CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

NEW COURSE PROPOSAL

PROGRAM AREAS _____BIOLOGICAL AND PHYSICAL SCIENCES, MATH AND COMPUTER SCIENCE

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.]*

   COMP 151. DATA STRUCTURES AND PROGRAM DESIGN (4)
   Four hours of lecture in the lab per week.
   Prerequisite: COMP 150.
   Introduction to data structures and the algorithms that use them. Review of composite data types such as arrays, records, strings, and sets. Topics include: the role of the abstract data type in program design.; definition, implementation and application of data structures such as stacks, queues, linked lists, trees and graphs; recursion; use of time-complexity expressions in evaluating algorithms.; comparative study of sorting and searching algorithms.

2. **Mode of Instruction.**

	Units	**Hours per Unit**	**Benchmark Enrollment**
Lecture	___4_____	___1_____	__24_____
Seminar	_____	_____	_____
Laboratory	_____	_____	_____
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]*

   The course is a required course for Computer Science majors according to accreditation guidelines.

   Through this course, students will be able to

   - Demonstrate the role of abstract data types and data structures
   - Describe the common container attributes of different data structures
   - Determine the time complexity of an algorithm
   - Discuss the time-space trade-offs often required in algorithm design
   - Organize and express ideas clearly and convincingly in oral and written forms.

   This course is not designed to satisfy the University Writing or Language requirements.

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

A (English Language, Communication, Critical Thinking)	
B (Mathematics & 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]*

Arrays and vectors
Linked lists, with arrays and with nodes and linked structures
Recursion
Hash tables
Time complexity of algorithms
Stacks and Queues
Sorting
Binary trees, search trees, balanced trees
Heaps, heapsort
Graphs

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

Carrano and Prichard, *Data abstraction and problem solving with Java*, *Walls and mirrors*, Addison-Wesley, 2001 ISBN 0201702207
Sedgewick/Schidlowsky *Algorithms in Java* 3rd edition, Addison-Wesley, 2002 ISBN 0201361205
Dale, Joyce, Weems and Rebelsky, *Data structures in Java*, Jones and Bartlett (2002) ISBN 0763710792

7. List Faculty Qualified to Teach This Course.

All Computer Science faculty.

8. Frequency.

a. Projected semesters to be offered: Fall ___X__ Spring _X____ Summer ___X__

9. New Resources Required.

a. Computer (data processing), audio visual, broadcasting needs, other equipment

Use of existing computer lab.

b. Library needs

none

c. Facility/space needs

none

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.

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Proposer of Course Date