FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER:	BSC 2930C
COURSE TITLE:	Biotechnology Testing Methods I
PREREQUISITE(S):	BSC 1404C
COREQUISITE(S):	None
CREDIT HOURS:	4
CONTACT HOURS/WEEK:	5
CONTACT HOUR BREAKDOWN:	
Lecture/Discussion:	3
Laboratory:	2
Other:	
FACULTY WORKLOAD POINTS:	4.4
STANDARDIZED CLASS SIZE ALLOCATION:	35

COURSE DESCRIPTION:

This course introduces students to the role analytical testing plays in standards verification. Students are introduced to strategies for concentrating and analyzing DNA and RNA, understanding sample matrix influences, chromatography theory, liquid chromatography, and regulatory oversight systems such as found at the Food and Drug Administration, U.S. Department of Agriculture, and the Environmental Protection.

SUGGESTED TEXT(S):	None
IMPLEMENTATION DATE:	Fall Term, 2008 (20091)
REVIEW OR MODIFICATION DATE:	

COURSE TOPICS		CONTACT HOURS PER TOPIC
I.	Cell Biology	10
	A. Molecular biology of prokaryotes (5)	
	B. Molecular biology of eukaryotes (5)	
II.	Biochemistry of Macromolecules	15
	A. DNA (5)	
	B. RNA (5)	
III.	Nucleic Acid Analysis	25
	A. Separation methods (5)	
	B. Quantitation methods (5)	
	C. Electrophoresis (5)	
	D. RNA cDNA conversion (5)	
	E. Probes (5)	
IV.	Sample processing strategies	10
	A. Sampling error, accuracy and precision (4)	
	B. Chain-of-custody (2)	
	C. Liquefaction and homogenization (2)	
	D. Concentration and clean up (2)	
V.	Analytical Methodology	15
	A. Thin Layer Chromatography (5)	
	B. High Performance Liquid Chromatography (5)	
	C. Spectroscopy (5)	

PROGRAM TITLE: Biotechnology Laboratory Technology

COURSE TITLE: Biotechnology Testing Methods I

CIP NUMBER: 1626.061600

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S):	TITLES(S):
1.1.1	Ability to interact with vendors, colleagues, scientists
1.1.2	Notify appropriate persons about problems and observations
1.1.3	Coordinate tasks with coworkers
1.1.4	Make oral and written presentations
1.2.1	Comprehend and use technical vocabulary
1.2.2	Document results at the time of performance
1.3.1	Take notes on procedures
1.3.2	Prepare, identify, and apply changes to control procedures
1.3.3	Employ scientific writing techniques
1.4.1	Perform computerized research and web searches
1.4.2	Read technical literature
1.4.3	Identify basic reference sources in biotechnology
2.1.1	Identify first aid supplies, co-worker contact, medical information, emergency protection, and evacuation plan
2.1.2	Follow correct safety procedures, guidelines, and chemical hygiene plans
2.1.3	Maintain required safety training; observe rules of electric and equipment safety; recognize common lab hazards
2.1.4	Maintain and utilize safety equipment and personal protection equipment (PPES)
2.2.1	Check expiration dates, lot numbers, and labels for hazards
2.2.2	Monitor usage and exposure of radioisotopes and biohazards
2.2.3	Follow universal precautions for biological pathogens; store chemicals and biologicals according to storage guidelines.

LIST PERFORMANCE STANDARD ADDRESSED: (continued)

NUMBER(S): TITLES(S):

3.1 Obtain and read protocol, test procedure, standard operating procedure and proper forms.

3.1.1 Apply scientific methods

3.1.2 Recognize and follow documentation requirements

3.1.3 Design and troubleshoot procedures and/or tests

3.1.4 Prioritize and perform multiple tasks in a timely manner

3.2.1 Check and maintain equipment, logs, and perform preventive maintenance tasks according to schedule

3.2.2 Clean, organize, and sterilize materials when required

3.2.3 Order inventory of supplies and reagents; date/label reagents

3.3.1 Practice aseptic techniques

3.3.2 Use titration/pipetting techniques; measure volume/weights

3.3.3 Perform basic calculations and statistical analysis

3.3.4 Calculate and prepare dilution series

3.3.5 Monitor physical properties of reagents, buffers, media and solutions and determine optimum conditions for use

3.4.1 Obtain and review appropriate procedures and test forms

3.4.2 Collect and set up samples for analysis

3.4.3 Set-up equipment and perform/document tests and results

3.5 Operate laboratory equipment

4.1 Accept federal regulations

4.1.1 Follow the guidelines from the following agencies: FDA, OSHA, USDA, NIH, NR, DOT, EPA, CDC, NRC

4.1.2 Follow regulations from Clinical Lab Improvement (CLIA, 88, Amendment of 1988 Protein tech skills) and Drug Enforcement Administration

