

Section I: BASIC COURSE INFORMATION

Outline Status: **Approved Course**

1. **COLLEGE: L.A. PIERCE COLLEGE**
2. **SUBJECT: CHEMISTRY**
3. **COURSE NUMBER: 102**
4. **COURSE TITLE: GENERAL CHEMISTRY II**
5. **UNITS: 5**
6. **CATALOG COURSE DESCRIPTION:**

This course is a continuation of Chemistry 101. Topics covered include a detailed study of chemical equilibrium as applied to analytical chemistry including solubility, complex ion, and redox equilibria, pH, buffers, weak acids, weak bases, monoprotic and polyprotic systems; thermodynamics; electrochemistry; the solid state; the relationship between structure and properties; kinetics; coordination chemistry and ligand field theory; visible spectroscopy; and the chemistry of selected metals and nonmetals.

7. **CLASS SCHEDULE COURSE DESCRIPTION:**

This course is a continuation of Chemistry 101. Topics covered include a detailed study of chemical equilibrium as applied to analytical chemistry including solubility, complex ion, and redox equilibria, pH, buffers, weak acids, weak bases, monoprotic and polyprotic systems; thermodynamics; electrochemistry; the solid state; the relationship between structure and properties; kinetics; coordination chemistry and ligand field theory; visible spectroscopy; and the chemistry of selected metals and nonmetals. Second semester college chemistry.

8. **INITIAL COLLEGE APPROVAL DATE:**
9. **LAST UPDATE DATE: 6/4/12**

10. CLASS HOURS:

	Standard Hrs Per Week (based On 18 weeks)	Total Hs per Term (hrs per week x 18)	Units
Lecture:	3	54	3
Lab/Activity (w / homework):	0	0	0
Lab/Activity (w /o homework):	6	108	2
Totals:	Lecture: 3	Lecture: 54	Lecture: 3
	Lab: 6	Lab: 108	Lab: 2
	Total: 9	Total: 162	Total: 5
Totals In Protocol:	Lecture: 3	Lecture: 54	
	Lab: 6	Lab: 108	
	Total: 9	Total: 162	Total: 5

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**

Subject	Course #	Title	Units	Approval Date
Chemistry	101	General Chemistry I	5	6/4/12

Corequisites: **No**

Subject	Course #	Title	Units	Approval Date

Advisories: **No**

Subject	Course #	Title	Units	Approval Date

OTHER LIMITATIONS ON ENROLLMENT (see Title 5, Section 58106 and Board Rule 6803 for policy on

12. allowable

limitations. Other appropriate statutory or regulatory requirements may also apply):

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Section II: COURSE CONTENT AND OBJECTIVES

1. COURSE CONTENT AND OBJECTIVES:

COURSE CONTENT AND SCOPE - Lecture: 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: Upon successful completion of this course, the student will be able to...(Use action verbs - see <i>Bloom's Taxonomy</i> for 'action verbs requiring cognitive outcomes.')
1. Review Stoichiometry, emphasizing solution stoichiometry Net Ionic Equations, Unionized Equations, Total Ionic Equations, Precipitation Reactions, Acid-base Reactions, Redox Reactions	5	Solve a variety of problems related to stoichiometry including solution stoichiometry; write and distinguish the types of equations for representing precipitation reactions, acid-base reactions, and redox reactions.
2. Chemical Equilibrium Principle of equilibrium; equilibrium with respect to physical changes; vapor pressure. The equilibrium constant: definition, calculations and applications Equilibrium and spontaneous processes; Calculating equilibrium constants from standard free energies; Le Chatelier's principle	4	Understand "dynamic" chemical equilibrium: calculate an equilibrium constant; calculate equilibrium concentrations using a concentration summary; know the relationship between K's and free energies; solve problems involving the relationship of Keq's and free energies; relate Kp and Kc; use and explain LeChatelier's principle to predict shifts in equilibrium systems; determine Keq's for related equations.
3. Equilibria of Solutions - I Solubility and solubility product constants, pH dependent precipitations, fractional precipitations, transposition of precipitates Common ion effects	4	Determine which salts are more soluble than others; given the concentrations of ions in solution, calculate a Ksp; be able to distinguish between Ksp and solubility; recognize pH-sensitive precipitations/solubility changes; calculate how much of one ion precipitates before another begins to precipitate (fractional precipitation); predict when a precipitate will form on mixing two solutions; determine solubility when common ions are present.
4. Equilibria of Solutions - II Acid-base systems and pH measurement: Acid strength as a function of structure equilibria of weak acids and weak bases; monoprotic and polyprotic systems including organic examples Titration of acids and bases; titration curves; indicators; Buffer systems and applications	7	Contrast the Arrhenius, Bronsted-Lowry, and Lewis definitions of acids and bases; identify acids, bases and salts; calculate the pH of strong acid and strong base solutions; perform an array of calculations relating to Ka's and Kb's; know the relation of a Ka to a Kb for a conjugate acid/base pair; determine the pH's of weak acids, weak bases, and polyprotic acids; determine the concentrations of all species present in a triprotic acid solution; explain all points along a titration curve for strong
5. Complex Ions and Coordination Compounds Historical review and Werner contributions; IUPAC	4	

