

CSE 1221 (Approved): Introduction to Computer Programming in MATLAB for Engineers and Scientists

Course Description

Introduction to computer programming and problem solving techniques with applications in engineering and the physical sciences; algorithm development; programming lab experience.

Prior Course Number: CSE 205

Transcript Abbreviation: Prgrmg MATLAB

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Undergrad

Student Ranks: Freshman, Sophomore

Course Offerings: Autumn, Spring

Flex Scheduled Course: Never

Course Frequency: Every Year

Course Length: 14 Week

Credits: 2.0

Repeatable: No

Time Distribution: 1.0 hr Lec, 2.0 hr Lab

Expected out-of-class hours per week: 3.0

Graded Component: Lecture

Credit by Examination: Yes

Exam Types: Departmental Exams

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: Engr 1181 or Engr 1281 or Engr 181 or Engr 191 or ((Math 1151 or Math 1161 or Math 151 or Math 161) and (Phys 1250 or Phys 131))

Exclusions: Not open to students with credit for Engr 1221 or CSE 205

Cross-Listings: Engr 1221

The course is required for this unit's degrees, majors, and/or minors: No

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: 14.0901

Subsidy Level: Baccalaureate Course

General Information

MATLAB is taught.

Course Goals

Be competent with writing simple MATLAB programs performing numerical calculations
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Be competent with use of basic constructs provided by high-level imperative programming languages: sequencing, selection, and iteration

Be familiar with algorithmic thinking

Be familiar with use of computational approaches to solving problems in science and engineering

Be familiar with using basic data structures such as arrays

Be familiar with procedural composition
Be exposed to computational science concepts, including simulation, optimization, and data analysis

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Introduction to computation, concept of algorithm	2.0							
Variables, expressions and assignment	1.0		2.0					
Selection statements: if, switch	1.0		3.5					
Booleans, strings	1.0		2.0					
Matrices and indexing	1.0		3.5					
Loops: for and while; use of arrays	3.0		6.0					
Graphing, input/output with files, scripts	1.0		2.0					
Functions	1.0		3.5					
Higher order operators on matrices	1.0		3.5					
Review/exams	2.0							

Grades

Aspect	Percent
Homework	20%
Laboratory Assignments	30%
Two Midterm Examinations	25%
Final Examination	25%

Representative Textbooks and Other Course Materials

Title	Author
<i>Introduction to Scientific Computation and Programming</i>	Daniel T. Kaplan

ABET-EAC Criterion 3 Outcomes

Course Contribution	College Outcome
**	a An ability to apply knowledge of mathematics, science, and engineering.
*	b An ability to design and conduct experiments, as well as to analyze and interpret data.
***	c An ability to design a system, component, or process to meet desired needs.
	d An ability to function on multi-disciplinary teams.
***	e An ability to identify, formulate, and solve engineering problems.
	f An understanding of professional and ethical responsibility.
*	g An ability to communicate effectively.
	h The broad education necessary to understand the impact of engineering solutions in a global and societal context.
*	i A recognition of the need for, and an ability to engage in life-long learning.
	j A knowledge of contemporary issues.
***	k An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

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