4.2.1 Follow and observe HAZMAT Guidelines

4.2.2 Follow and observe country and state environmental protection guidelines

4.2.3 Perform manufacturing using current good manufacturing practices (GMP)

LIST PERFORMANCE STANDARD ADDRESSED: (continued)

NUMBER(S):	TITLES(S):
5.1	Apply decision making techniques in the workplace
5.1.1	Identify decision to be made and compare alternatives
5.1.2	Make decision based on values and goals and evaluate decision made
5.2.1	Diagnose problem, its urgency, and causes
5.2.2	Be sensitive to multicultural and nonsexist dimensions of problem solving
5.2.3	Explore possible solutions to a problem and compare/contrast advantages
5.2.4	Determine appropriate action; implement it and evaluate results
6.4.1	Probe and analyze DNA library
6.4.2	Construct recombinant vectors
6.4.3	Perform transformation techniques
6.4.4	Perform polymerase chain reaction
6.4.5	Perform translation assays
6.4.6	Isolate and analyze nucleic acid isolation
6.4.7	Transcribe DNA
6.4.8	Perform electrophoresis on RNA, DNA, and protein
6.4.9	Perform nucleic acid hybridization
6.4.11	Perform non-isotopes techniques
6.6	Perform chemical assays
6.6.1	Perform quantitative analysis and distillation techniques
6.6.2	Perform titration techniques (manual and automatic)
6.6.3	Employ dyes and indicators
6.6.4	Perform lypholization and organic chemistry techniques
6.6.5	Perform extractions
6.6.6	Measure turbidity, viscosity, and density

LIST PERFORMANCE STANDARD ADDRESSED: (continued)

NUMBER(S): TITLES(S):

7.1.1 Perform quality tests and document results

7.1.2 Verify test standards and maintain QA records

7.1.3 Archive samples and documents

8.1 Monitor and record the environmental conditions of the facility (growth chamber, greenhouse, seed storage room, animal room, or manufacturing site)

8.1.1 Sample environment, clean work area according to SOP's and document room integrity.

8.1.2 Notify appropriate personal if sampling indicates a problem.

Florida State College At Jacksonville

Course Learning Outcomes & Assessment
For All College Credit Courses

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: BSC 2930C

SEMESTER CREDIT HOURS: 4

COURSE TITLE: Biotechnology Testing Methods I

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 _____
- ☐ 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:

- ☐ Communication
- ☐ 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

LEARNING OUTCOMES	METHOD OF ASSESSMENT
• Explain and apply techniques of fundamental molecular biology, including manipulation of nucleic acids and bacterial cells.	Written tests, reports and/or use of equipment to demonstrate student competency in field.
• Demonstrate knowledge of scientific method.	Formulate problem, make observations, derive and test hypothesis and make conclusions.
• Communicate scientific ideas through oral or written assignments.	Students use analytical reasoning skills to solve problems on written tests and/or laboratory work.
• Interpret scientific models such as formulas, graphs, tables and schematics, draw inferences from them and recognize their limitations.	Written reports of lab experiments and/or written tests demonstrate student competency in the application of scientific knowledge.
• Demonstrate problem solving methods in situations that are encountered outside of the classroom.	Students use demonstrations, group discussions, written tests, laboratory reports, research projects and/or field experiences to illustrate competence in recognizing and evaluating various scientific processes.
• Demonstrate proper laboratory technique including safety in the use and care of laboratory equipment and materials.	Results from laboratory work and experiments demonstrate student awareness of science and society.

Section 6

Name of Person Completing This Form: Kevin Pegg Date: 1/28/2008