هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Programming 1**
Course Code:	**CS 131**
Program:	**Computer Science/Information Technology**
Department:	**Computer Science**
College:	**College of Computer and Information Science**
Institution:	**Majmaah University**

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A. Course Identification

1. Credit hours: 4 (4,3,0)
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 3
4. Pre-requisites for this course (if any)**:**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	77	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	44
2	**Laboratory/Studio**	33
3	**Tutorial**	
4	**Others** (specify)	
	Total	77

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces the students to the fundamentals of programming concepts with their implementation in the C++ programming language. It introduces students to structured, top-down programming design and implementation. This course covers the following topics: problem solving techniques using algorithms and flowcharts, variables, data types, operators, conditional statements, loop structures, functions, arrays, pointers, strings.

2. Course Main Objective

The objectives of the course are: learn basic structured programming concepts, divide a problem into its logical components, gain knowledge of input/output statements, if-then-else statements, while and for loops, functions, gain knowledge of built-in data types, arrays and pointers to solve programming problems, and construct error-free C++ programs.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO1- Identify the basic components of a computer system.	K1
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO2- Design an algorithm to solve a given problem using the top-down design approach	S1
2.2	CLO3- Understand the concept of using functions to increase modularity and reusability	S1
2.3	CLO4- Understand and use the three basic programming structures: sequence, selection, repetition.	S1
2...	CLO5- Use arrays, strings and pointers to manipulate data	
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	**Introduction to Computers**	**7**
2	**Problem solving techniques**	**7**
3	**Variables , Data types, Operators**	**7**
4	**Conditional statements**	7
5	**Repetition statements**	7
6	**Functions, call by value, Call by reference**	7
7	**Arrays, types of arrays**	7
8	**Arrays to functions**	7
9	**Pointers**	7
10	**Strings**	**7**
11	**C++ programming examples**	**7**
Total		77

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	CLO1- Identify the basic components of a computer system.	Classroom	Quiz, Mid Exam, Lab, Homework, Final Exam
1.2			
1.3			

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.0	**Skills**		
2.1	CLO2- Design an algorithm to solve a given problem using the top-down design approach	Classroom + Lab based Teaching	Quiz, Mid Exam, Lab, Homework, Final Exam
2.2	CLO3- Understand the concept of using functions to increase modularity and reusability	Classroom + Lab based Teaching	Quiz, Mid Exam, Lab, Homework, Final Exam
2.3	CLO4- Understand and use the three basic programming structures: sequence, selection, repetition.	Classroom + Lab based Teaching	Quiz, Mid Exam, Lab, Homework, Final Exam
2.4	CLO5- Use arrays, strings and pointers to manipulate data	Classroom + Lab based Teaching	Quiz, Mid Exam, Lab, Homework, Final Exam
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	Week 3	5 %
2	Midterm Exam	Week 6	20 %
3	Quiz 2	Week 7	5 %
4	Lab Exam	Week 11	20 %
5	Programming Assignments	Week 11	10 %
6	Final Exam	Week 12	40 %
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Every faculty will be assigned a number of students in the corresponding department for academic advising. Students can meet the faculty during advising hours or whenever the faculty is in the office during the specified office hours.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Dietel & Dietel, "C++: How To Program", Prentice Hall, 10th edition (2017).
Essential References Materials	• The C++ Programming Language: Special Edition, Bjarne Stroustrup, Addison-Wesley Professional, 2013. • C++ Programming: From Problem Analysis to Program Design, De D. S. Malik, Cengage Learning, 2012.

	• C++ Programming for the Absolute Beginner, De Dirk Henkemans and Mark Lee, Course Technology, 2009.
Electronic Materials	www.dietel.com
Other Learning Materials	**Dev C++ IDE or Visual C++ Software**

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	PC with Windows/Linux, LCD Projector, Smart Board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	C++ compiler

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Test/Quiz/Mid Term/ Final Exam assessment (Extent of achievement of course learning outcomes)	Instructure	Direct
Course Survey in the middle of the semester and at the end of the semester (Effectiveness of teaching and assessment)	Students	Indirect
Final Exam Answer Scripts Verification	Peer faculty members	Review (Direct)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Programming II
Course Code:	**CS211**
Program:	**Computer Science**
Department:	**Computer Science**
College:	**Computer and Information Sciences**
Institution:	**Majmaah University**

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D. Teaching and Assessment **4**

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E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: 4(3,2,0)
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 4
4. Pre-requisites for this course (if any)**:** **CS131 – Programming I**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	55	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	22
3	**Tutorial**	
4	**Others** (specify)	
	Total	55

B. Course Objectives and Learning Outcomes

1. Course Description

This course is an introductory course in object-oriented programming. The fundamental concepts of object-oriented programming will be studied using the C++ programming language.

2. Course Main Objective

The students are expected to be able to:

(a) Understand the basic OO programming concepts.
(b) Compare the OO programming approach against the traditional approach.
(c) Identify the main objects/classes, methods, attributes from given problem specifications.

(d) Design and code small to medium sized problems from the start using the appropriate OO concepts and other concepts introduced (class, inheritance, polymorphism, generic programming etc.)
(e) Create and manipulate Files using the available I/O file streams classes.
(f) Contribute to a group effort to realize an OOP based solution

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	Students will apply formulas and functions of mathematics.	S1
2.2	Students will analyze a programming problem in object-oriented domain and find computing requirements which will map to the given problem and its solution.	S1
2.3	Students will be able to analyze, design and implement a program using object-oriented programming tool and C++ programming language.	S2
2...		
3	**Values:**	
3.1	Students will perform programming and lab related activities in group	V1
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Overview of C++ basic concepts	5
2	Functions and an Introduction to Recursion	5
3	Arrays and Vectors	5
4	Pointers	5
5	Classes and Objects	10
6	Inheritance, Polymorphism, and Operator Overloading	10
7	Templates	5
8	File Processing	5
9	Review	5
Total		55

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2			
…			
2.0	**Skills**		
2.1	Students will apply formulas and functions of mathematics.	Classroom Teaching	Midterm Exam, Final Exam
2.2	Students will analyze a programming problem in object-oriented domain and find computing requirements which will map to the given problem and its solution.	Classroom Teaching	Midterm Exam, Final Exam
2.3	Students will be able to analyze, design and implement a program using object-oriented programming tool and C++ programming language.	Mini Project, Lab Exercises	Lab Based Assignments, Mini Project
3.0	**Values**		
3.1	Students will perform programming and lab related activities in group	Mini Project, Lab Exercises	Lab Project Evaluation
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Exam 1	5	15%
2	Exam 2	8	15%
3	Lab Assignments	11	15%
4	Project	11	15%
5	Final Exam	12	40%
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Two office hours per week are dedicated to students.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	C++ How to Program H. M. Deitel, P.J.Deitel, Prentice Hall, 2016, 10th ed.
Essential References Materials	

Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom, lab, PCs
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, MS Visual Studio
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of assessment	Instructor	Direct
Achievement of CLOs	Instructor	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Data Structures**
Course Code:	**CS231**
Program:	**Computer Science**
Department:	**Computer Science**
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

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E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours:	3 (3+0+1)
2. Course type	
a.	University ☐ College ☑ Department ☐ Others ☐
b.	Required ☑ Elective ☐
3. Level/year at which this course is offered:	**Level-6 / 2**
4. Pre-requisites for this course (if any)**:**	**CS 211**
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

The purpose of this course is to provide the students with solid foundations in the basic concepts of programming data structures and algorithms. The main objective of the course is to teach the students how to select and design data structures and algorithms that are appropriate for problems that they might encounter. This course is also about comparing algorithms and studying their correctness and computational complexity. This course offers the students a mixture of theoretical knowledge and practical experience using C++.

2. Course Main Objective

The main objective of the course is to teach the students how to select and design data structures and algorithms that are appropriate for problems that they might encounter. This course is also about comparing algorithms and studying their correctness and computational complexity. This course offers the students a mixture of theoretical knowledge and practical experience using C++.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Understanding the variety of data structures such as stack, queue, hash tables, trees and graph	K1
1.2		
1.3		
1...		
2	**Skills :**	
2.1	Able to implement the insert, delete, and search operations on all the structures presented such as the efficiency trade-offs of using arrays, hash tables, linked lists, and trees.	S1
2.2	Implement and evaluate some of data structure such as stack, queue and graph structure is required to solve a problem.	S2
2.3		
2...		
3	**Values:**	
3.1	Students learn how to solve problems using algorithms and data structures. They work as team in mini project and do exam individually	V1
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Data Design and Implementation (algorithm analysis, growth of functions, ADTs)	4
2	Unsorted lists (Array-based, Linked Lists)	4
3	Stacks (Array-based, Linked Lists)	6
4	Queues (Array-based, Linked Lists)	6
5	Programming with Recursion, Binary Search Trees	4
6	Hashing	6
7	Graphs (DFS, BFS)	6
8	Sorting (selection, bubble)	4
9	Searching,	4
10		
11		
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
…			
2.0	**Skills**		
2.1	Able to implement the insert, delete, and search operations on all the structures presented such as the efficiency trade-offs of using arrays, hash tables, linked lists, and trees.	Classroom Teaching	Class Test, Mid Exam, Final Exam
2.2	Implement, and evaluate some of data structure such as stack, queue and graph structure is required to solve a problem.	Mini Project, Lab Exercises	Lab Based Assignments, Mini Project
…			
3.0	**Values**		
3.1	Students learn how to solve problems using algorithms and data structures. They works as team in mini project and do exam individually	Classroom Teaching, Mini Project	Class Test, Mid Exam, Final Exam
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 4 and 8	5%
2	Assignments	Week 3, 7 and 9	15%
3	Mid Term	Week 7	25%
4	Project	Every Week	15%
5	Final Exam	Week 12	40%
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counselling.
- Available for a minimum of 4 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / D2L/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	**Nell Dale, "C++ Plus Data Structures", Jones & Bartlet Learning; 5th ed. (2011). ISBN-10: 1449646751, ISBN-13: 978-1449646752.**	
Essential References Materials		
Electronic Materials		
Other Learning Materials	**Dev C++/Visual studio C++**	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Class Room, PC laboratory**
Technology Resources (AV, data show, Smart Board, software, etc.)	**LCD Projector, Dev C++/Visual studio C++**
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Feedback	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	CS Council
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Computer Graphics
Course Code:	**CS 233**
Program:	**BS CS**
Department:	Computer Science
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

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D. Teaching and Assessment **5**

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2. Assessment Tasks for Students 6

E. Student Academic Counseling and Support **6**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 7

G. Course Quality Evaluation **7**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours:	3 Credits (3 Lecture,0 Lab,1 Tutorial))
2. Course type	
a.	University ☐ College ☐ Department ☑ Others ☐
b.	Required ☐ Elective ☐
3. Level/year at which this course is offered:	**Level 6**
4. Pre-requisites for this course (if any)**:**	**CS 120**
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	%100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This Course is designed to develop knowledge and understanding of the Computer Graphics. There is virtually no area in which graphical displays cannot be used to some advantage, and so it is not surprising to find the use of computer graphics so widespread. Although early applications in engineering and science had to rely on expensive and cumbersome equipment, advances in computer technology have made interactive computer graphics a practical tool. Today, we find computer graphics used routinely in such diverse areas as science, engineering, medicine, business, industry, government, art, entertainment, advertising, education, and training.

2. Course Main Objective

The aim of this course is to allow students to acquire knowledge of understanding Computer Graphics Systems, specifically;

- The fundamental display algorithms for raster graphics systems
- The mathematical nature of 2- and 3-D environments
- The properties of surfaces and their simulation

. Briefly describe any plans for developing and improving the course that are being implemented:

- Update the content periodically.
- Using Latest references.
- Using web references.
- Using new visual tools in teaching.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO1 Understand and practice the concept of cryptographic algorithms	K1
1.2	CLO2: Learn the current state of the art techniques that are employed for defeating secure systems	K1
1.3	CLO4: Understand Digital signatures in practice with legal/regulatory aspects	K1
1.4	CLO5: Understand attacks in payment systems, bitcoin and crypto currencies	K1
2	**Skills :**	
2.1	CLO3: Analyze hashing functions, message authentication codes and key establishment	C2
3	**Values:**	
3.1		
3.2		

C. Course Content

No	List of Topics	Contact Hours
1	Graphics Models	3
2	Graphics Programming	5
3	Input and Interaction	4
4	Geometric Objects	3
5	Geometric Transformations	6
6	Viewing	4
7	Shading	3
8	From Vertices to Fragments	4
9	Discrete Techniques	2
10	Programmable Shaders	2

11	Modeling	2
12	Curves & Surfaces	2
13	Advanced Rendering	2
14	Revision	2
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Understand the foundations of computer graphics: hardware systems, math basis, light and colour.	Lecture	Direct-Quiz, Mid Term Exam, Final Exam,
1.2	Understand Graphics Models & Geometric Objects	Lecture	Direct-Quiz, Mid Term
1.3	Understand Geometric Transformations	Lecture	Exam, Final Exam
1.4	Understand the concept of Viewing, Shading	Lecture	Direct-Quiz, Mid Term, Project
1.5	Understand & describe Curves & Surfaces and Advanced Rendering Acquainted with some advanced topics in computer graphics; these might include texturing, animation, physically-based modeling, procedural modeling, curves and surfaces, global illumination, interaction, visualization, and virtual reality.	Lecture	Direct-Quiz, Mid Term, Project
2.0	**Skills**		
2.1	Implement Line drawing, Circle drawing, Clipping algorithms, Geometric Transformations, key components of the rendering, especially visibility, characterization, viewing, and shading. Understand the issues involved in implementing other components.	Lecture	Assignments, CLO Survey
3.0	**Values**		
3.1			
3.2			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Test 1	Week 4,	10%
2	Mid Term	Week 8	20%
3	Test 2	Week 9,	10%
4	Final Exam	Week 11	40%
5	Attendance	Week 11	5%
6	Project	Week 11	15%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Every faculty will be assigned 10 students in the corresponding department for academic advising. Students can meet the faculty during advising hours or whenever the faculty is in the office.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Computer Graphics with OpenGL, D. Hearn and M. Baker, 3rd ed., Prentice Hall, 2003.
Essential References Materials	• Real-Time Rendering, Akenine-Moller, Haines, 2nd edition, AK Peters Ltd, 2002. • Fundamentals of Computer Graphics, Shirley, Ashikhmin, Gleicher, Marschner, Reinhard, Sung, Thompson, and Willemsen, A K Peters, 2005. • Computer Graphics: Princiles and Practice, Foley, Addison-Wesley, 2000. • Computer Graphics: Using OpenGL, Hill, 2nd edition, Prentice Hall, 2001.
Electronic Materials	• http://ocw.mit.edu/courses/electrical-engineering-and-computer-science / • http://courses.cs.vt.edu/csonline/CG • http://www.cs.iit.edu/~cs561/cs351/CG
Other Learning Materials	Nil

