## NEW COURSE APPROVAL FORM - Page 1 of

Course title: CS 260 Data Structures

X\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Supervisor Signature:

Division CTE Department Engineering and CIS Program Engineering

Course No CIS 260 Title Data Structures Terms Offered S

Credits 4 Lecture hrs/wk 3 Lec/Lab hrs/wk 2 Lab hrs/wk       Practicum hrs/wk

Banner Pre-req. MTH 95 Instructor Pre-req.       Co-requisites      .Length (wks) 11

Proposed implementation date Term W Year 2014 Grading Option A-F Load Factor 4.4

Catalog Course Description: This course is intended primarily for students seriously interested in computer science. Students will demonstrate the usage of using advanced data structures, including linked-lists and tree structures using pointers, and advanced structure programming methods through a variety of programming projects. Course may be offered online. Banner Enforced Prerequisite: CS162 and MTH 111 or higher of instructor approval.

VOCATIONAL TECHNICAL PROPOSALS ONLY LOWER DIVISION COLLEGIATE PROPOSALS ONLY

Approved by Advisory Committee (Minutes Attached):

Is this course on the "LDC Course List" of the State Department  To be  Yes No

If no, this course has been approved for transfer to: (college or university) (attached syllabus, course description, and outcomes)

Occupational Preparatory (organized degree/cert program)

Occupational Supplementary

## NEW COURSE APPROVAL FORM - Page2 of

**Support Course:** Indicate all programs for which this course will be required.

|  |  |  |
| --- | --- | --- |
| **PROGRAM** | **DEPARTMENT** | **DATE** |
| Engineering | Engineering and CIS | Fall 2014 |
|  |  |  |
|  |  |  |

**Overlap** Indicate departments and courses

None

COURSE DEVELOPED BY Clay Baumgartner DATE: 10/8/2013

**ATTACH the documents below:**

* COMPLETE COURSE OUTLINE
* **COMPLETE NEW COURSE JUSTIFICATION FORM**

## COURSE OUTLINE – Page 1 of

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Course No: CS 260

Course Credit: 4

Lecture Hrs/wk: 3

Lab Hrs/Wk: 0

Lecture/Lab Hrs/Wk: 2

Practicum Hrs/Wk: 0

Clock Hours: 55

Length of Course 11 weeks

Banner enforced Prerequisite: CS162 and

MTH111

Instructor enforced Prerequisite:

Co-Requisite:

Load Factor:    4.4

Activity Code:

CIPS:

Course Title: Data Structures

Developed By: Clay Baumgartner

Development Date: 11/3/2013

Revision Date:

COURSE DESCRIPTION:

This course is intended primarily for students seriously interested in computer science. Students will demonstrate the usage of using advanced data structures, including linked-lists and tree structures using pointers, and advanced structure programming methods through a variety of programming projects. Course may be offered online. Banner Enforced Prerequisite: CS162 and MTH 111 or higher of instructor approval.

COURSE OUTCOMES:

1. Define and implement data structures including stacks, queues, linked lists, trees, hash tables, and graphs.
2. Program recursively and define how recursion works
3. Measure and analyze algorithms for efficiency considerations
4. Define and implement multiple search and sort algorithms
5. Select the appropriate data structure and algorithm for a given problem

REQUIRED TEXT/MATERIALS:

Data Structures & Algorithms in Java, 2nd Edition, Robert Lafore, or current edition

## COURSE OUTLINE – Page 2 of 2

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OUTLINE: [Topics taught by week 1-10.]

Week 1 Introduction, Arrays, Simple Sorts

Week 2 Stacks and Queues as implemented using arrays (Single and double ended queues, priority queues)

Week 3 Linked Lists, how to implement them (single linked, double linked, single ended, double ended, circular), how to implement stacks and queues using them

Week 4 Recursion, Partitioning, Shell & Quick Sort

Week 5 Binary trees, how to implement them, traversals, conversion from infix to postfix to prefix, binary search trees

Week 6 Red Black Trees, 234 Trees, Midterm

Week 7 Hash Tables & Heaps -- how to use heaps for heapsort, priority queues

Week 8 Graphs in general, directed graphs specifically, breadth first and depth first traversals, min-spanning trees

Week 9 Weighted graphs

Week 10 Intractable problems, P & NP, Review

**NEW COURSE JUSTIFICATION – Page 1 of 1**

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**New Course title:** CS 260 Data Structures

X\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Supervisor Signature:

CS 260 Data Structures

**Student need for course:** Required course for Electrical and Computer Engineering Majors and course for students interested in transferring in computer science related majors.

**Course Information:**

AA AS AAS  Below 100 level Elective  Certificate

AAOT (Area of distribution): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Cost of this course:**

No additional instructional costs (staff, material, equipment, or facilities) are required. The cost of this course will be covered by (i.e. fewer sections of course):

Hosted by LCC. Students will take course online

Additional instructional costs (staff, materials, equipment or facilities) are needed to offer this course. Itemize and estimate:

**Course impact on**:

a. Student enrollment in other courses: None.

b. Current program: Will increase enrollment in engineering program

Replacement course for: Course Number:       Title:

**Disposition: Signature Date Recommendation**

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Curriculum Committee Chair Vice President of Instruction