CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

NEW COURSE PROPOSAL

PROGRAM AREA _____BIOLOGY_____

1. **Catalog Description of the Course.** *[Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of ___ units); time distribution (Lecture ___ hours, laboratory ___ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]*

   BIOL 422. MOLECULAR PLANT PHYSIOLOGY (4)
   Three hours of lecture and three hours of laboratory per week.
   Prerequisite: CHEM 318 or 400; BIOL 300 with a grade of C or better.
   Study of principles and methods of plant physiology at the molecular level combined with modern plant technology. Topics include plant tissue and cell culture, genetic engineering and transformation, plant defense, genomics and applications of DNA technology. A lab fee is required.

2. **Mode of Instruction.**

	Units	**Hours per Unit**	**Benchmark Enrollment**
Lecture	_____3___	_____1__	_____24__
Seminar	_____	_____	_____
Laboratory	____1____	_____3_	_____24_
Activity	_____	_____	_____

3. **Justification and Learning Objectives for the Course.** (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*

   BIOL 422 is an elective course for Biology students. This is an advanced course which will be of interest to students desiring an in-depth treatment of Plant Physiology at the molecular level.

   Students who successfully complete this course will be able to:

   - Explain the process of photosynthesis at the molecular level
   - Describe the structure and function of plant cells
   - Explain growth, development and differentiation in plants
   - Discuss applications of biotechnology to plant research
   - Generate a hypothesis from a set of observations and then design experiments to test the hypothesis

4. **Is this a General Education Course** **YES** **NO**
   If Yes, indicate GE category:

A (English Language, Communication, Critical Thinking)	
B (Life Sciences)	
C (Fine Arts, Literature, Languages & Cultures)	
D (Social Perspectives)	
E (Human Psychological and Physiological Perspectives)	

5. **Course Content in Outline Form.** *[Be as brief as possible, but use as much space as necessary]*

   Plant and Cell Architecture
   Energy and Enzymes

Water and Plant Cells
Water Balance of the Plant
Mineral Nutrition
Solute Transport
Photosynthesis: The Light Reactions
Photosynthesis: Carbon Reactions
Photosynthesis: Physiological and Ecological Considerations
Translocation in the Phloem
Respiration and Lipid Metabolism
Assimilation of Mineral Nutrients
Plant Defenses: Surface Protection and Secondary Metabolites
Gene Expression and Signal Transduction
Cell Walls: Structure, Biogenesis, and Expansion
Growth, Development, and Differentiation
Phytochrome
Blue-Light Responses: Stomatal Movements and Morphogenesis
Plant tissue and cell culture
Genetic engineering and transformation, genomics and applications of DNA technology

6. References. *[Provide 3 - 5 references on which this course is based and/or support it.]*

Buchanan, B., Gruissem, W., and Jones, R.L. *Biochemistry and Molecular Biology of Plants*. (2002). John Wiley and Sons.
Taiz, L. *Plant Physiology*, 3rd Edition. (2002). Sinauer.
Salisbury, F. *Plant Physiology*, 4th edition. (1992). Brooks/Cole Publishing.

7. List Faculty Qualified to Teach This Course.
Biology faculty

8. Frequency.
a. Projected semesters to be offered: Fall _____ Spring __x___ Summer _____

9. New Resources Required.
a. Computer (data processing), audio visual, broadcasting needs, other equipment
b. Library needs
c. Facility/space needs
Biology teaching laboratory with standard laboratory equipment and supplies.

10. Consultation.
Attach consultation sheet from all program areas, Library, and others (if necessary)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

___Nancy Mozingo_____6 January 2003_____
Proposer of Course Date