School of Computing
UNIVERSITY OF GEORGIA

Course Information Sheet
CSCI 4840
Signal Processing

Brief Course Description
(50-words or less)

Introduction to signal processing. Students will learn basic concepts, algorithms and software tools for multidimensional signal representation, processing and analysis. 1D, 2D, 3D and 4D signal processing techniques and applications will be discussed.

Extended Course Description / Comments

Use this section to put additional information that's relevant to whom this course is targeting

Pre-Requisites and/or Co-Requisites

The course is appropriate both for students preparing for research in signal processing, as well as image processing, Science and Engineering students who want to apply signal processing techniques to solve problems in their fields of study.

CSCI 2720
Data Structures

Approved Textbooks
(If more than one, course text used during a semester is at the discretion of the instructor)

Author(s): Jonathan Blackledge
Title: Digital Signal Processing
Edition: Second Edition, 2006
ISBN: -904275-26-5

Specific Learning Outcomes (Performance Indicators)

These are a (non-exhaustive) list of specific, measurable outcomes, as they relate to the course & program objectives.

These learning outcomes should avoid using ambiguous language such as "understand" or "familiar".

Performance indicators must include an action verb (identifying the depth to which students should demonstrate performance), and the content referent that is the focus of the instruction (from ABET)

Target number 5 - 10

This course presents a survey of topics in signal processing. At the end of the semester, all students will be able to do the following:

1. Analyze a real-world signal data set and identify appropriate signal processing techniques to apply thereto.
2. Write a program or use a package to implement a signal processing algorithm.
3. Conduct signal processing experiments and properly report and discuss the results.
4. Effectively present a signal-processing article to an audience.
5. Review and critique signal processing articles.

Relationship Between Course Outcomes and Learning Outcomes

	ABET Learning Outcomes						
Specific Learning Outcomes		A	B	C	D	E	F
	1	●	●				●
	2	●	●	●			●
	3	●	●	●		●	
	4	●		●	●	●	
	5	●		●	●		●

Program Outcomes

(These are ABET-specified and should not be changed)

A. Graduates of the program will have an ability to: Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
B. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
C. Communicate effectively in a variety of professional contexts.
D. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
E. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
F. Apply computer science theory and software development fundamentals to produce computing-based solutions.

NOTE: In the construction of the student learning outcomes for this course, the instructors interpreted "computing requirements" in (B) as the functional requirements for a software solution and not as specific hardware requirements for the target platform; likewise, the phrase "[a]pply computer science theory" in (F) was interpreted as using computer science principles.

Major Topics Covered
(Approximate Course Hours)

3 credit hours = 37.5 contact hours
4 credit hours = 50 contact hours

Note: Exams count as a major topic covered

Signal formation (5-hours)
Signal representation (5-hours)
Signal transform (12.5-hours)
Signal filtering (12.5-hours)
Signal analysis (15-hours)

Assessment Plan for this Course

Each time this course is offered, the class is initially informed of the Course Outcomes listed in this document, and they are included in the syllabus. At the end of the semester, an anonymous survey is administered to the class where each student is asked to rate how well the outcome was achieved. The choices provided use a 5-point Likert scale containing the following options: Strongly agree, Agree, Neither agree or disagree, disagree, and strongly disagree. The results of the anonymous survey are tabulated and results are returned to the instructor of the course.

The course instructor takes the results of the survey, combined with sample student responses to homework and final exam questions corresponding to course outcomes, and reports these results to the ABET committee. If necessary, the instructor also writes a recommendation to the ABET committee for better achieving the course outcomes the next time the course is offered.

How Data is Used to Assess Program Outcomes

Each course Learning Outcome, listed above, directly supports one or more of the Program Outcomes, as is listed in "Relationships between Learning Outcomes and Program Outcomes". For CSCI 4840, Program Outcomes (a), (b), (c), (f) and (i) are supported.
Dr. Tianming Liu

Course Master Course History

Modified: 3/14/2024 by Dr. Tianming Liu.