FITCHBURG STATE UNIVERSITY

Academic Year 2021-2020 GCE#21-22-* 01

Graduate Course Change Proposal

Course Information

Course Title: * Advanced Programming

Existing Banner Abbreviation: * Advanced Programming

Proposed Banner Abbreviation: * Advanced Programming

Banner limit of 30 characters, including punctuation, spaces, and special characters.

Extended Campus Course? *
- ○ Yes
- ◉ No

Department/Committee Information

The main contact person for the Graduate Curriculum Committee should fill out this form.

Requestor Name: * Xuzhou Chen

Members of the Graduate Curriculum Committee: Natasha Kourtonia, Ricky Sethi, Kevin Austin, Robin Chataut, Nadimpalli Mahadev

Department / Unit Developing: * Computer Science

Chair of Department for Program: * Chen

Chair Email: * xchen@fitchburgstate.edu

Academic Dean of Department or Program: * Margaret Hoey

Academic Dean E-mail: * <Dr. Hoey> mhoey@fitchbur

Course Revision & Rationale

Nature of the Course Revision:

- ☐ Level
- ☐ Credits
- ☑ Prerequisites
- ☐ Additional Requirements
- ☐ Title
- ☐ Description
- ☐ Other (Please Specify):

Course Revision Details

Please provide current and proposed versions

* Course description from the catalog:
This course covers the most essential concepts of modern Computer Programming with Python, Java and C programming languages. It starts with core computer science topics typically found in an undergraduate Computer Science curriculum, but at a graduate-level pace. Python programming language will be used as a tool for implementing advanced programming techniques and algorithms. Object Oriented Paradigm will be presented with Java. Finally, dynamic memory management, pointers and dynamic structures will be explored in C. This course provides a solid background for further graduate level software classes.

All the students who are accepted to the MS computer science program are required to take the placement test for Java and C programming languages. Based on the newly proposed rule, students who want to sign up for this course CSC7131 Advance Programming must either have the placement test Test score of 35 or higher or CSC 1500 with a grade of 1.0 or higher.

Rationale and expected outcomes of course change

*In Grad Council 20-21-44 we have updated all graduate CSC prerequisites to either pass the placement test (The score of 45 or higher) or CSC7131 Advanced Programming. We will accordingly change the rule for newly accepted students as following:
1. If students pass the placement test (with score of 45 or higher), they can take most of our graduate courses.
2. If students' placement test score is 35 or higher but less than 45, they need to take this CSC7131 Advance courses
3. If students' placement test score is less than 35, they need to take the undergraduate CSC1500 first and then take CSC7131 Advanced Programming.

Because of this rule changes, we would like to add the following prerequisites for CSC7131:
have the placement test Test score of 35 or higher or CSC 1500 with a grade of 1.0 or higher.

Course Syllabus

A syllabus is required when there is a change that impacts 50% or more of the current course content and curriculum or there is a change to the format of the syllabus that is outside of the University guidelines for graduate syllabi.

New Course Syllabus Upload: CSC7131Syllabus.pdf

Signatures

*Click on the **Submit Form** button at the bottom of the page after you have signed the form.*
You should receive an email confirmation that your signature has been completed.

* ...3334323132
Xuzhou Chen — 09/19/2021
Requestor Signature: Date

* ...3933383334
Xuzhou Chen — 09/30/2021
Department Chair Approval: Date

* ...3835313939
Margaret Hoey — 10/01/2021
Academic Dean Signature: Date

* ...3535383639
Becky Copper Glenz — 10/01/2021
SGOCE Dean Signature: Date

Approval of the Graduate Council — Date

Approval of the President — Date

Notification

Reviewed by the Registrar: _____

Reviewed by the Library: _____

SGOCE Admin. Assistant Signature: Electronically signed by Diane Fors on 10/01/2021 8:31:51 AM

Syllabus

CSC 7131 Advanced Programming

Course Description

This course covers the most essential concepts of modern Computer Programming with Python, Java and C programming languages. It starts with core computer science topics typically found in an undergraduate Computer Science curriculum, but at a graduate-level pace. Python programming language will be used as a tool for implementing advanced programming techniques and algorithms. Object Oriented Paradigm will be presented with Java. Finally, dynamic memory management, pointers and dynamic structures will be explored in C.

This course provides a solid background for further graduate level software classes.

Textbooks

Think Python: How to Think Like a Computer Scientist 2nd Edition
by Allen B. Downey
ISBN-13: 978-1491939369
ISBN-10: 1491939362

Java : The Complete Reference, 10Th Edition by Herbert Schildt
ISBN-13: 978-9387432291
ISBN-10: 9789387432291

C Programming Language, 2nd Edition
by Brian W. Kernighan and Dennis M. Ritchie
ISBN: 01311036

Major Topics Covered in the Course

1. Programming paradigms. Introduction to fundamentals of computer programming in Python.
2. The concept of data types. Variables, assignments, operators and expressions in Python. Control statements and basic algorithms
3. String manipulations in Python: subscript operator, indexing, slicing a string, converting strings to numbers and vice versa. Strings and text files: manipulating files and directories.
4. Lists, tuples, and dictionaries. Basic searching and sorting techniques.
5. Structured programming and functions in Python. Algorithms and recursive functions.
6. Graphics and Image Processing in Python: “turtle” module, 2d drawing and image processing.
7. Fundamentals of Object Oriented Programming. Introduction to Java programming language.

8. Encapsulation, objects and classes in Java. Principles of Object oriented design.
9. Creating and Destroying objects in Java. Constructors and Garbage Collections.
10. Methods and classes in Java.
11. Inheritance and Polymorphism. Designing an Interface.
12. GUI and Event-driven programming in Java.
13. Threads, Processes and Multitasking in Java.
14. An Overview and history of C programming Language
15. Pointers, dynamic memory allocation, reference and dereference, malloc and calloc functions.
16. Arrays and Pointer Arithmetic in C.
17. Functions in C. Pointers as arguments and return types. Passing parameters by value and by reference.
18. Fundamental Linked List Algorithms in C: sorting, searching, deleting and adding nodes.
19. Representing Trees and various Graphs in C.
20. C and Fundamentals of Systems Programming. Programming UNIX processors.

Grading Policy

Graded assignments	50%
Exams	50%

I will calculate the final grades as follows:

FSU Grade	Letter grade Equivalency	100 Point Equivalency
4.0	A	95-100
3.7	A-	92-94
3.5	A-/B+	89-91
3.3	B+	86-88
3.0	B	83-85
2.7	B-	80-82
2.5	B-/C+	77-79
2.3	C+	74-76
2.0	C	71-73
0.0	F	0-70
W	Withdraw	65-66
IN	Incomplete	
IP	In-Progress	

How to get help in case your homework program does not run or you don't understand some essentials covered during the class?

Please contact your professor at any time via e-mail, visit him/her during my office hours or make an appointment for some other time.

Late submission and Acknowledgements

1. If you submit your assignment one day late, 10% of your grade will be deducted. After that you have one week to submit your assignment, but 40% of your grade will be deducted. No assignments are accepted after one week after the deadline!
2. If somebody helped you with your homework, you have to mention his/her name in the introductory comments for your projects.

Attendance Policy

Attendance is required. In case of extensive absence, a student will be given extra assignment and extra exam covering the topics that he/she missed.

Academic Integrity Policy

Every member of the university community is expected to maintain the highest standards of academic integrity. A student shall not submit work that is falsified or is not the result of the student's own effort. A student who is in doubt regarding standards of academic integrity in a course or assignment should consult the faculty member responsible for that course or assignment before submitting the work. A student's lack of understanding of the academic integrity policy is not a valid defense to a charge of academic dishonesty.

A student's name on any written or creative exercise (e.g., examination, report, thesis, theme, laboratory report, computer program, artistic production, etc.), or in association with an oral presentation, declares that the work is the result of that student's own thought and study. Any work that the student declares as their own shall be stated in the student's own words and produced without the assistance of others. Students must make clear through accurate citations when they make use of other sources. Talking during an examination, or possession or use of unauthorized materials or equipment during an examination constitutes an infringement of the academic integrity policy. Aiding and abetting academic dishonesty also constitutes a violation of the academic integrity policy.

Unless permission is received in advance from the faculty member in charge of the course involved, a student may not submit, in identical or similar form, work for one course that has been used to fulfill any academic requirement in another course at Fitchburg State University or any other institution. A student who perceives the possibility of overlapping assignments in courses should consult with the appropriate faculty members before presuming that a single effort will fulfill requirements of both courses. Students should consult course syllabi for additional guidance on matters of academic integrity.

Learning Disabilities.

Every attempt will be made to accommodate students with documented disabilities provided accommodation must be requested before the 2nd class meeting.