FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER:	CHM 4411
COURSE TITLE:	Physical Chemistry II
PREREQUISITE(S):	CHM4410 (Physical Chemistry I) with a grade of "C" or better
COREQUISITE(S):	
CREDIT HOURS:	3
CONTACT HOURS/WEEK:	3
CONTACT HOUR BREAKDOWN:	
Lecture/Discussion:	3
Laboratory:	
Other _____:	
FACULTY WORKLOAD POINTS:	3
STANDARDIZED CLASS SIZE ALLOCATION:	35

CATALOG COURSE DESCRIPTION:

This course will cover the foundations of quantum mechanics, spectroscopy, chemical bonding and intermolecular forces, and photochemistry with an emphasis on how theses principles apply to protein structure and folding and other biological macromolecules and processes.

SUGGESTED TEXT(S):

Chang, Raymond, Physical Chemistry for the Biosciences, University Science Books, Latest edition

Kuhn, Hans, Forsterling, Horst-Dieter, Waldeck, David H., Principles of Physical Chemistry, John Wiley and Sons, Latest edition

SUGGESTED TEXT(S):	McQuarrie, Donald A., Simon, John D., Physcial Chemistry, A Molecular Approach, University Science Books, Latest edition Silbey, Robert J., Alberty, Robert A., Bawendi, Moungi G., Physical Chemistry, John Wiley and Sons, Latest edition Chang, Raymond, Physical Chemistry for the Chemical and Biological Sciences, University Science Books, Latest edition Levine, Ira N., Physical Chemistry, McGraw Hill, Latest edition Engel, Thomas, Reid, Philip, Physical Chemistry, Prentice Hall, Latest edition
IMPLEMENTATION DATE:	Fall Term, 2011 (20121)
REVIEW OR MODIFICATION DATE:	

COURSE TOPICS	CONTACT HOURS PER TOPIC
I. Introduction	1
II. Quantum Mechanics	12
a. Blackbody Radiation and the Photoelectric Effect	
b. Particle-Wave Duality	
c. Planck, Einstein, Bohr, de Broglie, Heisenberg, Schrodinger, etc.	
d. Particle in a 1D Box	
III. Spectroscopy	8
a. The Harmonic Oscillator and Rigid Rotator	
b. The Hydrogen Atom and Molecule	
c. Absorption and Emission Spectroscopies	
d. Microwave, Infrared, Visible, UV, Fluorescence, Phosphorescence, etc., Spectroscopies	10
IV. Chemical Bonding	
a. Lewis Structures	
b. Valence Bond Theory	
c. Electronegativity and Polarization	
d. Molecular Orbital Theory	
e. Diatomic Molecules	
f. Resonance and Electron Delocalization	
V. Intermolecular Forces	8
a. Intermolecular Interactions and their types	
b. Hydrogen Bonding	
c. Water	
d. Hydrophobic Interactions	
VI. Photochemistry	6
a. Primary versus Secondary Processes	
b. Photosynthesis	
c. Vision	
Total Lecture Hours:	45

Florida State College At Jacksonville

Course Learning Outcomes & Assessment

NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.

Section 1

COURSE PREFIX AND NUMBER: CHM 4411

SEMESTER CREDIT HOURS (CC): 3
CONTACT HOURS (NCC):

COURSE TITLE: Physical Chemistry II

Section 2

TYPE OF COURSE: (Click on the box to check all that apply)

- ☐ AA Elective
- ☐ AS Required Professional Course
- ☐ College Prep
- ☐ AS Professional Elective
- ☐ AAS Required Professional Course
- ☐ Technical Certificate
- ☒ Other B.S. Biomedical Sciences Upper Division Core Course
- ☐ PSAV
- ☐ Apprenticeship
- ☐ General Education: (For General Education courses, you must also complete Section 3 and Section 7)

Section 3 (If applicable)

INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:

- ☐ Communications
- ☐ Social & Behavioral Sciences
- ☐ Mathematics
- ☐ Natural Sciences
- ☐ Humanities

Section 4

INTELLECTUAL COMPETENCIES:

- ☐ Reading
- ☐ Speaking
- ☒ Critical Analysis
- ☒ Quantitative Skills
- ☒ Scientific Method of Inquiry
- ☐ Writing
- ☐ Listening
- ☐ Information Literacy
- ☐ Ethical Judgment
- ☐ Working Collaboratively

Section 5

STATE GENERAL EDUCATION LEARNING OUTCOME AREA

- ☐ Communication
- ☐ Critical Thinking
- ☐ Scientific and Quantitative Reasoning
- ☐ Information Literacy
- ☐ Global Sociocultural Responsibility

Section 6 **LEARNING OUTCOMES**		***Type of Outcome: Gen. Ed, Program, Course***	**METHOD OF ASSESSMENT**
•	Demonstrate knowledge of quantum mechanics, spectroscopy, and chemical bonding	Course	Methods of assessment can include exams, quizzes, papers, lab reports, lab practicals, and/or oral presentations
•	Demonstrate knowledge of intermolecular forces	Course	Methods of assessment can include exams, quizzes, papers, lab reports, lab practicals, and/or oral presentations
•	Demonstrate knowledge of photochemistry	Course	Methods of assessment can include exams, quizzes, papers, lab reports, lab practicals, and/or oral presentations
•	Demonstrate the application of interdisciplinary natural science curricula to biomedical sciences.	Program	Students will answer a set of questions developed by the program faculty and delivered across courses in the discipline. A faculty panel will evaluate the

			answers a common rubric with scores from 1 (not yet competent) to 3 (competent).
•	Conduct an experiment, collect and analyze data, and interpret results in a laboratory setting	Discipline	Students will answer a set of questions developed by the program faculty and delivered across courses in the discipline. A faculty panel will evaluate the answers a common rubric with scores from 1 (not yet competent) to 3 (competent).
•	Analyze, evaluate, and test a scientific hypothesis	Discipline	Students will answer a set of questions developed by the program faculty and delivered across courses in the discipline. A faculty panel will evaluate the answers a common rubric with scores from 1 (not yet competent) to 3 (competent).
•	Use basic scientific language and processes and be able to distinguish between scientific and non-scientific explanations	Discipline	Students will answer a set of questions developed by the program faculty and delivered across courses in the discipline. A faculty panel will evaluate the answers a common rubric with scores from 1 (not yet competent) to 3 (competent).
•	Identify unifying principles and repeatable patterns in nature, the values of natural diversity, and apply them to problems or issues of a scientific nature	Discipline	Students will answer a set of questions developed by the program faculty and delivered across courses in the discipline. A faculty panel will evaluate the answers a common rubric with scores from 1 (not yet competent) to 3 (competent).

Section 7

Name of Person Completing This Form: Stephen Lukacs, Ph.D. Date: December 17, 2010