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	LCD Projector,
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Test-1, Test-2Final Examination, Mid term exam, and Practical exam	Faculty	Direct
Survey	Students	Indirect

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Operating System
Course Code:	CS 311
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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A. Course Identification **3**

6. Mode of Instruction (mark all that apply) 3

B. Course Objectives and Learning Outcomes **3**

1. Course Description ..... **Error! Bookmark not defined.**

2. Course Main Objective ..... **Error! Bookmark not defined.**

3. Course Learning Outcomes 3

C. Course Content **4**

D. Teaching and Assessment **6**

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F. Learning Resources and Facilities **7**

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G. Course Quality Evaluation **8**

H. Specification Approval Data **8**

A. Course Identification

1. Credit hours: 3(3,0,1)
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 7
4. Pre-requisites for this course (if any)**: Data Structure (CS 231)**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	**55**	**100%**
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	**44**
2	**Laboratory/Studio**	
3	**Tutorial**	**11**
4	**Others** (specify)	
	Total	

B. Course Objectives and Learning Outcomes

1. Course Description

This course is an introduction to the theory and practice behind modern computer operating systems. This course aims to provide a theoretical as well as experimental background of operating system. Topics include OS Component, OS structure, System calls and interfaces, Process management, Resource scheduling and management (of the CPU, memory, etc.), Synchronization of concurrent processes, Deadlocks, Memory management, Virtual memory, File System Structure & implementation, Mass-storage structure and I/O Systems.

2. Course Main Objective

Aim of the course is to understand general structure of an operating system and its functions, key concepts such as multiprogramming, understand the role of operating systems in management of computer resources such as processes, memory, CPU, files,

disks, input output subsystems and apply important methods and algorithms for scheduling the different activities during the operation of a computer.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO 1- Identify and Discuss the issues and problems involved in the design of operating systems.	K1
1.2	CLO 2- Identify issues of process Management including Process Structure, Scheduling, Synchronization and Deadlock.	K1
1.3	CLO 5. Identify and Discuss the issues related to File System Structure, Mass-Storage Structure, I/O Systems I/O Sub-systems	K1
2	**Skills :**	
2.1	CLO 3. Demonstrate scheduling algorithms, synchronization techniques and Deadlock recovery and avoidance algorithms.	S2
2.2	CLO4. Demonstrate memory management issues including advance techniques of paging, segmentation and virtual memory.	S2
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction & OS-Structures • Introduction • Different OSs (Mainframe, Desktop, Multiprocessor, Distributed, Clustered, Real-Time, Handheld). • Computer-System Structures (I/O, Storage, Storage Hierarchy, Hardware Protection, Network). • OS-Structures (Components, Services, System Calls, System structure, Virtual Machines, System Design & Implementation).	6
2	Process Management • Processes • Process Concept • Process Scheduling • Operations on Processes • Cooperating Processes • Inter-process Communication • Communication in Client-Server	4

3	Threads • Threads • Multithreading models • Threading Issues • Pthreads, Solaris 2 threads, Windows 2000 threads, Linux Threads, Java Threads	4
4	Scheduling • CPU Scheduling • Scheduling Criteria • Scheduling Algorithms, • Algorithm Evaluation • Process Scheduling Models	4
5	Process Synchronization • Process Synchronization • Critical-Section Problem • Synchronization Hardware • Semaphores • Critical Regions • Monitors • Classical Problems	6
6	Deadlocks • Deadlocks • Deadlock Characterization • Methods for Handling Deadlocks (Prevention, Avoidance, Detection) • Recovery from Deadlock	4
7	Memory Management • Address Binding Concept • Swapping • Contiguous Memory Allocation • Paging • Segmentation • Segmentation with Paging Virtual Memory • Demand Paging • Page Replacement • Allocation of frames • Thrashing	7
8	Storage Management • File-System Interface • File Concept	4

	• Access Methods • Directory Structure • File-System Mounting • File Sharing • Protection	
9	File-System Implementation • File-System Structure • File-System Implementation • Directory Implementation • Allocation Methods • Free-Space management • Efficiency and Performance • Recovery	4
.10	I/O Systems • I/O Hardware • Application I/O Interface • Kernel I/O Subsystem • Transforming I/O to Hardware Operations • Streams • Performance	4
11	Mass-Storage Structure • Disk Structure • Disk Scheduling • Disk Management • Swap-Space Management • RAID Structure	4
	Review	4
Total		**55**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	CLO 1- Identify and Discuss the issues and problems involved in the design of operating systems.	Classroom Teaching	Test, Mid Exam, Final Exam, Assignments
1.2	CLO 2- Identify issues of process Management including Process Structure, Scheduling, Synchronization and Deadlock.	Classroom Teaching	Test, Mid Exam, Final Exam, Assignments

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.3	CLO 5. Identify and Discuss the issues related to File System Structure, Mass-Storage Structure, I/O Systems I/O Sub-systems	Classroom Teaching	Test, Mid Exam, Final Exam, Assignments
2.0	**Skills**		
2.1	CLO 3. Demonstrate scheduling algorithms, synchronization techniques and Deadlock recovery and avoidance algorithms.	Exercise/ Teaching in Lab	Lab Based Assignments, Lab Test, Mid Exam, Final Exam
2.2	CLO4. Demonstrate memory management issues including advance techniques of paging, segmentation and virtual memory.	Exercise/ Teaching in Lab	Lab Based Assignments, Lab Test, Mid Exam, Final Exam
…			
3.0	**Values**		
3.1			
3.2			
3.3			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	Week 3	10%
2	Assignment 1	Week 3	10%
3	Midterm	Week 6	20%
4	Assignment 2	Week 7	10%
5	Quiz 2	Week 9	10%
6	Final Exam	Week 11	40%
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
Each student is allotted to an academic advisor for guidance and counselling

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• **Operating System Concepts, Silberschatz, Galvin, and Gagne, 10th edition, Wiley, 2018.**
Essential References Materials	• **Charles Crowley, "Operating Systems: A Design Oriented Approach", Tata McGraw Hill 1999.** • **Modern Operating Systems, Tanenbaum, 3rd edition, Prentice Hall, 2007.**

	• **Operating Systems: Design and Implementation, Tanenbaum and Woodhull, Prentice**
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Test/Quiz/Mid Term/ Final Exam assessment (Extent of achievement of course learning outcomes)	Course instructor	Direct
Course Survey in the middle of the semester and at the end of the semester (Effectiveness of teaching and assessment)	Students	Indirect
Extent of achievement of course learning outcomes	Students	Indirect
Final Exam Answer Scripts Verification	Peer faculty members	Review (Direct)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	CS Council
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Software Engineering
Course Code:	**CS 312**
Program:	**Computer Science**
Department:	**Computer Science**
College:	**College of Computer and Information Science**
Institution:	**Majmaah University**

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A. Course Identification **3**

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E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 5

2. Facilities Required 5

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: (3+0+1)	
2. Course type	
a. University ☐ College ☐ Department ☒ Others ☐	
b. Required ☒ Elective ☐	
3. Level/year at which this course is offered: Level 7	
4. Pre-requisites for this course (if any)**:** N/A	
5. Co-requisites for this course (if any)**:** N/A	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	40
2	**Laboratory/Studio**	10
3	**Tutorial**	5
4	**Others** (specify)	
	Total	

B. Course Objectives and Learning Outcomes

1. Course Description

This is a reading and discussion subject on issues in the engineering of software systems and software development project design. It includes the present state of software engineering, what has been tried in the past. Topics may differ in each offering but will be chosen from: the software process and lifecycle; requirements and specifications; design principles; formal analysis, and reviews; quality management and assessment; product and process metrics; COTS and reuse; evolution and maintenance; team organization and people management; and software engineering aspects of programming languages.

2. Course Main Objective

1 Understand the activities that are involved in the software development
2 Discuss various software process models
3 Explain the concepts of architectural design and detailed design
4 Understand the notation of Unified Modeling Language for modeling requirements
5 Describe the process of various testing techniques

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Understand the activities that are involved in the software development	K1
1.2	Discuss various software process models	K1, S1
1.3	Explain the concepts of architectural design and detailed design	S2
1...		
2	**Skills :**	
2.1	Understand the notation of modelling using Unified Modelling Language	S2, S3, S4, V1
2.2	Describe the process of various testing techniques.	K1, S2
2.3	Understand the process of software project management	V1, V2
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Software Engineering	6
2	Requirements Engineering	10
3	Software and project metrics	6
4	Software processes	6
5	Software project management	7
6	Software quality assurance	10
7	Unified Modeling Language (UML)	10
Total		55

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Understand the activities that are involved in the software development		Quiz, Mid and Final Exams
1.2	Discuss various software process models		Quiz, Mid and Final Exams
1.3	Explain the concepts of architectural design and detailed design		Quiz, Mid and Final Exams, Project
2.0	**Skills**		
2.1	Understand the notation of modelling using Unified Modelling Language		Exercises, Group Project, Mid
2.2	Describe the process of various testing techniques.		Quiz, Mid and Final Exams

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.3	Understand the process of software project management		Quiz, Mid and Final Exams
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm Exam	8	20
2	Project	9	15
3	Homework and Assignments	5, 9	10
4	Quiz	4,8	10
5	Participation	1-9	5
6	Final Exam	11	40
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Ian Sommerville, "Software Engineering", Addison Wesley; 9th ed. (March 2010). ISBN-10: 0137035152, ISBN-13: 978-0137035151
Essential References Materials	ITimothy Lethbridge, Robert laganiere, "Object-Oriented Software Engineering: Practical Software Development using UML and Java", Mc Graw Hill;2nd ed. (December 2004). ISBN-10: 0077109082, ISBN-13: 978-0077109080
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation	Classroom, Computer Lab

Item	Resources
(Classrooms, laboratories, demonstration rooms/labs, etc.)	
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, UML design software (Visual Paradigm)
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Attainment of CLO	Instructor, TA	Performance in the exam for a particular CLO(s)
Quality of learning resources	Convener , instructors, HOD	Regular follow ups

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Computer Organization**
Course Code:	**CS 322**
Program:	**Computer Science/Information Technology**
Department:	**Computer Science**
College:	**College of Computer and Information Science**
Institution:	**Majmaah University**

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E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: 3(3,0,1)
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 8
4. Pre-requisites for this course (if any)**: MH 121**
5. Co-requisites for this course (if any)**: N.A.**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces students with the fundamentals of computer organizations and architectures. Topics included are: Organization and Architecture, Computer Components, Computer Function, Interconnection Structures, Bus Interconnection, Binary Numbers, The Decimal System. The Binary System, Converting between Binary and Decimal, Hexadecimal Notation, Binary Multiplication, Floating Point Numbers Boolean functions and logic gate, Design of combinational Circuits Instruction Set Architecture, Assemblers, Assembly Language Programming, External Memory, Cache Memory, Paging & Segmentation, Design of Data Path, Design of Control Unit, Instruction Execution Characteristics, Reduced Instruction Set Architecture, The RISC versus CISC Controversy.

2. Course Main Objective

The course aims to enables the students to learn the internal working of a computer. The students study the basics of memory organization, number systems and their conversions, design of logic circuits and functioning of CPU.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Identify the basic components and interconnections of computer system.	K1
1.2	Understand the details of numbering systems conversion and representation.	K1
1.3		
1.4		
2	**Skills :**	
2.1	Design logic circuits by applying the concepts of Boolean Algebra and K-Maps	S1
2.2	Apply assembly language programming to solve problems.	S1
2.3	Describe the impact of memory caching and hierarchy options on the design of computer systems.	S1
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Computer Components, Computer Function, Interconnection Structures, Bus Interconnection	4
2	Numbering systems, converting between Binary and Decimal, Hexadecimal systems	4
3	Computer Arithmetic (addition, subtraction and multiplication)	4
4	Boolean Function simplification	4
5	Karnaugh maps and Logic Gates	4
6	Design of combinational Circuits	4
7	MARIE Instruction Set Architecture	4
8	Assembly Language Programming	4
9	Cache memory organization	4
10	Virtual memory organization	4
11	Reduced Instruction Set Architecture	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Identify the basic components and interconnections of computer system.	Classroom Lectures, Group Discussions, Lab demonstrations, Home assignments, Tutorial classes	Written Tests, Quizzes, Homework, Final Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2	Understand the details of numbering systems conversion and representation.	Classroom Lectures, Group Discussions, Home assignments, Tutorial classes	Written Tests, Quizzes, Homework, Final Exam
1.3			
1.4			
2.0	**Skills**		
2.1	Design logic circuits by applying the concepts of Boolean Algebra and K-Maps	Classroom Lectures, Group Discussions, Lab demonstrations, Home assignments, Tutorial classes	Written Tests, Quizzes, Homework, Final Exam, lab assignments, mini-project
2.2	Apply assembly language programming to solve problems.	Classroom Lectures, Group Discussions, Lab demonstrations, Home assignments, Tutorial classes	Written Tests, Quizzes, Homework, Final Exam
2.3	Describe the impact of memory caching and hierarchy options on the design of computer systems.	Classroom Lectures, Group Discussions, Home assignments, Tutorial classes	Written Tests, Quizzes, Homework, Final Exam
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Home Assignments/class discussions	Week 13	10%
2	Class Test 1	Week 4	10%
3	Mid-Exam	Week 8	20%
4	Class Test2	Week 12	10%
5	Lab assignments/mini project	Week 14	10%
6	Final Exam	Week 16	40%
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
Every faculty will be assigned a number of students in the corresponding department for academic advising. Students can meet the faculty during advising hours or whenever the faculty is in the office during the specified office hours.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	1. The Essentials of Computer Organization and Architecture, Linda Null and Julia Lobor, Jones and Bartlett 2018. ISBN-13: 978-1284123036

Essential References Materials	2. Computer Organization and Architecture: Designing for performance by William Stallings, Pearson, Global Edition, 2016, ISBN-13: 978-9332570405 3. Logic & Computer Design Fundamentals (5th Edition) by by M. Morris R. Mano , Charles R. Kime, Tom Martin, Pearson, 2015. ISBN-13: 978-0133760637
Electronic Materials	https://marie.js.org/
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom, laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, smart board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Digital training board

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Test/Quiz/Mid Term/ Final Exam assessment (Extent of achievement of course learning outcomes)	Instructure	Direct
Course Survey in the middle of the semester and at the end of the semester (Effectiveness of teaching and assessment)	Students	Indirect
Final Exam Answer Scripts Verification	Peer faculty members	Review (Direct)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Programming Languages
Course Code:	CS 323
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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E. Student Academic Counseling and Support **6**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **7**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours:	**3(3,0,1)**
2. Course type	
a.	University ☐ College ☐ Department ☐ Others ☒
b.	Required ☒ Elective ☐
3. Level/year at which this course is offered:	**Level 8/Year 3**
4. Pre-requisites for this course (if any)**:**	**CS 211**
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course gives students a set of formal mathematical tools for defining and implementing the semantics of a language and demonstrates them in the context of important real-world programming languages, with emphasis on theoretical properties of type systems.

2. Course Main Objective

To acquire the fundamental concepts of programming languages and techniques to discuss and compare features of several popular programming paradigms such as imperative, object oriented, functional, and logic programming. Understand how to examine modern programming languages and features: abstract data and control structures, procedures, parameter passing mechanisms, block structuring and scope rules, input/output, and storage management.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO3- Demonstrate facility of BNF specifying programming language syntax and semantics	K1
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO1- Describe the evolution of modern programming languages.	S1
2.2	CLO2- Identify the basic aspects of various programming paradigms.	S1
2.3	CLO4- Show understanding of issues involving variables and subprograms	S1
2.4	CLO5- Describe features of functional and logic programming languages	S1
2.5		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction • Reasons for studying concepts of programming languages • Language evaluation criteria • Language Categories	3
2	Describing Syntax and Semantics • The general problem of describing syntax • Formal methods of describing syntax • Attribute grammars	4
3	Lexical and Syntax Analysis • Lexical analysis • The parsing problem • Recursive Descent parsing	3
4	Name, Bindings, Type Checking, and Scopes • Names • Variables • The concepts of binding	3
5	Data Types • Primitive data types • Different structures • Character string types • User defined ordinal types	4

6	• Arrays types • Record types • Union types • Pointer and reference type	4
7	Expressions and Assignment Statements • Arithmetic expressions • Overloaded operators • Types conversions	4
8	• Relational and Boolean expressions • Short circuit evaluation • Assignment statements • Mixed mode assignment	4
9	Statement Level control structures	4
10	Subprograms • Design issues for subprograms • Local referencing environments Parameter passing methods • Parameters that are subprogram names	4
11	Functional programming languages	4
12	Logic programming languages	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	CLO3- Demonstrate facility of BNF specifying programming language syntax and semantics.	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
1.2			
…			
2.0	**Skills**		
2.1	CLO1- Describe the evolution of modern programming languages.	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
2.2	CLO2- Identify the basic aspects of various programming paradigms.	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
2.3	CLO4- Show understanding of issues involving variables and subprograms	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
2.4	CLO5- Describe features of functional and logic programming languages	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
2.5			
3.0	**Values**		
3.1			
3.2			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 3, Week 8	10%
2	Assignments	Week 4, Week 9	20%
3	Mid Term Exam	Week 6	20%
4	Homework	Week 10	5%
5	Exercise	Every Week	5%
6	Final Exam	Week 12	40%
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
Each student is allotted to an academic advisor for guidance and counseling

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Concepts of Programming Languages, Robert W. Sebesta, Prentice Hall, 2007, 8th Edition
Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Classroom**
Technology Resources (AV, data show, Smart Board, software, etc.)	**PC with Windows/Linux, LCD Projector, Smart Board**
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	**Internet Connection**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Examination, Midterm Exam & Quizzes	Instructor	Direct
Survey	Students	Indirect
Final Examination Marks	Peers	Verification of Marks
Course Report	Quality Unit	Checklist quality reports

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	College Council
Reference No.	Meeting #1
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Algorithm Design and Analysis**
Course Code:	**CS 334**
Program:	**Computer Science**
Department:	**Computer Science**
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

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A. Course Identification **3**

6. Mode of Instruction (mark all that apply) 3

B. Course Objectives and Learning Outcomes **3**

1. Course Description 3

2. Course Main Objective 3

3. Course Learning Outcomes 4

C. Course Content **4**

D. Teaching and Assessment **4**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 4

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: 3 (3,0,1)
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 9
4. Pre-requisites for this course (if any)**: CS 231**
5. Co-requisites for this course (if any)**: N.A.**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces the several fundamental principles of algorithm design and analysis. This course gives a broad look on Asymptotic notations, divide-and-conquer design approaches, fast sorting, searching techniques using algorithms and multiplication. Graphs, shortest paths are also introduced here.

2. Course Main Objective

The course aims to enables the students to asymptotic notations, divide-and-conquer design approaches, fast sorting and searching algorithms. The students study the fundamental algorithms on graphs, such as how to find shortest paths, and how to explore graphs.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO1- Students will understand fundamental computer algorithms and will learn how to analyze them using basic techniques	K1
1.2	CLO2- Students will understand, compare and analyze the primary sorting and searching algorithms	K1
1.3	CLO4- Students will understand, compare and analyze the graph processing algorithms	K1
2	**Skills :**	
2.1	CLO3-Students will recognize problems where dynamic programming is an appropriate solution method and will be able to apply it	S1
2.2	CLO5- Students will **a**pply the algorithmic complexity principles in the design of programs	S2
3	**Values:**	
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Algorithms	4
2	Asymptotic Analysis	4
3	Divide & Conquer Algorithms (Mergesort, Quicksort, Heapsort, Recurrences, Master Theorem)	8
4	Linear Time Algorithms	8
5	Data Structures (BST, Red-Black Trees)	4
6	Dynamic Programming & Greedy Algorithms	6
7	Graph Algorithms (Graph implementation, BFS, DFS, MST, Dijkstra's Algorithm, Prim's Algorithm)	8
8	NP-Completeness	2
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	CLO1- Students will understand fundamental computer algorithms and will learn how to analyze them using basic techniques	Classroom Lectures Group Discussions Tutorial Classes	Homework Assignments Quizzes, Mid exam Final Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2	CLO2- Students will understand, compare and analyze the primary sorting and searching algorithms	Classroom Lectures Group Discussions Tutorial Classes	Homework Assignments Quizzes, Mid exam Final Exam
1.3	CLO4- Students will understand, compare and analyze the graph processing algorithms	Classroom Lectures Tutorial Classes	Assignment Final Exam
2.0	**Skills**		
2.1	CLO3-Students will recognize problems where dynamic programming is an appropriate solution method and will be able to apply it	Classroom Lectures Group Discussions Lab demonstrations Tutorial Classes	Assignments Lab Exercise
2.2	CLO5- Students will **a**pply the algorithmic complexity principles in the design of programs	Classroom Lectures Group Discussions Lab demonstrations Tutorial Classes	Homework Assignments Final Exam
3.0	**Values**		
3.1			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Home Assignments	Week 13	10%
2	Class Test 1	Week 4	10%
3	Mid-Exam	Week 8	20%
4	Class Test2	Week 12	10%
5	Lab assignments/mini project	Week 14	10%
6	Final Exam	Week 16	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

Every faculty will be assigned a number of students in the corresponding department foracademic advising. Students can meet the faculty during advising hours or whenever the faculty is in the office during the specified office hours.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Introduction to Algorithms, Cormen, Leiserson, Rivest, And Stein, 3rd Edition, Mit Press, 2009
Essential References Materials	• Introduction to The Design and Analysis of Algorithms. Ananylevitin, Pearson Education, 3rd Edition,2011. • Introduction to Design & Analysis of Algorithms, Anany Levitin, Addison Wesley, 2011. • Foundations of Algorithms (4e). Richard E. Neapolitan And Kumarssnaimipour,." Jones And Bartlett, 4th Edition, 2009.
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom and Laboratories, as those that are available at the college of Computer and Information Science.
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, Smart board, Internet Access
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam assessment	Peers	Verification of Marks
Course Report Verification	Quality Coordinator	Check List

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Compilers
Course Code:	CS412
Program:	Computer Science
Department:	Computer Science
College:	Computer and Information Sciences
Institution:	Majmaah University

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A. Course Identification 3

6. Mode of Instruction (mark all that apply) 3

B. Course Objectives and Learning Outcomes 3

1. Course Description 3

2. Course Main Objective 3

3. Course Learning Outcomes 4

C. Course Content 4

D. Teaching and Assessment 4

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 4

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support 5

F. Learning Resources and Facilities 5

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation 6

H. Specification Approval Data 6

A. Course Identification

1. Credit hours:	**3 (3,1,0)**
2. Course type	
a.	University ☐ College ☒ Department ☐ Others ☐
b.	Required ☒ Elective ☐
3. Level/year at which this course is offered:	Level 10
4. Pre-requisites for this course (if any)**:**	CS270 – Programming Languages
5. Co-requisites for this course (if any)**: NIL**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	11
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

In this course students will develop a deeper understanding of modern compiler techniques applied to general purpose programming languages. It will give students a working knowledge of the foundations, tools, and engineering approaches used in developing formal language translators.

2. Course Main Objective

The student is expected to be able to:

(a) Understand the principles of compilers construction
(b) Understand the basic components of a compiler (e.g. lexical analysis, top-down, bottom-up parsing, context-sensitive analysis, and intermediate code generation)
(c) Design and implement a simple compiler
(d) Use automatic tools in the development of compilers (e.g. Lex and Yacc).

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Students will learn, understand and explain the main techniques and algorithms used in compilers.	K1
1.2		
1.3		
1...		
2	**Skills :**	
2.1	Students learn how to use tools to generate lexical analyzers, parsers, translators and code generators.	S1
2.2		
2.3		
2...		
3	**Values:**	
3.1	Students use open source and current software tools to build a micro compiler.	C1
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Compilers: language translation, comparison of interpreters and compilers, language translation phases	3
2	Lexical Analysis: regular expressions role in lexical scanners, comparison of hand-made scanner and automatically generated scanners, formal definition of tokens, use of finite state automata.	6
3	Syntax Analysis: formal definition of grammars, BNF, bottom-up vs. top-down parsing, tabular vs. recursive-descent parsers, error handling	6
4	Parsers Implementation: tabular parsers, symbol tables, the use of tools in support of the translation process	6
5	Semantic Analysis: data types, type-checking models, type-checking algorithms.	3
6	Intermediate Representation, Code Generation: intermediate and object code, intermediate representations, implementation of code generators, tree walking; context sensitive translation	3
7	Code optimization: data-flow analysis; loop optimizations	3
8	Error Detection, Recovery, and Repair, Compiler Implementation	3
9	Review Week	
Total		33

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.1	Students will learn, understand and explain the main techniques and algorithms used in compilers.	Lectures, Discussions	Exams, Assignments, Participation
1.2			
…			
2.0	**Skills**		
2.1	Students learn how to use tools to generate lexical analyzers, parsers, translators and code generators.	Lectures, Labs	Exams, Assignments, Participation
2.2			
…			
3.0	**Values**		
3.1	Students use open source and current software tools to build a micro compiler.	Lectures, Labs	Lab Project
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Attendance and Participation	11	5%
2	Mid-Term Exam	8	20%
3	Mini-project, exercise	11	15%
4	Assignments, Quiz	5, 8	20%
5	Final Exam	11	40%
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Two office hours per week are dedicated to students.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	A V Aho, R Sethi and J D Ullman, "Compilers: principles, techniques and tools", Pearson Education Limited; Pearson New International Edition; 2nd ed. (2007). ISBN-10: 1292024348, ISBN-13: 978-1292024349
Essential References Materials	

Electronic Materials	• http://www.sdl.edu.sa • http://lms.mu.edu.sa
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Class Room. Lab.
Technology Resources (AV, data show, Smart Board, software, etc.)	Computer. LEX and YACC Tools.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Projector and Smart board.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Extent of achievement of course learning outcomes	Students	Indirect

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Science Department
Reference No.	CS Meeting # 7
Date	14-2-1441 H

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Software Modeling and Analysis
Course Code:	CS413
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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A. Course Identification **3**

6. Mode of Instruction (mark all that apply) 3

B. Course Objectives and Learning Outcomes **3**

1. Course Description 3

2. Course Main Objective 3

3. Course Learning Outcomes 4

C. Course Content **4**

D. Teaching and Assessment **5**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 5

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: 3 (3,0,1)
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 10
4. Pre-requisites for this course (if any)**:** **CS 360-Software Engineering**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description This course presents an integrated set of techniques for software analysis and design based on object-oriented concepts and the UML notation. Topics include introduction to object concepts, fundamentals of object oriented analysis and design process, use-case analysis, object modeling using behavioral techniques, design patterns, design quality and metrics.
2. Course Main Objective This course introduces students to the concepts of Software Modeling like object-oriented analysis and design, developing uses cases, interaction diagrams, class diagrams, activity diagram, software quality and software cost estimation methods.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO2 - Develop object-oriented designs by applying established design principles	S2
2.2	CLO3- Develop use-case and scenario descriptions of the requirements	S2
2.3	CLO4 - Develop richer descriptions of design models using UML diagrams	S2
2...		
3	**Competence:**	
3.1	CLO1-Understand the role of analysis and design in the software engineering lifecycle	C2
3.2	CLO5- Understand the role and influence of design patterns and frameworks in software design	C2
3.1	CLO1-Understand the role of analysis and design in the software engineering lifecycle	C2
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to object concepts	4
2	Fundamentals of object oriented analysis and design process	4
3	Inception, Understanding Requirements, Use-Case Model	4
4	Identifying Other Requirements, From Inception to Elaboration	4
5	Elaboration, Use-Case Model: Drawing System Sequence Diagrams, Domain Model: Visualizing Concepts, Adding Associations, Adding Attributes	4
6	Interaction Diagram Notation, GRASP: Designing Objects with Responsibilities	4
7	Determining Visibility, Creating Design Class Diagrams, Mapping Designs to Code	4
8	Designing Use-Case Realizations with GoF Design Patterns	4
9	Modeling Behavior in Statechart Diagrams	4
10	Designing the Logical Architecture with Patterns, Design quality and metrics	4
11	Revision	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			
2.0	**Skills**		
2.1	CLO2 - Develop object-oriented designs by applying established design principles	Classroom Teaching	Assignment, Mid Exam, Final Exam
2.2	CLO3- Develop use-case and scenario descriptions of the requirements	Classroom Teaching	Assignment, Mid Term,
2.3	CLO4 - Develop richer descriptions of design models using UML diagrams	Classroom Teaching	Assignment, Mid Exam, Case Study
3.0	**Competence**		
3.1	CLO1-Understand the role of analysis and design in the software engineering lifecycle	Classroom Teaching	Quiz, Mid Exam, Final Exam
3.2	CLO5- Understand the role and influence of design patterns and frameworks in software design	Classroom Teaching	Assignment, Final Exam
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week4, Week 9	10%
2	Assignments / Project / Lab	Week 7,8	20%
3	Mid Term Exam	Week 6	20%
4	Case Study	Week 9	10%
5	Final Exam	Week 12	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
Each student is allotted to an academic advisor for guidance and counselling.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", by Larman, Craig, 3rd edition, 2008

Essential References Materials	1. Computer Security: Art and Science (2 Volume Set) 1st Edition, Matt Bishop, Addison-Wesley Professional, 2015 2. Core Software Security: Security at the Source 1st Edition, James Ransome and AnmolMisra, Auerbach Publications, 2013. 3. Fundamentals of Information Systems Security, 2nd Edition, David Kim and Michael G. Solomon, Jones & Bartlett Learning, 2014.
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection, Free / Open source tools like Visio, Eclipse Plug-ins available for UML.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Learning Outcomes Feedback	Students	Survey
Final Exam evaluation	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	CS Council	
Reference No.		
Date		

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Artificial Intelligence	
Course Code:	CS424	
Program:	Computer Science	
Department:	Computer Science	
College:	Computer and Information Sciences	
Institution:	Majmaah University	

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A. Course Identification **3**

6. Mode of Instruction (mark all that apply) 3

B. Course Objectives and Learning Outcomes **3**

1. Course Description 3

2. Course Main Objective 3

3. Course Learning Outcomes 4

C. Course Content **4**

D. Teaching and Assessment **4**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 4

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: 3 (3,1,0)
2. Course type **a.** University ☐ College ☐ Department ☐ Others ☑ **Program** **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 11
4. Pre-requisites for this course (if any)**:** **MH121 – Discrete Mathematics**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	11
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviors on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously. The main research topics in AI include: problem solving, reasoning, planning, natural language understanding, computer vision, automatic programming, and machine learning, and so on.

2. Course Main Objective

(a) Equipping students with necessary knowledge and skills required to be successful in building much needed intelligent computer systems based on the solid foundations of Computer Science and Information Technology.
(b) Providing students techniques to develop, maintain, and utilize intelligent systems in many life applications.
(c) Familiarizing students with advanced topics in AI using Lisp and Prolog languages.

(d) Developing creative capacities for the design, implementation, and analysis of computer programs that reason and/or act intelligently
(e) Learning to analyze and experimentally evaluate designs and implementations of the intelligent computer programs.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	Students learn how to design, implement and evaluate an AI algorithm and write the program for the same.	S2
2.2	Students apply science theory and software development to find a solution of practical problem.	S4 [CS]
2.3	Students learn how to apply knowledge of computing to find the best solution to a certain problem.	S5
2...		
3	**Values:**	
3.1	Students will learn how to build and run an intelligent agent using specific hardware and software programming tools as a team.	V1
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction: Definitions, History of AI	4
2	Intelligent Agents	4
3	Problem Solving by Searching	8
4	Informed Search and Exploration	4
5	Constraint Programming	4
6	Knowledge Representation & Reasoning	4
7	Games & First Order Logic	4
8	Inference	4
9	Machine Learning	4
10	Present and Future of AI	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.1			
1.2			
…			
2.0	**Skills**		
2.1	Students learn how to design, implement and evaluate an AI algorithm and write the program for the same.	Mini Project, Lab Exercises	Lab Based Assignments, Mini Project
2.2	Students apply science theory and software development to find a solution of practical problem.	Mini Project, Graduation Project, Lab Exercises	Lab project
2.3	Students learn how to apply knowledge of computing to find the best solution to a certain problem.	Classroom Teaching	Midterm Exam, Final Exam
3.0	**Values**		
3.1	Students will learn how to build and run an intelligent agent using specific hardware and software programming tools as a team.	Mini Project, Lab Exercises	Oral Exam
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Exam 1	5	20%
2	Exam 2	8	20%
3	Lab Project	11	20%
4	Final Exam	12	40%
5			
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Two office hours per week are dedicated to students.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach", Prentice Hall; 3rd ed. (2009). ISBN-10: 0136042597, ISBN-13: 978-0136042594

Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom, lab, robots, PCs
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

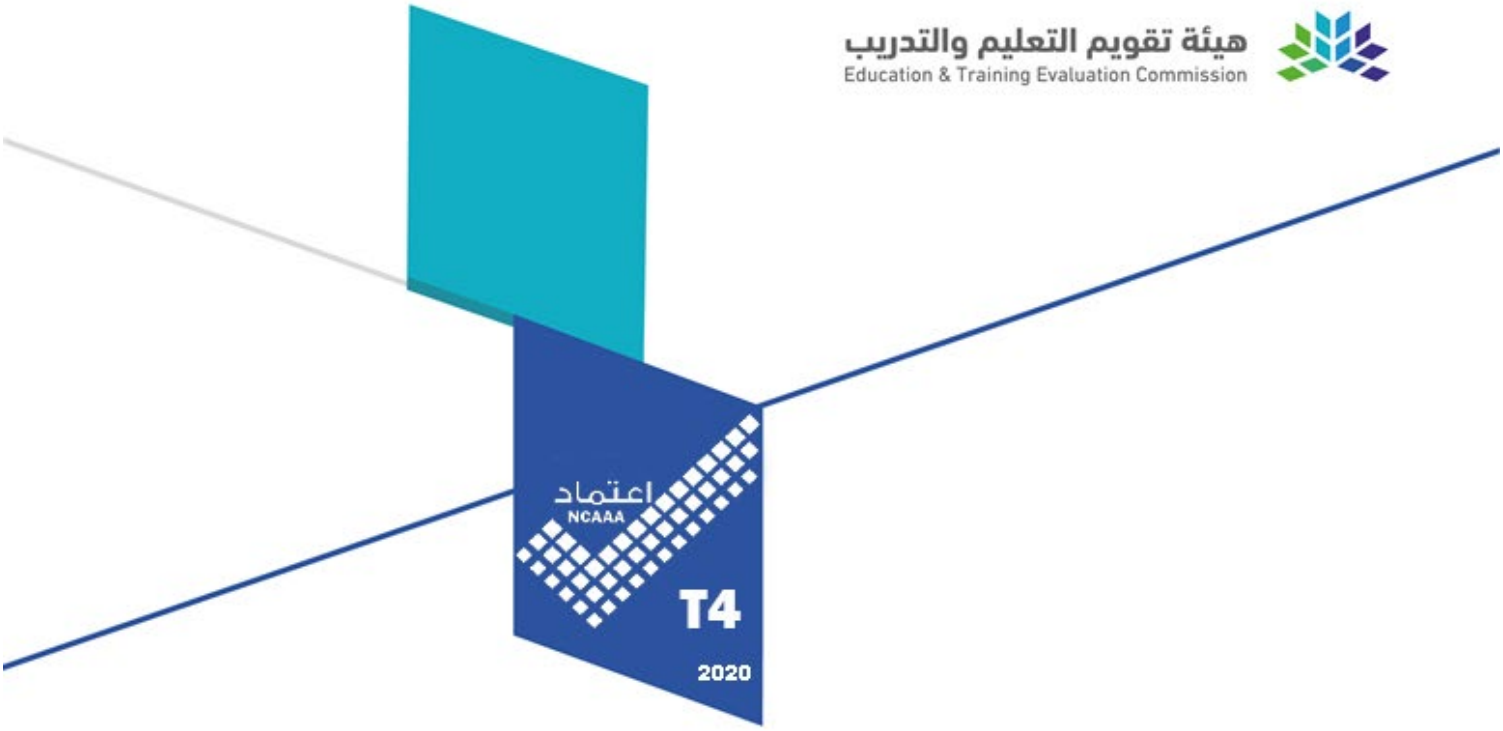
G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of assessment	Instructor	Direct
Achievement of CLOs	Instructor	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	



Course Specifications

Course Title:	Parallel and Distributed Computing
Course Code:	CS432
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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G. Course Quality Evaluation **7**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours: 3(3,0,1)
2. Course type **a.** University ☐ College ☐ Department ☐ Others ☒ X **b.** Required ☒ x Elective ☐
3. Level/year at which this course is offered: Level 12/Year 4
4. Pre-requisites for this course (if any)**: CS 322-Computer Organization**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces the techniques of designing efficient parallel algorithms and their implementation. This course gives a broad look on how parallel computers work and their importance in solving practical problems.

2. Course Main Objective

This course introduces students to Parallel and Distributed Processing concepts including concurrency and its management. Introduction to Multiprocessor & Multicomputer, Interconnection networks, models of parallel computation, Load balancing, distributed termination detection and synchronous and asynchronous parallelism.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO1-Appreciate and understand the importance of parallel computation in solving practical problems in Science and Engineering	S1
2.2	CLO2-Be able to select the proper parallel processing architecture based on performance requirements	S4
2.3	CLO3-Be able to develop a parallelization strategy for divide and conquer problems	S2
2.4	CLO4-Be able to develop, test and debug intermediate level message passing programs using C/MPI and OpenMP in a PC Cluster	S4
2.5	CLO5-Be able to compare the performance of alternative parallel processing strategies for a given problem in a PC cluster and GPU	S4
2.6		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Fundamentals of Parallel Processing : Motivating Parallelism, Scope of Parallel Computing, Implicit Parallelism: Trends in Microprocessor Architectures, Limitations of Memory System Performance, Physical Organization of Parallel Platforms Parallel machines and computation models, shared Address space.	**8**
2	Introduction to Multiprocessor & Multicomputer : Introduction to multi-core architectures, issues involved into writing code for multi-core architectures, Development of programs for these architectures, program optimizations techniques. Multiprocessors and Thread-Level Parallelism Introduction ,Symmetric Shared-Memory Architectures ,Performance of Symmetric Shared-Memory Multiprocessors, Distributed Shared Memory and Directory-Based Coherence , Synchronization, Multiprocessors vs. Message passing	**4**
3	Interconnection networks: Routing Mechanisms for Interconnection Networks Impact of Process-Processor Mapping and Mapping Techniques, Performance estimation methods	**4**

4	Graphics Processing Units and other parallel devices: Data-Stream-Based Architectures, GPU Programming Model, Dataflow, Vector Operations ,Matrix Vector Product, Graphics Pipeline	**8**
5	Message Passing methods and tools : Principles of Message-Passing Programming, The Building Blocks: Send and Receive Operations, MPI: the Message Passing Interface, Overlapping Communication with Computation Groups and Communicators	**8**
6	Partitioning, divide-and-conquer strategies :Introduction, numerical integration and bucket sort case studies	**4**
7	Data Parallel & synchronous computing: Introduction, PRAM models, The Bulk Synchronous Parallel Model, BSP algorithm, Data-parallel programming on MIMD computers	**8**
8	Load balancing, distributed termination detection: Introduction, Static and Dynamic load balancing, Dynamic Load Balancing of Unbalanced Computations Using Message Passing, Algorithms for distributed termination detection	**8**
9	Parallel Numerical and Image Processing Algorithms	**4**
10	Languages and language extensions, including Pthreads, OpenCL and CUDA	**4**
Total		60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			
2.0	**Skills**		
2.1	CLO1-Appreciate and understand the importance of parallel computation in solving practical problems in Science and Engineering	Classroom Teaching	Quiz, Mid Exam, Final Exam, Assignment
2.2	CLO2-Be able to select the proper parallel processing strategy that is expected to work best for solving a practical problem	Classroom Teaching	Quiz, Mid Exam, Final Exam
2.3	CLO3-Be able to develop a parallelization strategy for numerical and other algorithms for science and engineering problems such as difficult integral, performing monte carlo simulation	Classroom Teaching	Quiz, Mid Exam, Final Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.4	CLO4-Be able to develop, test and debug intermediate level message passing programs using C/MPI in a PC Cluster and write a Data Parallel Program for GPU	Lab Exercises and Demonstration of experiments	Quiz and Homework
2.5	CLO5-Be able to compare the performance of alternative parallel processing strategies for a given problem in a PC cluster and GPU	Classroom Teaching	Quiz, Mid Exam, Final Exam, Assignment
2.6	CLO6-Be able to evaluate how the performance is affected as the problem size increases (Scalability analysis)	Classroom Teaching	Quiz, Mid Exam, Final Exam, Assignment
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 3, Week 8	10%
2	Assignments	Week 4, Week 9	20%
3	Mid Term Exam	Week 6	20%
4	Homework	Week 10	5%
5	Exercise	Every Week	5%
6	Final Exam	Week 12	40%
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counselling.
- Available for a minimum of 4 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / Blackboard/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Introduction to Parallel Computing, (Second Edition) Ananth Grama, Anshul Gupta, George Karypis, and Vipin Kumar. Addison-Wesley, 2003. ISBN 0-201-64865-2
Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Class Room, PC**
Technology Resources (AV, data show, Smart Board, software, etc.)	**LCD Projector, Dev C++/Visual studio C++**
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Examination, Midterm Exam & Quizzes	Instructor	Direct
Survey	Students	Indirect
Final Examination Marks	Peers	Verification of Marks
Course Report	Quality Unit	Checklist quality reports

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Computer Vision
Course Code:	CS 461
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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F. Learning Resources and Facilities **5**

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G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: 3
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☐ Elective ☑
3. Level/year at which this course is offered: Track
4. Pre-requisites for this course (if any)**: CS 231**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	%100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22
2	**Laboratory/Studio**	22
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course provides an introduction to computer vision, including fundamentals of image formation, camera imaging geometry, feature detection and matching, stereo, motion estimation and tracking, image classification, scene understanding, and deep learning with neural networks. Implementation of various algorithms will be done in python language.

2. Course Main Objectives

1. To introduce to the theoretical and practical aspects of computing with images
2. To cover the techniques of image formation, measurement, and analysis
3. To expose to the common methods for robust image matching and alignment
4. Highlight the geometric relationships between 2D images and the 3D world
5. Giving exposure to object and scene recognition and categorization from images

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO1: Students understand the foundation of image formation, measurement, and analysis	S4
2.2	CLO2: Student's Be familiar with both the theoretical and practical aspects of computing with images	S1
2.3	CLO3: Students understand how to track, identify and recognize objects from images	S1
2...	CLO4: Students Understand how deep learning models have evolved from a generalization of traditional computer methods	S2
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Image formation and perception, image representation	2
2	Image geometric transformations, image registration	2
3	Edge detection, image segmentation	2
4	Linear filters, Binary image analysis,	2
5	Background subtraction	2
6	Object recognition, template matching, classification	2
7	Object detection and tracking	2
8	Camera models, stereo vision	2
9	Supervised classification algorithms	2
10	Visual attributes, Dimensionality reduction	2
11	Deep learning	2
Total		22

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.0	**Skills**		
2.1	CLO1: Students understand the foundation of image formation, measurement, and analysis	Classroom Teaching	Class Test, Mid Exam, Final Exam
2.2	CLO2: Students Be familiar with both the theoretical and practical aspects of computing with images	Classroom Teaching	Class Test, Mid Exam, Final Exam
…	CLO3: Students understand how to track, identify and recognize objects from images	Classroom Teaching	Class Test, Mid Exam, Final Exam
	CLO4: Students Understand how deep learning models have evolved from a generalization of traditional computer methods	Classroom Teaching	Class Test, Mid Exam, Final Exam
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 5, 10,13	20 %
2	Assignments	Week 7, 13	20%
3	Midterm Exam	Week 8	20 %
4	Final Exam	Week 16	40 %
5			
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
Each student is allotted to an academic advisor for guidance and counseling.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Computer Vision: Algorithms and Applications by Richard Szeliski, Springer,2011, ISBN 978-1-84882-934-3

Essential References Materials	Computer Vision, A Modern Approach, Forsyth and Ponce, 2nd ed., 2011
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom, laboratories
Technology Resources (AV, data show, Smart Board, software, etc.)	PC with Windows/Linux, LCD Projector, Smart Board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Review Committee member	Review
Course Feedback	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Intelligent Agents
Course Code:	CS462
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 5

2. Facilities Required 5

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours:	**3(3,1,0)**
2. Course type	
a.	University ☐ College ☐ Department ☒ Others ☐
b.	Required ☐ Elective ☒
3. Level/year at which this course is offered:	**Track**
4. Pre-requisites for this course (if any)**:**	**CS424**
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	11
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

One of the core abilities of an intelligent agent is to be able to solve problems. Search is a general-purpose technique for finding solutions to problems. However, these search spaces can be quite large and we need to be able to reduce the size of the search space in order to solve problems in a reasonable amount of time and space. We will be exploring several state-of-the-art techniques for reducing the size of these search spaces. A main theme in this field involves strategic agents where game theory is an important tool. We will be looking at the algorithmic and game-theoretic foundations of multi-agent systems in this course. Applications of multi-agent systems range from negotiation, cooperating robots, market and auction analysis, to security.

2. Course Main Objective

The students will be able to:

1. explain important challenges of MAS
2. phrase MAS scenarios using the language of game theory
3. understand current research papers in Heuristic Search
4. understand some of the tradeoffs involved in using current techniques to reduce the problem space sizes

3. Course Learning Outcomes

	CLOs	AlignedPLOs
1	**Knowledge and Understanding**	
1.1	Understand what a multi-agent system (MAS) is and when they are useful	K1
1...		
2	**Skills :**	
2.1	Be able to apply some well-known distributed optimization algorithms	S4
2.2	Build simple agents and multi-agent systems using basic AI concepts	S2
2.3	identify or derive equilibria in normal form or extensive form games	S1
2...		
3	**Values:**	
3.1		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Multi-agent System	4
2	Distributed Optimization Problem	6
3	Agent Knowledge Representation, Reasoning, and Adaptability	4
4	Introduction to Game	5
5	Finding Equilibria in Game	5
6	Reinforcement Learning	5
7	Review of Search Techniques	5
8	Mobile Agents	5
9	Agent Applications	5
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
1.0	**Knowledge and Understanding**		
1.1	Understand what a multi-agent system (MAS) is and when they are useful	Classroom Teaching	Assignment, Quiz, Mid Exam, Final Exam
…			
2.0	**Skills**		
2.1	Be able to apply some well-known distributed optimization algorithms	Classroom Teaching	Quiz, Mid Exam, Final Exam
2.2	Build simple agents and multi-agent systems using basic AI concepts	Classroom Teaching	Assignment, Lab Exercises, Final Exam
2.3	identify or derive equilibria in normal form or extensive form games	Classroom Teaching	Quiz, Assignment Mid Exam, Final Exam

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	**5,9**	10%
2	Mid Term Exam	**8**	20%
3	Assignment	**3, 6, 9**	10%
4	Lab Based Exercises	**Weekly**	20%
5	Final Exam	11	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counselling
- Available for a minimum of 4 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / D2L/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	An Introduction to Multiagent Systems, Wooldridge, Wiley 2009. ISBN-13: 978-0470519462, ISBN-10: 9780470519462
Essential References Materials	Artificial Intelligence: a modern approach, Russel & Norvig, Prentice Hall 2015. ISBN-10: 9789332543515, ISBN-13: 978-9332543515
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom, PC Laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector

Item	Resources
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Learning Outcomes Feedback	Students	Survey
Final Exam evaluation	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes,Quality oflearning resources, etc.)
Evaluators (Students,Faculty, Program Leaders,Peer Reviewer, Others (specify)
Assessment Methods(Direct, Indirect)

H. Specification Approval Data

Council / Committee	CS Council
Reference No.	
Date	SEPT 2022

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Machine Learning**
Course Code:	**CS 463**
Program:	**Computer Science**
Department:	**Computer Science**
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

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D. Teaching and Assessment **5**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 5

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours:	3 (3+0+1)
2. Course type	
a.	University ☐ College ☑ Department ☐ Others ☐
b.	Required ☑ Elective ☐
3. Level/year at which this course is offered:	Level-9
4. Pre-requisites for this course (if any)**:**	CS 120
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	11
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

The course objective is to study the theory and practice of constructing algorithms that learn (functions) from data. Machine learning is a field with goals overlapping with other disciplines such as statistics, algorithms, engineering, or optimization theory. It also has wide applications in a number of scientific areas such as finance, life sciences, social sciences, or medicine. Python or R Language will be used for implementation of machine learning algorithms.

2. Course Main Objective

1. To know the mathematical principles required for machine learning
2. To understand various classification algorithms
3. To understand different regression algorithms and neural networks

4. To use ensemble models to solve problems in machine learning
5. To understand practical aspects of machine learning

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
	CLO1: To know the mathematical principles required for machine learning	S1
2.1	CLO2: To understand various classification algorithms	S2
2.2	CLO3: To understand different regression algorithms and neural networks	S2
2.3	CLO4: To use ensemble models to solve problems in machine learning	S2
2.4	CLO5: To understand practical aspects of machine learning	S2
3	**Competence:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Machine Learning and its applications	4
2	Supervised learning and Bayesian Decision theory	4
3	Parametric methods	4
4	Nonparametric methods	4
5	Dimensionality reduction	4
6	Clustering	4
7	Decision trees	4
8	Multilayer perceptrons -Neural Network	4
9	Kernel machines	4
10	Ensemble methods : Bagging, Boosting – Random Forests	4
11	Practical aspects in machine learning Data preprocessing-overfitting-accuracy estimation, parameter and model selection	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1			
1.2			
2.0	**Skills**		
2.1	CLO2: To understand various classification algorithms	Classroom Teaching LAB teaching	Test Exam, Mid Exam ,Lab Assignment, Mid Exam, Final Exam, Project
2.2	CLO3: To understand different regression algorithms and neural networks	Classroom Teaching LAB teaching	Test Exam, Mid Exam ,Lab Assignment, Mid Exam, Final Exam, Project
2.3	CLO5: To understand practical aspects of machine learning	Classroom Teaching LAB teaching	Test Exam, Mid Exam ,Lab Assignment, Mid Exam, Final Exam, Project
3.0	**Competence**		
3.1	CLO1: To know the mathematical principles required for machine learning	Classroom Teaching	Test Exam, Mid Exam , , Mid Exam, Final Exam
3.2	CLO4: To use ensemble models to solve problems in machine learning	Classroom Teaching	Test Exam, Mid Exam , , Mid Exam, Final Exam
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes/ Test	Week 4,12	20%
3	Mid Term	Week 6	20%
4	Project/ Lab Assignment	Every Week	20%
5	Final Exam	Week 12	40%
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counselling.

- Available for a minimum of 4 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / D2L/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Introduction to Machine Learning, Ethem Alpaydın, MIT Press, 3rd ed, 2014, ISBN: 978-0-262-02818-9
Essential References Materials	•**Jure Leskovek, Anand Rajaraman and Jeffrey Ullman. Mining of Massive Datasets. v2.1, Cambridge University Press. 2014.** •**Kevin P. Murphy. Machine Learning: A Probabilistic Perspective. ISBN 0262018020. 2013** *NINA ZUMEL, JOHN MOUNT, Practical Data Science with R, Manning Publications Co.,2014*
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms, laboratories
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, LCD Projector, Anaconda Framework, Python 3, Blackboard
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet connection

G. Course Quality Evaluation

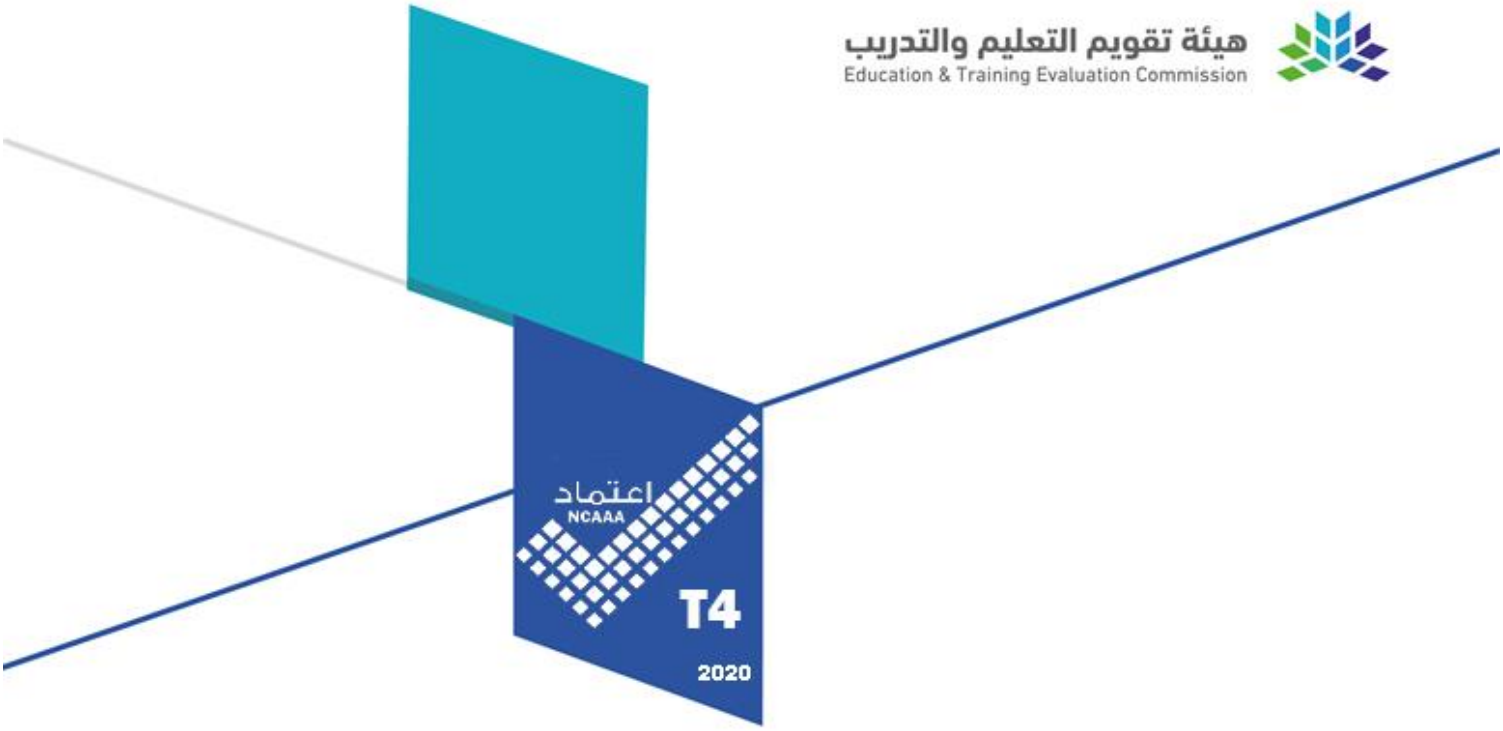
Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Direct Review
Course Feedback	Students	Indirect course Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	CS Council
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Natural Language Processing
Course Code:	**CS464**
Program:	**B.Sc Computer Science**
Department:	**Information Technology**
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

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2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: 3(3,1,0)
2. Course type **a.** University ☐ College ☐ Department ☐ Others ☑ **b.** Required ☐ Elective ☑
3. Level/year at which this course is offered: Level 12/Year 4
4. Pre-requisites for this course (if any)**: CS461**
5. Co-requisites for this course (if any)**: Nil**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	55	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	44
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	55

B. Course Objectives and Learning Outcomes

1. Course Description

Natural Language Processing addresses fundamental questions at the intersection of human languages and computer science. How can computers acquire, comprehend and produce English? How can computational methods give us insight into observed human language phenomena? In this interdisciplinary introductory course, you will learn how computers can do useful things with human languages, such as translation between different languages, filter junk email, and find the main topics in the day's news. The intent of the course is to present a fairly broad graduate-level introduction to Natural Language Processing (NLP, a.k.a. computational linguistics), the study of computing systems that can process, understand, or communicate in human language. The primary focus of the course will be on understanding various NLP tasks as listed on the course syllabus, algorithms for effectively solving these problems, and methods for evaluating their performance.

2. Course Main Objective

1. To learn about Regular Expressions, Text Normalization and Edit Distance
2. To understand String Edit Distance and Alignment
3. To Compute Context Free Grammars

4. To learn to understand about Part of Speech Tagging using Hidden Markov Models, Language modeling and Naive Bayes, Probability Theory
5. To design probabilistic Context Free Grammars
6. To understand Maximum Entropy Classifiers and Machine Translation

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	To understand major NLP issues and solutions	K1
1.2		
1.3		
1...		
2	**Skills :**	
2.1	To apply programming techniques to implement NLP algorithms	S4
2.2	To asses NLP problems and find solutions	S5
2.3		
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction and Overview	4
2	Regular Expressions, Text Normalization, Edit Distance	4
3	String Edit Distance and Alignment	4
4	Context Free Grammars	4
5	Probability Theory	4
6	Language modeling and Naive Bayes	8
7	Part of Speech Tagging and Hidden Markov Models	8
8	Probabilistic Context Free Grammars	6
9	Maximum Entropy Classifiers	6
10	Machine Translation	7
Total		55

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	CLO1- To understand major NLP issues and solutions	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
1.2			

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
…			
2.0	**Skills**		
2.1	CLO2-To apply programming techniques to implement NLP algorithms	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
2.2	CLO3-To asses NLP problems and find solutions	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
…			
3.0	**Values**		
3.1	Nil		
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 4, 10,13	10 %
2	Assignments	Week 7, 13	10%
3	Midterm Exam	Week 8	20 %
4	Exercise	Every Week	20%
5	Final Exam	Week 16	40 %

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Each student is allotted to an academic advisor for guidance and counseling

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	1. Jurafsky and Martin, “SPEECH and LANGUAGE PROCESSING: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition”, Second Edition, McGraw Hill, 2008. 2. Manning and Schutze, "Statistical Natural Language Processing", MIT Press; 1st edition (June 18, 1999), ISBN: 0262133601
Essential References Materials	

Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Classroom**
Technology Resources (AV, data show, Smart Board, software, etc.)	**PC with Windows/Linux, LCD Projector, Smart Board**
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	**Internet Connection**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Review Committee member	Review
Course Feedback	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Robotics
Course Code:	CS 465
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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C. Course Content **4**

D. Teaching and Assessment **5**

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2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **6**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours: 3(3,0,1)
2. Course type **a.** University ☐ College ☐ Department ☐ Others ☒ **b.** Required ☐ Elective ☒
3. Level/year at which this course is offered: Level 12/Year 4
4. Pre-requisites for this course (if any)**: CS 320**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	55	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	44
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	55

B. Course Objectives and Learning Outcomes

1. Course Description

An introduction to the fundamentals of robotics. Students will learn the fundamentals of robotics, including kinematics, inverse kinematics, Jacobian, velocity, configuration space, motion planning and path planning algorithms.

2. Course Main Objective

1) Model the kinematics of robotic systems
2) Compute end-effector position and orientation from joint angles of a robotic system
3) Compute the joint angles of a robotic system to reach the desired end-effector position and orientation
4) Compute the linear and angular velocities of the end-effector of a robotic system from the joint angle velocities
5) Convert a robot's workspace to its configuration space and represent obstacles in the configuration space

6) Compute valid path in a configuration space with motion planning algorithms
7) Apply the generated motion path to the robotic system to generate a proper motion trajectory
8) Apply the learned knowledge to several robotic systems: including robotic manipulators, humanoid robots

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO5- Apply the learned knowledge to several robotic systems: including robotic manipulators, humanoid robots.	K1
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO1: Understand background of robotics and various types of robots	S1
2.2	CLO2: Study about physical structure, orientation of robots, joint angle movement	S1
2.3	CLO3: 3. Study techniques for Computing the linear and angular velocities of the end-effector of a robotic system from the joint angle velocities	S5
2.4	CLO4: Able to apply the generated motion path to the robotic system to generate a proper motion trajectory	S5
2.5		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Robotics	8
2	Representing positions and rotations	8
3	Rotational transformations and parameterizations ofrotations	4
4	Homogeneous transformations, kinematic chains andDH convention	4
5	DH convention and forward kinematics	4
6	Inverse kinematics and angular velocity and Kinematicslab	4
7	The Jacobian matrix	4
8	Trajectory design and configuration space	4
9	Configuration space with examples and motionplanning introduction	4
10	Motion planning: potential field and PRM ,Motionplanning roadmap and motion planning review	4

11	Mobile robot, sensors and actuators	3
Total		55

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	CLO5- Apply the learned knowledge to several robotic systems: including robotic manipulators, humanoid robots.	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
1.2			
…			
2.0	**Skills**		
2.1	CLO1: Understand background of robotics and various types of robots	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
2.2	CLO2: Study about physical structure, orientation of robots, joint angle movement	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
2.3	CLO3: 3. Study techniques for Computing the linear and angular velocities of the end-effector of a robotic system from the joint angle velocities	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
2.4	CLO4: Able to apply the generated motion path to the robotic system to generate a proper motion trajectory	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
2.5			
3.0	**Values**		
3.1			
3.2			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 4, 10,13	15 %
2	Assignments	Week 7, 13	15%
3	Midterm Exam	Week 8	20 %
4	Exercise	Every Week	10 %
5	Final Exam	Week 16	40 %
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice : Each student is allotted to an academic advisor for guidance and counseling

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Robot Modeling and Control by Mark M. Spong, Seth Hutchinso, and M. Vidyasagar (ISBN: 9780471649908)
Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Classroom**
Technology Resources (AV, data show, Smart Board, software, etc.)	**PC with Windows/Linux, LCD Projector, Smart Board**
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	**Internet Connection**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Review Committee member	Review
Course Feedback	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Introduction to Data Science**
Course Code:	**CS 471**
Program:	**Computer Science**
Department:	**Computer Science**
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

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C. Course Content **4**

D. Teaching and Assessment **5**

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2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **6**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 7

G. Course Quality Evaluation **7**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours:	3 (3+0+1)
2. Course type	
a.	University ☐ College ☑ Department ☐ Others ☐
b.	Required ☑ Elective ☐
3. Level/year at which this course is offered:	Level-5 / 3
4. Pre-requisites for this course (if any)**:**	CS 120
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22
2	**Laboratory/Studio**	22
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

Data Science is the study of the generalizable extraction of knowledge from data. Being a data scientist requires an integrated skill set spanning mathematics, statistics, machine learning, databases and other branches of computer science along with a good understanding of the craft of problem formulation to engineer effective solutions. Students will learn concepts, techniques and tools they need to deal with various facets of data science practice, including data collection and integration, exploratory data analysis, predictive modeling, descriptive modeling, data product creation, evaluation, and effective communication.

2. Course Main Objective

1) To cover the basics of data science

2) To give overview of statistical parameters used in data science
To demonstrate how to implement various machine learning algorithms for data analysis 4) To implement several machine learning algorithms in R

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	CLO1: Identify probability distributions commonly used as foundations for statistical modeling	K1
1.2	CLO4: Identify basic Feature Selection algorithms Decision Trees, Random Forests and use in applications	K1
1.3		
1...		
2	**Skills :**	
2.1	CLO2: Apply basic tools (plots, graphs, summary statistics) to carry out Exploratory Data Analysis.	S2
2.2	CLO3: Apply basic machine learning algorithms (Linear Regression, k-Nearest Neighbors (kNN), k-means, Naive Bayes) for predictive modeling.	S2
2.3	CLO5: Use R language to carry out basic statistical modeling and analysis	S2
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction: What is Data Science? - Big Data and Data Science hype - Current landscape of perspectives, Skill sets needed	4
2	Statistical Inference - Populations and samples - Statistical modeling, probability distributions, fitting a model	4
3	Data Design and Implementation (algorithm analysis, growth of functions, ADTs)	4
4	Exploratory Data Analysis and the Data Science Process	4
5	Basic tools (plots, graphs and summary statistics) of EDA	4
6	Three Basic Machine Learning Algorithms - Linear Regression Naive Bayes and why it works for Filtering Spam	4

7	k-Nearest Neighbors (k-NN)& k-means	4
8	One More Machine Learning Algorithm and Usage in Applications , Filtering Spam - Why Linear Regression and k-NN are poor choices for Filtering Spam	4
9	Algorithmic ingredients of a Recommendation Engine - Dimensionality Reduction - Singular Value Decomposition - Principal Component Analysis	4
10	Data Visualization - Basic principles, ideas and tools for data visualization	4
11	Data Science and Ethical Issues - Discussions on privacy, security, ethics	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1	CLO1: Identify probability distributions commonly used as foundations for statistical modeling	Classroom Teaching and Laboratory practice	Midterm Exam, Quizzes, Final Exam
2.0	**Skills**		
2.1	CLO2: Apply basic tools (plots, graphs, summary statistics) to carry out Exploratory Data Analysis.	Classroom Teaching and Laboratory practice	Midterm Exam, Quizzes, Final Exam Lab Exercise
2.2	CLO3: Apply basic machine learning algorithms (Linear Regression, k-Nearest Neighbors (KNN), k-means, Naive Bayes) for predictive modeling.	Classroom Teaching and Laboratory practice	Lab Exercise
2.3	CLO4: Identify basic Feature Selection algorithms Decision Trees, Random Forests and use in applications	Classroom Teaching and Laboratory practice	Midterm Exam, Quizzes, Final Exam Lab Exercise
2.4	CLO5: Use R language to carry out basic statistical modeling and analysis.	Classroom Teaching and Laboratory practice	Midterm Exam, Quizzes, Final Exam Lab Exercise
3.0	**Values**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	Week 3	10%
2	Lab Assignment 1	Week 3	10%
3	Mid Term	Week 6	20%
4	Lab Assignment 1	Week 7	10%
5	Quiz 2	Week 8	10%
6	Final Exam	Week 12	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counselling.
- Available for a minimum of 4 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / D2L/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	**Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline. O'Reilly. 2014**
Essential References Materials	**•Jure Leskovek, Anand Rajaraman and Jeffrey Ullman. Mining of Massive Datasets. v2.1, Cambridge University Press. 2014.** **•Kevin P. Murphy. Machine Learning: A Probabilistic Perspective. ISBN 0262018020. 2013** *NINA ZUMEL, JOHN MOUNT, Practical Data Science with R, Manning Publications Co.,2014*

Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms, laboratories
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, LCD Projector, 'R' programming Tool, Blackboard
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Direct Review
Course Feedback	Students	Indirect course Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Big Data Analytics**
Course Code:	**CS 472**
Program:	Computer Science/ Information Technology
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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D. Teaching and Assessment **4**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 4

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours:	3(3,1,0)
2. Course type	
a.	University ☐ College ☐ Department ☒ Others ☐
b.	Required ☐ Elective ☒
3. Level/year at which this course is offered:	Track
4. Pre-requisites for this course (if any)**:**	STAT 102
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	14
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course is designed for students who have no previous knowledge of data analytics but wish to acquire these skills in a short period of time. These students will learn how to analyze large data sets and identify patterns that will improve any company's and organization decision-making process.

