هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title:	Applied Math for Computation
Course Code:	CS220
Program:	Computer Science
Department:	Computer Science
College:	Faculty of Computing and Information Technology
Institution:	Northern Border University
Version:	2
Last Revision Date:	January 31, 2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 3 /Year 2**)**					
4. Course general Description:					
This course is designed to provide students with a variety of disciplines who want to use computing to explore scientific problems. The focus will be on basic numerical methods for scientific and engineering problems, and MATLAB will be used as the primary environment for numerical computations. Topics include overview of MATLAB's syntax, code structure and algorithms, basic numerical methods for linear systems and eigenvalue problems.					
5. Pre-requirements for this course (if any)**:**					
6. Pre-requirements for this course (if any)**:**					
7. Course Main Objective(s):					
This course teaches students how to program a simple algorithm to use MATLAB as calculator and how to graph several functions using the tools of the program.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4	100%
2	E-learning		
3	Hybrid • Traditional classroom		

No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Recognize basic matrix mathematics in MATLAB	K1, K2	Class / Group discussion, Problem-based learning, Reciprocal teaching, Self-learning	Oral exams, Objective exams, Written exams (essay)
2.0	**Skills**			
2.1	Classify a stated impact of computing related to Applied Math and Scientific Computing as a local or global impact on individuals, organizations, and society.	S1	Lab-based learning Problem-solving Model-based learning	Objective Structured Practical Examination (OSPE), Oral exams, Problem-based Assessment
2.2	Implement nontraditional methods, such as fuzzy logic, rough sets,	S3	Lab-based learning Problem- Reciprocal teaching- Self-learning	Objective Structured Practical Examination (OSPE),

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	wavelets, and fractional calculus using MATLAB.			Oral exams, Problem-based Assessment
2.3	Use the MATLAB software to Draw the Graphs and get the Mathematical and Scientific Results Quickly	S3	Lab-based learning Problem- Reciprocal teaching- Self-learning	Objective Structured Practical Examination (OSPE), Oral exams, Problem-based Assessment
3.0	**Values, autonomy, and responsibility**			
3.1	Judge the course of action, given a scenario, which is in-line with their, ethical, legal, and social responsibilities.	V1	Collaborative learning Problem-based learning	Objective Structured Practical Examination (OSPE), Problem-based Assessment

C. Course Content

No	List of Topics	Contact Hours
1.	Get Familiar with MATLAB	7
2.	Use MATLAB as Calculator	8
3.	Graph several functions with MATLAB	7
4.	How to create vector rows, columns, and matrices	8
5.	Calculate sum, product, determinant, and inverse of matrices	7
6.	Connection between linear system and matrices system	11
7.	Resolve linear systems using MATLAB	12
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	2-15	5
2.	Assignments	2-15	10
3.	Participation	1-15	5

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
4.	Labs	1-16	20
5.	Midterm exam	6-12	20
6.	Final exam	17-18	40

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Xue, D., & Chen, Y. (2018). Scientific Computing with MATLAB® (3rd edition). Chapman and Hall/CRC..
Supportive References	1.Calter, P. A., Calter, P. A., Wraight, P., & White, S. (2016). Technical Mathematics with Calculus (6th edition). Wiley. 2.Sarhan M. Musa (2016). Fundamentals of Technical Mathematics, (1st edition). Academic Press.
Electronic Materials	1. Blackboard System: https://lms.nbu.edu.sa/ 2. Northern Border University Electronic Library: https://www.nbu.edu.sa/AR/Deanships/Library_Issues 3.Saudi Digital Library (SDL): https://portal.sdl.edu.sa/english/
Other Learning Materials	Nil

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom Laboratory
Technology equipment (projector, smart board, software)	Data Show (Projectors) in Classroom and Laboratory. Desktop computers OS: Windows 10 Software: NetBeans or Eclipse
Other equipment (depending on the nature of the specialty)	Nil

F. Assessment of Course Quality

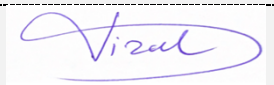
Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of Students assessment	Students	Indirect
Quality of learning resources	Students	Indirect
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**COMPUTER SCIENCES DEPARTMENT COUNCIL**
REFERENCE NO.	**25**
DATE	**13/05/2024**

Approved by	Dr. Nizal Alshammry
Position	Head of Department.
Signature	
Date	09/06/2024