

CSC 135: COMPUTABILITY AND FORMAL LANGUAGES

In Workflow

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Approval Path

1. Thu, 20 Jan 2022 18:15:47 GMT
Anna Baynes (shaverdian): Approved for CSC Committee Chair
2. Thu, 20 Jan 2022 18:43:44 GMT
Nikrouz Faroughi (faroughi): Approved for CSC Chair
3. Fri, 28 Jan 2022 18:08:01 GMT
Mohammed Eltayeb (mohammed.eltayeb): Approved for ECS College Committee Chair
4. Fri, 28 Jan 2022 18:22:35 GMT
Behnam Arad (arad): Approved for ECS Dean

History

1. May 10, 2021 by Ted Krovetz (tdk)

Date Submitted: Thu, 20 Jan 2022 09:03:28 GMT

Viewing: CSC 135 : Computability and Formal Languages

Last approved: Mon, 10 May 2021 22:19:36 GMT

Last edit: Fri, 28 Jan 2022 18:05:41 GMT

Changes proposed by: Ted Krovetz (101058577)

Contact(s):

Name (First Last)	Email	Phone 999-999-9999
Ted Krovetz	tdk@csus.edu	530-400-9743

Catalog Title:

Computability and Formal Languages

Class Schedule Title:

Computability and Formal Lang

Academic Group: (College)

ECS - Engineering & Computer Science

Academic Organization: (Department)

Computer Science

Will this course be offered through the College of Continuing Education (CCE)?

No

Catalog Year Effective:

Fall 2022 (2022/2023 Catalog)

Subject Area: (prefix)

CSC - Computer Science

Catalog Number: (course number)

135

Course ID: (For administrative use only.)

201850

Units:

3

Is the primary purpose of this change to update the term typically offered or the enforcement of prerequisites at registration?

No

In what term(s) will this course typically be offered?

Fall, Spring

Does this course require a room for its final exam?

Yes, final exam requires a room

Does this course replace an existing experimental course?

No

This course complies with the credit hour policy:

Yes

Justification for course proposal:

Correction of typographical errors in catalog description and catalog title only. Changing the course title to match the class schedule title.

Course Description: (Not to exceed 80 words and language should conform to catalog copy.)

Introduction to limits of computation and techniques for specifying and processing formal languages. Regular languages, regular expressions, finite automata, properties and limitations. Context-free languages, grammars, pushdown automata, properties and limitations. Applications in lexical and syntax analyses, including recursive-descent or table-driven parsing. Turing machines, halting problem, reductions. Introduction to functional programming and related programming language features.

Are one or more field trips required with this course?

No

Fee Course?

No

Is this course designated as Service Learning?

No

Does this course require safety training?

No

Does this course require personal protective equipment (PPE)?

No

Does this course have prerequisites?

Yes

Prerequisite:

CSC 28, CSC 35, CSC 130, and not currently enrolled in CSC 135.

Prerequisites Enforced at Registration?

Yes

Does this course have corequisites?

No

Graded:

Letter

Approval required for enrollment?

No Approval Required

Course Component(s) and Classification(s):

Lecture

Lecture Classification

CS#02 - Lecture/Discussion (K-factor=1WTU per unit)

Lecture Units

3

Is this a paired course?

No

Is this course crosslisted?

No

Can this course be repeated for credit?

No

Can the course be taken for credit more than once during the same term?

No

Description of the Expected Learning Outcomes: Describe outcomes using the following format: "Students will be able to: 1), 2), etc."

Students completing this course will be able to

1. Design generators and recognizers for simple regular and context-free languages and give examples of algorithmically converting from one to the other;
2. Demonstrate a context-free grammar ambiguous using parse trees;
3. Explain the limits of regular and context-free languages and apply a pumping lemma to show a language not to be regular and/or context-free;
4. Discuss parsing and scanning techniques including the principle of longest substring, recursive-descent or table-driven parsing, derivations, parse trees, first and follow sets;
5. List the main phases of a compiler, and the function of each;
6. Explain functional programming language features and their use, including immutability, higher-order functions, lambda functions, dynamic type systems, and tail recursion;
7. Develop solutions to simple problems using a functional programming language; and
8. Describe the importance of Turing machines, the halting problem, and reductions that prove certain problems cannot be solved by computer algorithms.

Attach a list of the required/recommended course readings and activities:

135_23SEP2020.docx

Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above.

Outcomes 1-8 are assessed via regular quizzes, exams, and a final exam. Outcome 7 is also assessed via graded programming assignments.

Is this course required in a degree program (major, minor, graduate degree, certificate?)

Yes

Has a corresponding Program Change been submitted to Workflow?

No

Identify the program(s) in which this course is required:**Programs:**

BS in Computer Science

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Undergraduate Learning Goals:

Intellectual and practical skills

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

GE Course and GE Goal(s)

Is this a General Education (GE) course or is it being considered for GE?

No

Key: 1038