant to Title 5, section 55002(b)." No
If Yes, course must be non-degree applicable

COURSE SPECIFICALLY DESIGNED FOR STUDENTS WITH DISABILITIES -- Title 5, section 56029 allows a course to be repeatable when continuing success of the students with disabilities is dependent on additional repetitions of a specific class. Is this course designated as an "approved special class" for students with disabilities? No

APPROVAL STATUS:

New Course

Board Approval Date:

Effective Semester:

Addition of Existing District Course

College Approval Date:

COOPERATIVE EDUCATION STATUS -- Title 5, section 55252 allows for two types of Cooperative Education: 1) General Work Experience Education -- i.e., supervised employment, which is intended to assist students in acquiring desirable work habits, attitudes and career awareness, which need not be related to the students' educational goals; or 2) Occupational Work Experience Education -- i.e., supervised employment, extending classroom based occupational learning at an on-the-job learning station, which is related to the students' educational or occupational goal. Is this course part of the college's approved cooperative work experience education program? No

CATALOG COURSE DESCRIPTION -- Provide a description of the course, including an overview of the topics covered:

Introduces the student to the chemistry and metabolism of biological substances. Topics include the structure and function of proteins, polynucleotides and membranes; the chemistry of amino acids, saccharides and nucleotides; and the primary anabolic and catabolic pathways of intermediary metabolism. Physiological aspects of sugar and nitrogen and the role of hormones in regulating these processes will be discussed. The chemistry of replication, transcription and translation will be discussed.

CLASS SCHEDULE COURSE DESCRIPTION -- Provide a brief description of the course, including an overview of the topics covered:

Biochemistry for Science Majors is a course designed to introduce students to the chemical and physiological principles of intermediary metabolism and molecular biology.

SPC CODE -- 3 characters, assigned by District Office: