



**FLORIDA INTERNATIONAL UNIVERSITY
UNIVERSITY CURRICULUM COMMITTEE**
Proposal for a Course Change

DO NOT TYPE IN THIS BOX

Bulletin #: _____

Academic Year: _____

PART I. FILL OUT THIS SECTION COMPLETELY

1. School/College _____
Div./Dept. in Which Taught _____

2. _____
Alpha Prefix 1st Digit Last 3 Digits "C"-lec-lab "L"-Lab Cr. Hrs.

3. Present Course Title _____

PART II. FILL OUT CHANGE INFORMATION ONLY

Change Effective ____ / ____ / 20__

4a. New Course Title _____

b. New Abbreviated course Title *(for computer class schedules, transcripts)*
LIMITED TO 25 Characters (including spaces)

5a. _____
New Alpha Prefix New 1st Digit New Last 3 Digits Change "C"-lec-lab "L"-Lab

5b. Change Credit Hours: From ____ To ____

6. **New Catalog Description/Major Topics** *(not to exceed 200 characters including spaces)*
College of Medicine and College of Law: Attach description not exceeding 1,000 characters including spaces.

7. New Prerequisite(s): _____

8. New Corequisite(s): _____

9. **Explain Reclassification Request:**

10. Does this proposed change impact the assessment process of a program or certificate? If yes, then send notification to assessment@fiu.edu.

PROPOSAL REQUESTED BY:

Faculty Contact _____ / ____ / 20__
(Type name) (Signature)

(Email address) (Phone number)

Chairperson (Dept./Div.) _____ / ____ / 20__
(Type name) (Signature)

Chairperson (Curr. Comm.) _____ / ____ / 20__
(Type name) (Signature)

College/School Dean _____ / ____ / 20__
(Type name) (Signature)

Submit one original form. Attach one copy of the course justification and course syllabus: course description, objectives, learning outcomes, major topics and textbooks.

School of Computing and Information Sciences

Course Title: Theory of Algorithms

Date: March 18, 2019

Course Number: MAD 3512

Number of Credits: 3

Subject Area: Foundations	Subject Area Coordinator: Geoffrey Smith email: smithg@cis.fiu.edu
Catalog Description: Strings, formal languages, finite state machines, Turing machines, primitive recursive and recursive functions, recursive unsolvability.	
Typical Textbook: Peter Linz, <i>An Introduction to Formal Languages and Automata, Third Edition</i> . (Jones and Bartlett, 2001)	
References:	
Prerequisite Courses: COP 3530	
Corequisite Courses: None	

Type: Required

Prerequisites Topics:

- Familiarity with definitions and theorems involving sets, relations, and functions.
- Familiarity with mathematical induction and recursion.
- Familiarity with formal proofs.

Course Outcomes:

- O1. Be familiar with formal languages.
- O2. Master finite state machines.
- O3. Master Turing machines.
- O4. Be familiar with primitive recursive and recursive functions.
- O5. Be exposed to recursive unsolvability.

School of Computing and Information Sciences
MAD 3512
Theory of Algorithms

Outline

Topic	Number of Lecture Hours	Outcome
1. <u>Regular Languages</u> 1.1. Regular Expressions 1.2. Regular Grammars 1.3. Deterministic Finite Automata 1.4. Nondeterministic Finite Automata 1.5. Minimizing DFAs 1.6. Closure and decidability properties 1.7. The pumping lemma for regular languages	<u>24</u>	<u>O1, O2</u>
2. <u>Context-Free Languages</u> 2.1. Context-free grammars 2.2. Parsing and ambiguity	<u>4</u>	<u>O1</u>
3. <u>Recursive and Recursively Enumerable Languages</u> 3.1. Turing Machines 3.2. The Church-Turing Thesis 3.3. A Universal Turing Machine 3.4. Undecidable problems	<u>8</u>	<u>O3, O5</u>
4. <u>Other Models of Computation</u> 4.1. Recursive Functions 4.2. Primitive Recursive Functions	<u>4</u>	<u>O4</u>

Course Outcomes Emphasized in Laboratory Projects / Assignments

Outcome	Number of Weeks
O1	4
O2	4
O3	2
O4	1
O5	2

Oral and Written Communication:

No significant coverage

Social and Ethical Implications of Computing Topics

No significant coverage

School of Computing and Information Sciences
MAD 3512
Theory of Algorithms

Approximate number of credit hours devoted to fundamental CS topics

Topic	Core Hours	Advanced Hours
Algorithms:		1.0
Software Design:		
Computer Organization and Architecture:		
Data Structures:		
Concepts of Programming Languages:		

Theoretical Contents

Topic	Class time
Formal languages and automata	40 hours

Problem Analysis Experiences

No significant coverage

Solution Design Experiences

No significant coverage

The Coverage of Knowledge Units within Computer Science Body of Knowledge¹

Knowledge Unit	Topic	Lecture Hours
AL5. Basic computability	1, 2, 3, 4	20
AL7. Automata theory	1, 2, 3, 4	20

¹See <http://www.computer.org/education/cc2001/final/chapter05.htm> for a description of Computer Science Knowledge units