nomenclature; physical and chemical methods of analysis Molecular geometry and isomerism of complexes Bonding in complexes - valence bond, crystal field, molecular orbital Complex ions in analytical chemistry and application of metal complexes		acid/strong base titrations, weak acid/strong base titrations, and weak base/strong acid titrations; recognize buffer systems, explain how buffers work, and solve problems involving buffers.
6. Equilibria of Solutions - III Complex ions and stability constants; Dissolution of precipitates Simultaneous competing heterogeneous equilibria	4	Know the Lewis acid/Lewis base interaction in transition metal complexes; define and give examples of the following: ligand, isomer, coordination number, chiral, achiral, optical activity, enantiomers, and enantiomeric pairs; determine the number of isomers a complex has, both geometric and optical; determine if a complex is optically active; name complexes; identify how many unpaired electrons a complex has; determine whether a complex is paramagnetic or diamagnetic; explain why many transition metal complexes are colored; explain why a complex is a certain color.
7. Electrochemistry Electrochemical cells; Cells and cell reactions Thermodynamics and electrochemistry - cell potential and free energy; the electrochemical series The effect of concentration on cell voltage - the Nernst equation; electrical measurement of pH Standard cell potentials and the equilibrium constant Practical cells, corrosion and electrolysis - Faraday's law; electrode reactions; applications	5	Understand the formation of complex ions and the calculations regarding stability constants; evaluate situations in which more than one equilibrium is at play.
8. Chemical Kinetics Basic concepts and terminology of kinetics Factors affecting rates of chemical reactions Rate laws - zero order; first order; introduction to second and higher order Calculations involving activation energies and temperature dependence of rate constants Collision theory and mechanism of chemical reactions	4	Have a basic understanding of redox reactions; identify what has been oxidized/reduced; recognize a voltaic or electrolytic cell and calculate cell potentials; identify relative strengths of oxidizing and reducing agents; understand the linkages between electrochemistry, thermodynamics and equilibrium; calculate cell potentials under non-standard conditions; identify/predict products in electrolytic cells; calculate amounts of materials electroplated out given a current and a length of time.
9. Thermodynamics: Entropy, Free Energy, and Equilibrium	5	
10. The Solid State Types of solids; Bonding forces in solid state Three types of cubic unit cells.	3	Determine rate law expressions and orders from experimental data; determine a rate constant and understand factors that affect the rate constant; understand graphical approaches to interpreting rate data; know the relationship between activation energy and rate constants; use the Clausius-Clapeyron equation in calculations; ascertain whether a reaction mechanism is consistent with experimental results.
	9	