2. Course Main Objective

1. To understand the basics of big data analytics
2. To understand the data sampling, statistical analysis, visual data exploration
3. To apply predictive analytics techniques for real time problems
4. To perform descriptive and social analytics
5. To use big data tools and techniques

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO1: To understand the basics of big data analytics	K1
1.2	CLO2: To understand the data sampling, statistical analysis, visual data exploration	K1
1.3		
1...		
2	**Skills :**	
2.1	CLO3: To apply predictive analytics techniques for real time problems	S2
2.2	CLO4: To perform descriptive and social analytics	S2
2.3	CLO5: To use big data tools and techniques	S2
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Big Data and Analytics Example Applications, Analytics Process Model, Analytical Model Requirements	3
2	Data Collection, Sampling and Preprocessing, Types of Data Sources, Sampling, Types of Data Elements	4
3	Visual Data Exploration and Exploratory, Statistical Analysis, Missing Values, Outlier Detection and Treatment, Standardizing Data, Categorization	5
4	Predictive Analytics-Linear Regression, Logistic Regression, Decision Trees	6
5	Neural Networks, Support Vector Machines	6
6	Ensemble Methods, Multiclass Classification Techniques, Evaluating Predictive Models	6
7	Social Network Analytics, Social Network Definitions, Social Network Metrics, Social Network Learning	5
8	Web Analytics, Social Media Analytics	5
9	Big Data Tools and Techniques, Understanding Big Data Storage.	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.1	CLO1: To understand the basics of big data analytics	Classroom Teaching	Mid Exam, Final Exam
1.2	CLO2: To understand the data sampling, statistical analysis, visual data exploration	Classroom Teaching	Mid Exam, Final Exam
…			
2.0	**Skills**		
2.1	CLO3: To apply predictive analytics techniques for real time problems	Classroom Teaching and Lab Exercises	Lab Based Assignments, Mid Exam, Final Exam
2.2	CLO4: To perform descriptive and social analytics	Classroom Teaching and Lab Exercises	Lab Based Assignments, Mid Exam, Final Exam
2.3	CLO5: To use big data tools and techniques	Classroom Teaching and Lab Exercises	Lab Based Assignments
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	Week 2	5%
2	Assignment 1	Week 3	5%
3	Lab Exercise	Week 5	5%
4	Lab Exercise	Week 6	5%
5	Midterm Exam	Week 7	20%
6	Assignment 2	Week 7	5%
7	Quiz 2	Week 8	5%
8	Assignment 3	Week 9	5%
9	Lab Exam	Week 11	5%
10	Final Exam	Week 12	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Students can meet the faculty during advising hours or whenever the faculty is in the office.

Office Hours: 4 Hours/Week

Students also can email the faculty anytime during the weekdays

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Analytics in a Big Data World, Wiley 2014, Bart Baesens
Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom and laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show and Smart Board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Python

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Evaluation	Peers	Verification of Marks
Course Report Verification	Quality Coordinator	Check List

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Probability and Statistics for Data Science
Course Code:	CS473
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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A. Course Identification

1. Credit hours: **3 (2,2,0)**
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☐ Elective ☒
3. Level/year at which this course is offered: Level 9
4. Pre-requisites for this course (if any)**:** **STAT102**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	%100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22
2	**Laboratory/Studio**	22
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course is designed for students who have no previous knowledge of data analytics but wish to acquire these skills in a short period of time. These studentswill learn how to analyze large data sets and identify patterns that will improve any company's and organization decision-making process

2. Course Main Objective

1. 1 To provide the conceptual knowledge data science.
2. To provide the important and useful from the data science perspective.
3. To develop the skills of applying the techniques & tools of statistical practice and empirical research.
4. To provide the knowledge and applications of software package (R- Language).

3. Course Learning Outcomes

	CLOs	AlignedPLOs
1	**Knowledge and Understanding**	
1.1	To explore and analyze the data. .	K1
1...		
2	**Skills :**	
2.1	To model projects (whether in data science or in research) with the statistical tool among predictors, and between predictors and a target variable.	S2
2.2	To apply the sampling techniques from the Big Data projects.	S4
2.3	To design an experiment for test of the hypothesis.	S2
2.4	To take the automated decision faced with a problem	S2
2.5	To apply the basic statistical techniques on data, using statistical software package (R).	S1
2...		
3	**Values:**	
3.1		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Data Sciences and Overview of R	4
2	Exploratory Data Analysis	4
3	Probability Review and Continous Random Variables	4
4	Discrete Random Variables and Probability Distributions	4
5	Sampling Distributions	4
6	Confidence Interval / Hypothesis Testing	4
7	ANOVA	4
8	Correlation & Regression	4
9	Classification	4
10	Statistical Machine Learning	4
11	Unsupervised Learning	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
1.0	**Knowledge and Understanding**		
1.1	To explore and analyze the data. .	Classroom Teaching	Assignment, Quiz, Mid Exam, Final Exam
1.2			
2.0	**Skills**		
2.1	To model projects (whether in data	Classroom Teaching	Quiz, Final Exam,

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
	science or in research) with the statistical tool among predictors, and between predictors and a target variable.		Lab Based exercises
2.2	To apply the sampling techniques from the Big Data projects.	Classroom Teaching	Assignment, Lab Exercises, Final Exam
2.3	To design an experiment for test of the hypothesis.	Classroom Teaching	Quiz, Mid Exam, Final Exam
2.4	To take the automated decision faced with a problem	Classroom Teaching	Quiz, Final Exam, Lab Based Exercises
2.5	To apply the basic statistical techniques on data, using statistical software package (R).	Classroom Teaching	Assignment, Lab Exercises, Final Exam
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	**4, 8**	10%
2	Mid Term Exam	**6**	20%
3	Assignment	**3, 5, 9**	10%
4	Lab Based Exercises	**Weekly**	20%
5	Final Exam	12	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counselling
- Available for a minimum of 4 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / D2L/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Peter Bruce and Andrew Bruce, Practical Statistics for Data Scientists, O'Reilly Media, 2017, 978-1-491-95296-2
Essential References Materials	Colin O. Wu Xin Tian, Nonparametric Models for Longitudinal Data with Implementation in R, CRC Press, 978-1-4665-1600-7 Hongshik Ahn, Probability and Statistics for Science and Engineering with Examples in R [2nd ed.] Cognella,2018 978-1-5165-3111-0 Jay L. Devore, Probability and Statistics for Engineering and the Sciences. 9th Edition, Cengage Learning. ISBN: 1305251806.
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom, PC Laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

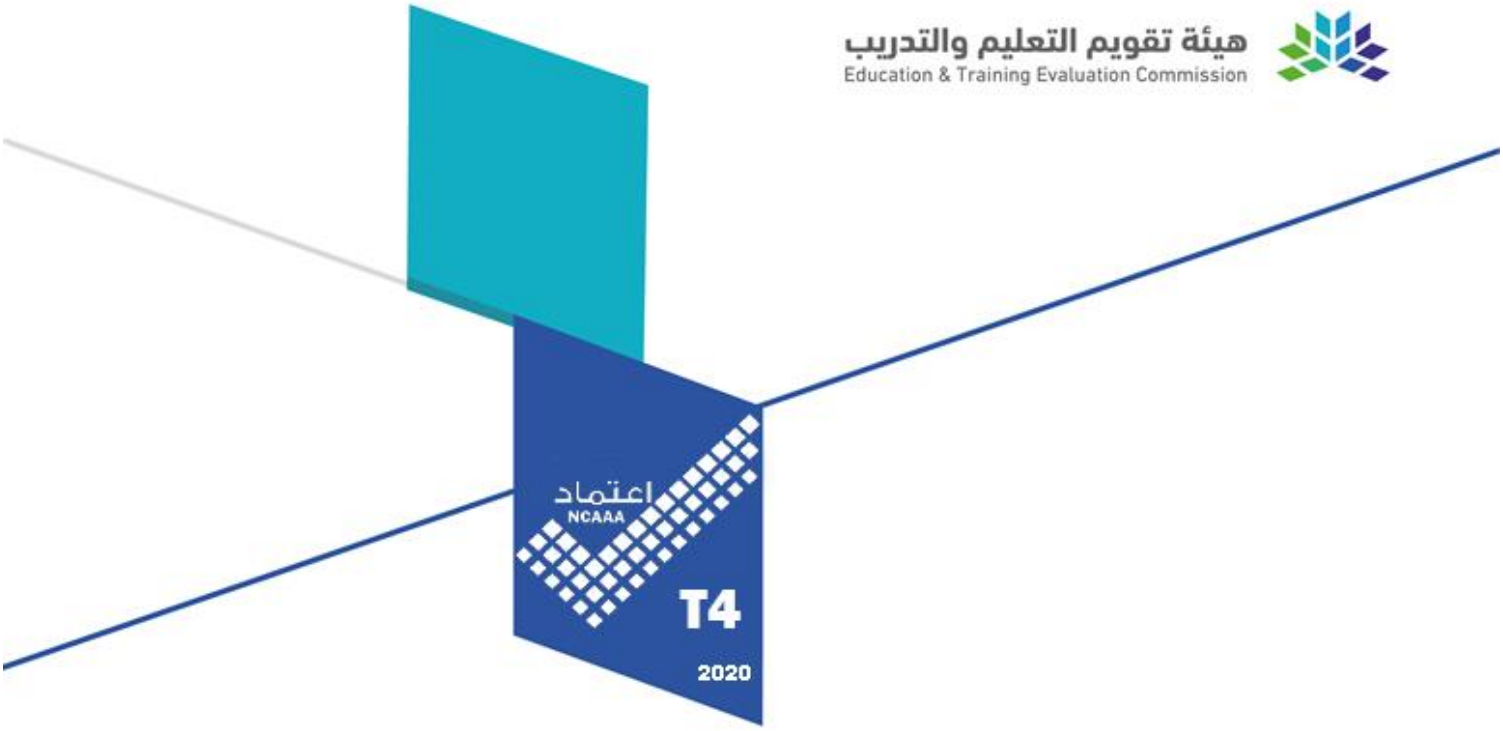
G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Learning Outcomes Feedback	Students	Survey
Final Exam evaluation	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes,Quality oflearning resources, etc.)
Evaluators (Students,Faculty, Program Leaders,Peer Reviewer, Others (specify)
Assessment Methods(Direct, Indirect)

H. Specification Approval Data

Council / Committee	CS Council
Reference No.	
Date	Nov - 2022



Course Specifications

Course Title:	**Data Visualization**
Course Code:	**CS 474**
Program:	**Computer Science**
Department:	**Computer Science**
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

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C. Course Content **4**

D. Teaching and Assessment **5**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 5

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours: 3 (3, 0, 1)
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level-5 / 3
4. Pre-requisites for this course (if any)**:** CS 120
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22
2	**Laboratory/Studio**	22
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description **This course covers the concepts of data visualization techniques in the form of plots used to show the relationships in the data. Different plots and their importance will be covered. Data visualization techniques will be implemented in R or Python.**
2. Course Main Objective 1) To be able to use R Studio for data loading and transformation. 2) To explore the data using bar chart, histogram, boxplot. 3) To be able to visualize data using scatterplot. 4) To be able to apply data visualization techniques in case studies

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO1- To be able to use R Studio for data loading and transformation.	S2
2.2	CLO2- To explore the data using bar chart, histogram, boxplot.	S2
2.3	CLO3- To be able to visualize data using scatterplot.	S2
2...	CLO4- To be able to apply data visualization techniques in case studies	S1
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to RStudio- Creating variables and assigning data, vectors and factors, lists, data classes, Looping statements, decision support statements, What is tidyverse?	3
2	Data to Insights to Decisions Data Exploration and Visualization with R, Installing and loading tidyverse, Loading and examining a Dataset, Grouping and summarizing a dataset, Plotting a dataset	3
3	Loading Data into R: Loading a csv file, Using readr to load data	3
4	Transforming Data: Filtering records to create a subset, Narrowing the list of columns with select(), Summarizing and Grouping	3
5	Creating Tidy Data: Gathering, Spreading, Uniting	3
6	Data Exploration Techniques in R: Bar Chart, Histogram	3
7	Box Plots, 2D bin and hex charts, Summary statistics	3
8	Data Visualization Techniques: scatterplot, Adding a regression line	3
9	Plotting categories, Labeling the graph, Legend layouts, density plots.	3
10	Visualizing Geographic Data with ggmap: Creating a basemap, Adding operational data layers	3
11	R Markdown: Creating an R Markdown file, Using Knit to output an R Markdown file	2
12	Case Study- Wildfire Activity in the Western United States	3
13	Case Study- Single Family Residential Home and Rental Values	3
14	Case Study/Mini-project	6
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1			
2.0	**Skills**		
2.1	CLO1- To be able to use R Studio for data loading and transformation.	Classroom Teaching and Laboratory practice	Midterm Exam, Quizzes, Final Exam Lab Exercise
2.2	CLO2- To explore the data using bar chart, histogram, boxplot.	Classroom Teaching and Laboratory practice	Lab Exercise
2.3	CLO3- To be able to visualize data using scatterplot.	Classroom Teaching and Laboratory practice	Midterm Exam, Quizzes, Final Exam Lab Exercise
2.4	CLO4- To be able to apply data visualization techniques in case studies	Classroom Teaching and Laboratory practice	Midterm Exam, Quizzes, Final Exam Lab Exercise
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	Week 3	10%
2	Lab Assignment 1	Week 3	10%
3	Mid Term	Week 6	20%
4	Lab Assignment 1	Week 7	10%
5	Quiz 2	Week 8	10%
6	Final Exam	Week 12	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counselling.

- Available for a minimum of 4 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / D2L/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	**Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline. O'Reilly. 2014**
Essential References Materials	**•Jure Leskovek, Anand Rajaraman and Jeffrey Ullman. Mining of Massive Datasets. v2.1, Cambridge University Press. 2014.** **•Kevin P. Murphy. Machine Learning: A Probabilistic Perspective. ISBN 0262018020. 2013** *NINA ZUMEL, JOHN MOUNT, Practical Data Science with R, Manning Publications Co.,2014*
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms, laboratories
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, LCD Projector, 'R' programming Tool, Blackboard
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Direct Review
Course Feedback	Students	Indirect course Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Data Mining
Course Code:	**CS 475**
Program:	Computer Science
Department:	Computer Science
College:	CCIS
Institution:	MAJMAAH UNIVERSITY

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A. Course Identification **3**

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D. Teaching and Assessment **5**

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E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours:	**(3, 1, 0)**
2. Course type	
a.	University [x] College [ ] Department [ ] Others [ ]
b.	Required [x] Elective [ ]
3. Level/year at which this course is offered:	**9**
4. Pre-requisites for this course (if any)**:**	Knowledge of Statistics, Linear Algebra
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	11
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course will introduce data mining and statistical methods for extracting knowledge from data. The principles and theories of data mining methods will be discussed and will be related to the issues in applying data mining to real world problems. Data Mining studies algorithms and computational paradigms that allow computers to find patterns and regularities in databases, perform prediction and forecasting, and generally improve their performance through interaction with data. It is currently regarded as the key element of a more general process called Knowledge Discovery that deals with extracting useful knowledge from raw data. The knowledge discovery process includes data selection, cleaning, coding, using different statistical and machine learning techniques, and visualization of the generated structures. Important related technologies, as data warehousing and on-line analytical processing (OLAP) will be also discussed. This course will utilize data mining techniques on real time data, and best practices as it examines the topics of data preprocessing, data modeling, and discovering knowledge from the data. In this course, Weka and Rapid Miner tools will be used to mine the data.