<p>11. Organic Chemistry An introduction to organic chemistry; isomers, functional groups and types of compounds, some important organic compounds, the nomenclature of organic compounds, and some selected reactions of organic compounds.</p>	<p>Recognize cases of increasing and decreasing entropy; understand the concept of entropy; predict whether a reaction or process will be spontaneous; explain the 1st, 2nd and 3rd laws of thermodynamics; understand the relationship between equilibrium and free energy; state the differences between ΔG and ΔG°.</p> <p>Evaluate the number of atoms in a simple cubic unit cell, a face-centered cubic unit cell, and a body-centered unit cell; determine the amount of space occupied by atoms in the three cubic cells; calculate the density of an element given the type of packing and the radius of the atom.</p> <p>Determine the number of isomers that can exist for a certain formula; draw structures of organic compounds given the name, and to name compounds given the structure; predict the products in selected organic reactions given the reactants.</p>
<p>Total: 54</p> <p>Total Lecture Hours In Section I Class Hours: 54</p>	

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

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

1. (cont'd) LAB:

<p>COURSE CONTENT AND SCOPE - Lab: Outline the topics included in the lecture portion of the course (<i>Outline reflects course description, all topics covered in class</i>).</p>	<p>Hours Per Topic</p>	<p>COURSE OBJECTIVES – Lab: Upon successful completion of this course, the student will be able to...(Use action verbs – see <i>Bloom's Taxonomy</i> for 'action verbs requiring cognitive outcomes'.)</p>
<p>Safety and Orientation to the Lab; Review: The Writing of Chemical Equations</p> <p>Qualitative Analysis: From Freeman Separates: Lab 2: Identification of Silver, Lead and Mercury (I) ions Lab 3: Identification of ferric, Aluminum, and Zinc ions Lab 4: Identification of Alkaline Earth and Alkali</p>	<p>4</p> <p>40</p>	<p>Familiarize themselves with safe, efficient and appropriate operations involving the handling of chemicals, glassware and equipment in the chemistry 102 lab; write chemical equations for a series of precipitation, acid-base, and redox reactions.</p> <p>Labs Chem 102</p> <p>All work is individual except where group work specified due to instrumental limitations.</p> <p>Identify ions in unknown samples after first exploring the chemical behavior of the ions in question and learning how to separate the ions efficiently to prevent</p>

Metal Ions
Lab 5: The Qualitative Analysis of Some Common Ions
Handout: The General Unknown

4

"false positives". Throughout the qualitative analysis program, concepts from the lecture are put into practice (i.e. solubility equilibria, buffers, complex ion formation).
Record appropriate observations, conclusions, and net ionic equations directly into a lab notebook.
Unknown slips are turned in for this portion of the lab (no formal reports).

Page 4 Lab Pac: Separation of Ions by Paper Chromatography

8

Paper Chromatography:
Use a contrasting means of separation and identification in which an unknown containing three cations is identified.
An unknown slip is turned in.

page 13 Lab Pac: pH Measurements and Their Application

The remaining labs will be formally written up.

Potentiometric Titrations:
This 2-period lab involves training in calibration and use of a pH meter. The pH of various weak acid solutions, weak base solutions, and buffer solutions are determined; the theoretical values for pH are calculated based on published K_a 's and K_b 's.

4

The second part of this lab requires the preparation and standardization of a NaOH solution. The standardized NaOH is then used in the potentiometric titration of an unknown weak acid. Two major determinations are made: the K_a of the weak acid and the concentration of the weak acid.

The titration curve is generated on the computer via the use of Excel.

page 34 Lab Pac: Electrochemistry

4

Electrochemistry:
In the first part of this experiment, students are trained in the use of a voltmeter. Students then set up and measure the potentials of four voltaic cells, including a concentration cell. Experimental values are compared with theoretical values.

In the second part of the experiment, a series of 5 to 6 electrolytic cells are setup. By careful observation, students are to ascertain the electrolytic reactions that occur.

In both parts, students work in groups of three or less.

4

Spectroscopy:
(In groups due to instrumental limitations) Prepare a series of dilutions in which a complex ion is formed; measure the absorbance of the solutions

page 20 Lab Pac: Spectroscopy

page 38 lab Pac: Chemical Kinetics - The

Hydrolysis of t-butyl chloride		and determine a formation constant, K_f , for the complex ion through a series of calculations. Prepare three solutions of Ni(II) complex ions; obtain the absorption spectra, and determine the spectrochemical ordering of the ligands, base upon calculations.
page 44 Lab Pac: Crystal Structure	4	Kinetics: Indirectly monitor the appearance of a product and determine a rate constant for a hydrolysis reaction. Plot the natural log of the number of moles of a reactant versus time (on Excel), find the slope of the line, the negative of which is the specific rate constant at room temperature, answer a series of questions about related lecture material (i.e. what is the half life for this reaction? How long does it take for 95 % of the material to react?)
Handout- Functional Groups in Organic Chemistry	4	Crystal Structures: Utilize a computer simulation program to determine fractions of atoms within a unit cell, the total number of atoms within a unit cell, the side length of the unit cell in terms of atomic radius, the cell volume, the fraction of empty space in a unit cell, and the coordination numbers of atoms. (Alternatively, students can build models in the lab)
Workshops All workshops one hour unless other number given: 1. Chem 101 Review (Aqueous Reactions) 2. Gas Phase Equilibria I 3. Gas Phase Equilibria II 4. Equilibria Conceptually 5. Acid-Base Chemistry 6. Acid-Base Equilibria I 7. Acid-Base Equilibria II/Introduction to Buffers 8. Buffers I 9. Buffers II (Quantitative Aspects) 10. Titration Curves 11. Polyprotic Titration Curves 12. Solubility Equilibria I 13. Solubility Equilibria II 14. Transition Metal Complexes 15. Crystal Field Theory/Magnetism 16. Kinetics I 17. Kinetics II/Integrated rate equations 18. Thermodynamics I (Enthalpy/Entropy/Gibbs Free Energy) 19. Free Energy and The equilibrium Constant 20. Electrochemistry I 21. Electrochemistry II 22. Quantitative aspects of Electrochemistry/Electrolysis 23. Organic Chemistry/Isomers 24. Organic Chemistry/Alkanes/Alkenes/Types of Compounds 25. Practice Exam I (2 hours) 26. Practice Exam II (2 hours) 27. Practice Exam III (2 hours) 28. Practice Final (2 hours)	32	Investigate a test for unsaturated compounds, a test to differentiate primary from secondary from tertiary alcohols, and a test that differentiates aldehydes from ketones; synthesize three esters from alcohols and acids. Collaborative Learning Assignments where students work on problems related to the lecture material with the guidance of their instructor.

	Total: 108	
Total Lab Hours In Section I Class Hours:	108	

Essential Academic Skills: Reading and Communication

2. REQUIRED TEXTS AND SUPPLEMENTAL READINGS:

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

Title	Author	Year
Chemistry: A Molecular Approach	Tro	2011
Chemistry 102 Lab Manual	Pierce College faculty	2010

3. READING ASSIGNMENTS:

If applicable, reading assignments in this course may include but are not limited to the following:

The textbook and lab experiments.

4. WRITING ASSIGNMENTS:

Writing assignments, as required by Title 5, in this course may include, but are not limited to the following:

Some essay questions on exams and quizzes; written lab reports.

Essential Academic Skills: Critical Thinking and Other Course Components

5. REPRESENTATIVE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING:

Provide examples of assignments, as required by Title 5, that demonstrate critical thinking.

Problem solving exercises, identification of ions in unknown solutions and solids; writing of lab reports including analyzing data and evaluating results.

6. SELF REFLECTIVE LEARNING:

If applicable, describe how students will reflect on their development as active learners. Provide representative

examples below:

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7. COMPUTER COMPETENCY:

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

Internet research; use of interactive Web exercises; Use of Excel to graph and interpret data.

8. INFORMATION COMPETENCY:

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

Students will be asked to obtain and analyze data/information from experiments, tables, graphs and the Internet and use it to solve problems, express results and draw conclusions.

Evaluation and Instruction

9. REPRESENTATIVE OUTSIDE ASSIGNMENTS (HOMEWORK):

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

Internet research; Excel graphing and analysis of data; homework problems and Interactive Web assignments.

10. 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):

Written examinations, quizzes and lab reports. The analysis of experimental unknowns.

11. METHODS OF INSTRUCTION:

Please Check All That Apply

- Discussion
- Activity
- Field Experience
- Independent Study
- Purposeful Collaboration
- Other (Please Explain)

12. SUPPLIES:

List the supplies the student must provide.

Non-programmable scientific calculator; lab notebook; safety goggles.

13. DIVERSITY:

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

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

SCANS (Secretary's Commission on Necessary Skills) 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 <https://misweb.cccco.edu/webproginv/prod/invmenu.htm>..

CSU-General Education Certificate - Program: 490110 State ID: 18603
Gen.Studies:Science,Technology,Engineer& Math. AA - Program: 490200 State ID: 19182
IGETC - General Education Certificate - Program: 490111 State ID: 18604

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: **A. Natural Science** Approval Date: **6/4/12**

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://www.laccd.edu/board_rules/documents/Ch.VI-ArticleII.pdf

b. Area requested: **None**

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: **5A: Physical Science**
- 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: **B1: Physical Science**
- 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.

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IGETC Certification:

- a. Area requested:
- 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: **B3: Laboratory Activity**
- 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.

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3. MAJOR REQUIREMENT FOR TRANSFER:

Will this course be articulated to meet lower division major requirements? **No**

List college/university and the majors:

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CAN NUMBER:

CAN SEQUENCE #:

CAN Approval --

Date requested:

Date approved:

Section V: SUPPLEMENTAL COURSE INFORMATION

1. DEPT/DIVISION NAME: **Chemistry**
2. DEPT/DIVISION CODE: **25**
3. SUBJECT CODE : **183**
4. SUBJECT ABBREVIATION : **CHEM**
5. RECOMMENDED MINIMUM QUALIFICATION AREA:
6. ABBREVIATION FOR TRANSCRIPTS : **GENERAL CHEMISTRY II**
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: **Degree Applicable**

8. GRADING METHOD : **LETTER GRADE**
9. REPETITIONS: # of times repeated for credit : **0**

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 55000(j) 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**

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 W/ 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**

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: **Credit Course**

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) **1905.00**

Course content should match discipline description in Taxonomy of Programs found here: [Taxonomy Of Programs website](#)

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

18. FUNDING AGENCY CODE:

19. STATE COURSE ID:

Section VI: APPROVAL STATUS

1. APPROVAL STATUS:

	Approval Date Of	Board Date	Approved Effective Semester
a. <input type="checkbox"/> New Course	College:	Board: 4/9/93	Effective Semester:
b. <input type="checkbox"/> Addition of Existing District Course	College:	Board:	Effective Semester:
c. <input type="checkbox"/> Course Change*	College:		Effective Semester:
d. <input checked="" type="checkbox"/> Outline Update	College: 6/4/12		Effective Semester:
e. <input type="checkbox"/> Archive Course	College:		Effective Semester:
f. <input type="checkbox"/> Reinstate Course	College:	Board:	Effective Semester:

Section VII: APPROVAL INFORMATION FOR NEW OR ADDED COURSES

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

1. ORIGINATOR: **Ogar, George**

2. DEPARTMENT: **Chemistry**

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 course. 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

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:

A. Additional staff -- List additional staff needed:

B. Classroom -- List classroom type needed:

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

D. Supplies- List supplies and indicate dollar value:

E. 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 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	
Department/Cluster Chairperson	
Articulation Officer	
Librarian	
Dean (If applicable)	
Curriculum Committee Chairperson	
Academic Senate President	
Vice President, Academic Affairs	
College President	

Section VIII: ADDENDA

(Uploaded Documents)

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Type	Addendum Description	File	Delete	To View
<i>SLO Addendum</i>	<i>SLO Addendum</i>	<i>chem102slo.doc</i>	Delete	View It
<i>Prerequisite Document</i>	<i>Prerequisite Document</i>	<i>Chem101requisite.docx</i>	Delete	View It