2. Course Main Objective

The course will provide an overview of understanding data and how to identify the right data mining techniques and formulate data mining tasks in order to solve problems using the data

aided by data mining techniques. The topics of the course will include the key tasks of data mining, including data preparation and visualization, concept description, exploration and discovery, statistical methods, association rule mining, classification and Prediction. Through the exploration of the concepts and techniques of data mining and practical exercises, students will develop skills and hands on experience using data mining software that can be applied to data challenges.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Understand and apply the basic concepts and techniques of Data Mining	K1
1.2	Understand the steps involved in knowledge Discovery in databases to mine the data	K1
1.3		
1...		
2	**Skills :**	
2.1	To gain experience of doing independent study/research	S2
2.2	Able to distinguish between various data mining techniques and perform relevant tasks on various kinds of data	S2
2.3	Able to use data mining software for solving practical problems	S4
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Data Mining, Examples and Applications in Real life, Stages in Data Mining	4
2	Data Collection, Sampling and Preprocessing-Types of Data Sources,	4
3	Statistical Analysis, Missing Values, Outlier Detection and Treatment, Standardizing Data, Categorization	4
4	Sampling, Types of Data Elements, Visual Data Exploration and Exploratory	4
5	Predictive Analytics-Linear Regression, Logistic Regression, Decision Trees,	4
6	Multiclass Classification Techniques, Evaluating Predictive Models	4
7	Neural Networks, Support Vector Machines, Ensemble Methods,	4
8	Descriptive Analytics-Association Rules, Sequence Rules, Segmentation	4
9	Social Network Analytics-Social Network Definitions, Social Network Metrics,	4
10	Probabilistic Relational Neighbor Classifier	4
11	Social Network Learning, Relational Neighbor Classifier,	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Understand and apply the basic concepts and techniques of Data Mining	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
1.2	Understand the steps involved in knowledge Discovery in databases to mine the data	Classroom Teaching	Quiz, Assignment, Mid Exam, Final Exam
…			
2.0	**Skills**		
2.1	To gain experience of doing independent study/research	Classroom Teaching	Assignment, Final Exam, Lab Based Exercises
2.2	Able to distinguish between various data mining techniques and perform relevant tasks on various kinds of data	Classroom Teaching	Assignment, Final Exam, Lab Based exercises
2.3	Able to use data mining software for solving practical problems	Classroom Teaching	Assignment, Final Exam, Lab Based exercises
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	4, 8	10%
2	Mid Term Exam	6	20%
3	Assignment	3, 5, 9	10%
4	Lab Based Exercises	Weekly	
5	Final Exam	12	40%
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counselling
- Available for a minimum of 4 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / D2L/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, 2nd Edition. Pearson, 2018
Essential References Materials	J. Han and M. Kamber (2012) Data mining: concepts and techniques. 3rd Edition Morgan Kaufman.
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom, PC Laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Learning Outcomes Feedback	Students	Survey
Final Exam evaluation	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Selected Topics in Data Science
Course Code:	CS476
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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6. Mode of Instruction (mark all that apply) 3

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D. Teaching and Assessment 5

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E. Student Academic Counseling and Support 6

F. Learning Resources and Facilities 6

1.Learning Resources 7

2. Facilities Required 7

G. Course Quality Evaluation 7

H. Specification Approval Data 7

A. Course Identification

1. Credit hours: 3(3,0,1)
2. Course type **a.** University ☐ College ☐ Department ☐ Others ☒ X **b.** Required ☐ Elective ☒ x
3. Level/year at which this course is offered: Level 12/Year 4
4. Pre-requisites for this course (if any)**: CS 322-Computer Organization**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course aims to develop strong data analytic skills using both theoretical and case-based approach to apply data mining and advanced statistical techniques to real world problems facing the society. The students will learn about the use of various multivariate methods, how to design the study to collect data amenable for such analysis, and the issues involved in acquiring, storing, accessing, analyzing, and visualizing large, heterogeneous and real-time data associated with diverse real-world domains.

2. Course Main Objective

This course aims to review and complement foundation statistical knowledge and to establish the context for a range of methods, used in the analysis of simple and complex systems (including non-linear and multivariate scenarios). The course builds expertise in advanced analytics, data mining and quantitative reasoning that have become essential to meet the complexities of information requirement for decision making. The emphasis is on an intuitive understanding of the principles and a practical ability to apply these to real world data scenarios.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO1- Ability to identify the characteristics of data and compare the data analysis techniques for various applications.	S1
2.2	CLO2- Ability to appreciate the issues involved in acquiring, storing, accessing, analyzing, and visualizing large, heterogeneous, and real-time data associated with diverse real-world domains	S4
2.3	CLO3- Ability to demonstrate and apply the various multivariate methods,	S2
2.4	CLO4- Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration.	S4
2.5	CLO5- Ability to handle large scale analytics projects from various domains	S4
2.6		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Review of elementary data analytics and statistic topics - Types of Data, Statistical Summaries of Data	**8**
2	Exploratory Data Analysis and Data Visualization (using any one: R / Python	**4**

3	Regression Models- Fitting equations to Data and transformations	**4**
4	Simple Regression Models and Regression Diagnostics	**8**
5	Multiple Regression	**8**
6	Collinearity	**4**
7	Modeling Categorical Explanatory Variables	**8**
8	Modeling Time Series	**8**
9	Basic Classification Concepts, Rule Based Classifiers	**4**
10	Applications and Case Studies	**4**
Total		60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			
2.0	**Skills**		
2.1	CLO1- Ability to identify the characteristics of data and compare the data analysis techniques for various applications.	Classroom Teaching	Quiz, Mid Exam, Final Exam, Assignment
2.2	CLO2- Ability to appreciate the issues involved in acquiring, storing, accessing, analyzing, and visualizing large, heterogeneous, and real-time data associated with diverse real-world domains	Classroom Teaching	Quiz, Mid Exam, Final Exam

2.3	CLO3- Ability to demonstrate and apply the various multivariate methods,	Classroom Teaching	Quiz, Mid Exam, Final Exam
Code	**Course Learning Outcomes**	**Teaching Strategies**	**Assessment Methods**
2.4	CLO4- Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration.	Lab Exercises and Demonstration of experiments	Quiz and Homework
2.5	CLO5- Ability to handle large scale analytics projects from various domains	Classroom Teaching	Quiz, Mid Exam, Final Exam, Assignment
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 3, Week 8	10%
2	Assignments	Week 4, Week 9	20%
3	Mid Term Exam	Week 6	20%
4	Homework	Week 10	5%
5	Exercise	Every Week	5%
6	Final Exam	Week 12	40%
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counselling.
- Available for a minimum of 4 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / Blackboard/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• (Suggested): Ronald M. Weiers, Introduction to Business Statistics, 7th Edition, Cengage Publishers, 2010, ISBN: 053845217X • Daniel T. Larose, Discovering Knowledge in Data: An Introduction to Data Mining, 2nd Edition, Wiley, 2014, ISBN: 978-0-470-90874-7
Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Class Room, PC**
Technology Resources (AV, data show, Smart Board, software, etc.)	**LCD Projector, R Statistical Language, Python**
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

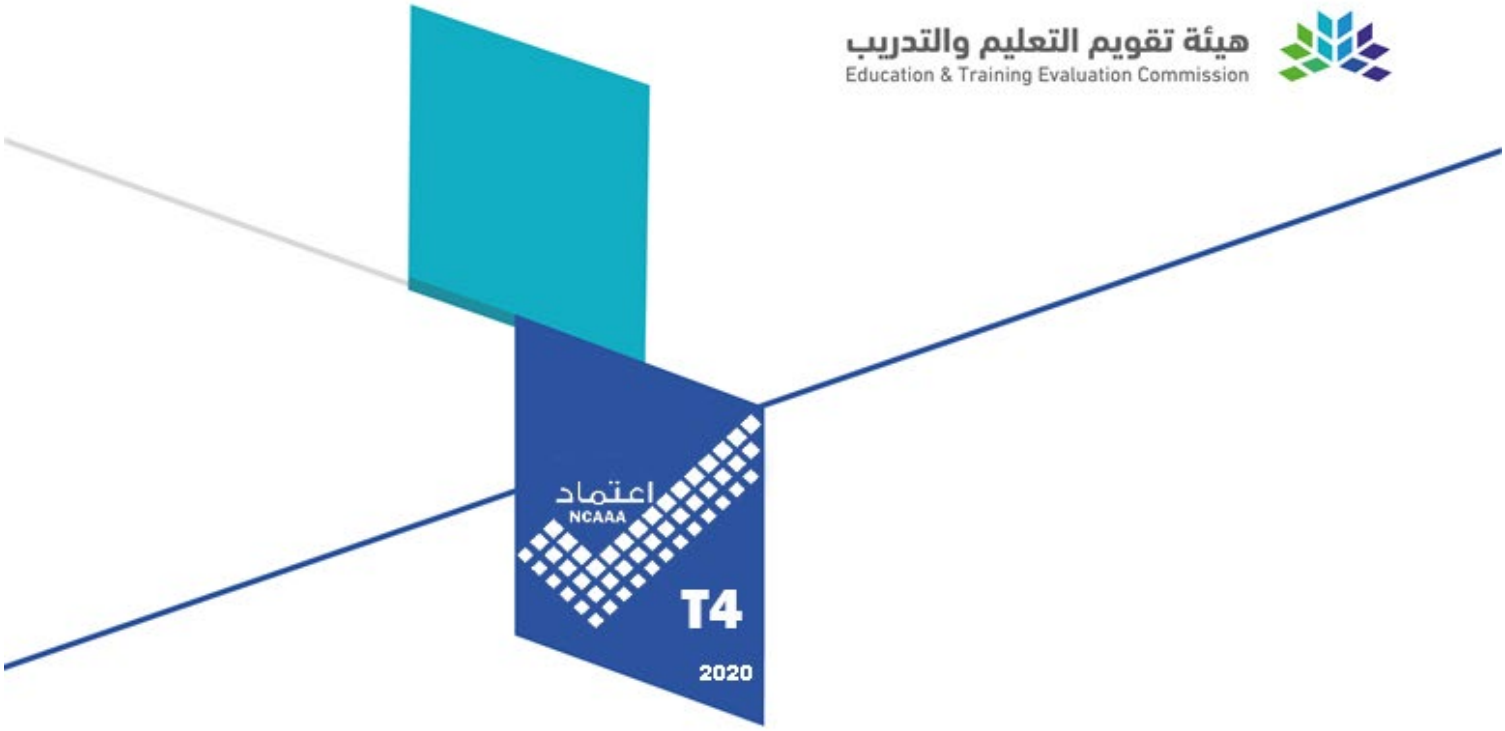
Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Examination, Midterm Exam & Quizzes	Instructor	Direct
Survey	Students	Indirect
Final Examination Marks	Peers	Verification of Marks
Course Report	Quality Unit	Checklist quality reports

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	ENGLISH 1
Course Code:	EN111
Program:	Computer Science- Information Technology
Department:	Computer Science- Information Technology
College:	College of Computer & Information Sciences
Institution:	Majmaah University

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C. Course Content 4

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E. Student Academic Counseling and Support 5

F. Learning Resources and Facilities 5

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation 6

H. Specification Approval Data 6

A. Course Identification

1. Credit hours: **5 (2,6,0)**
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: **L 1**
4. Pre-requisites for this course (if any)**:**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	88	100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22
2	**Laboratory/Studio**	66
3	**Tutorial**	
4	**Others** (specify)	
	Total	88

B. Course Objectives and Learning Outcomes

1. Course Description

The goal of this course is to develop students' proficiency in English. It aims to endorse the four language skills in general and particularly speaking and writing. In addition, students will learn specialist terminology related different technical fields including CS and IT as branches of sciences. This course is intended to provide students of Computer Sciences and IT with more advanced and specialized English needed for studying their major and functioning in their future careers.

2. Course Main Objective

An ability to communicate effectively with a range of audiences

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	communicate with basic technical vocabulary orally and in writing.	S3
2.2	Use properly related technical terms and vocabulary.	S3
2.3	Master grammatical structures related to technical language.	S3
2.4	Read various types of technical texts and charts with reasonable comprehension using a variety of reading skills such as skimming, scanning, and reading for details.	S3
2.5	Write short guided texts using relevant vocabulary, basic sentence structure, reasonably correct spelling, and, punctuation.	S3
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Check-up	8
2	Parts (1)	8
3	Parts (2)	8
4	Movement	8
5	Flow	8
6	Materials	8
7	Specifications	8
8	Reporting	8
9	Troubleshooting	8
10	Safety	8
11	Cause and effect	8
	Total	88

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
…			
2.0	**Skills**		
2.1	communicate with basic technical vocabulary orally and in writing.	Presentation-mini project	Oral tests
2.2	Use properly related technical terms and vocabulary.	lecturing	quizzes
2.3	Master grammatical structures related to technical language.	Lecturing ,lab	Quizzes –exams
2.4	Read various types of technical texts and charts with reasonable comprehension using a variety of reading skills such as skimming, scanning, and reading for details.	**Lecturing , lab**	**Exams, quizzes**
2.5	Write short guided texts using relevant vocabulary, basic sentence structure, reasonably correct spelling, and, punctuation.	lab	Assignment
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	2	5
2	Quiz 2	4	5
3	Oral Test	Every week	5
4	midterm	6	20
5	Final exam	13	40
6	presentation	every week	20
7	assignment	Week 10	5
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

4 office hours/ week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Technical English 1 Second Edition	David Bonamy	Pearson 2008

Essential References Materials	
Electronic Materials	Saudi Digital Library
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom , lab
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

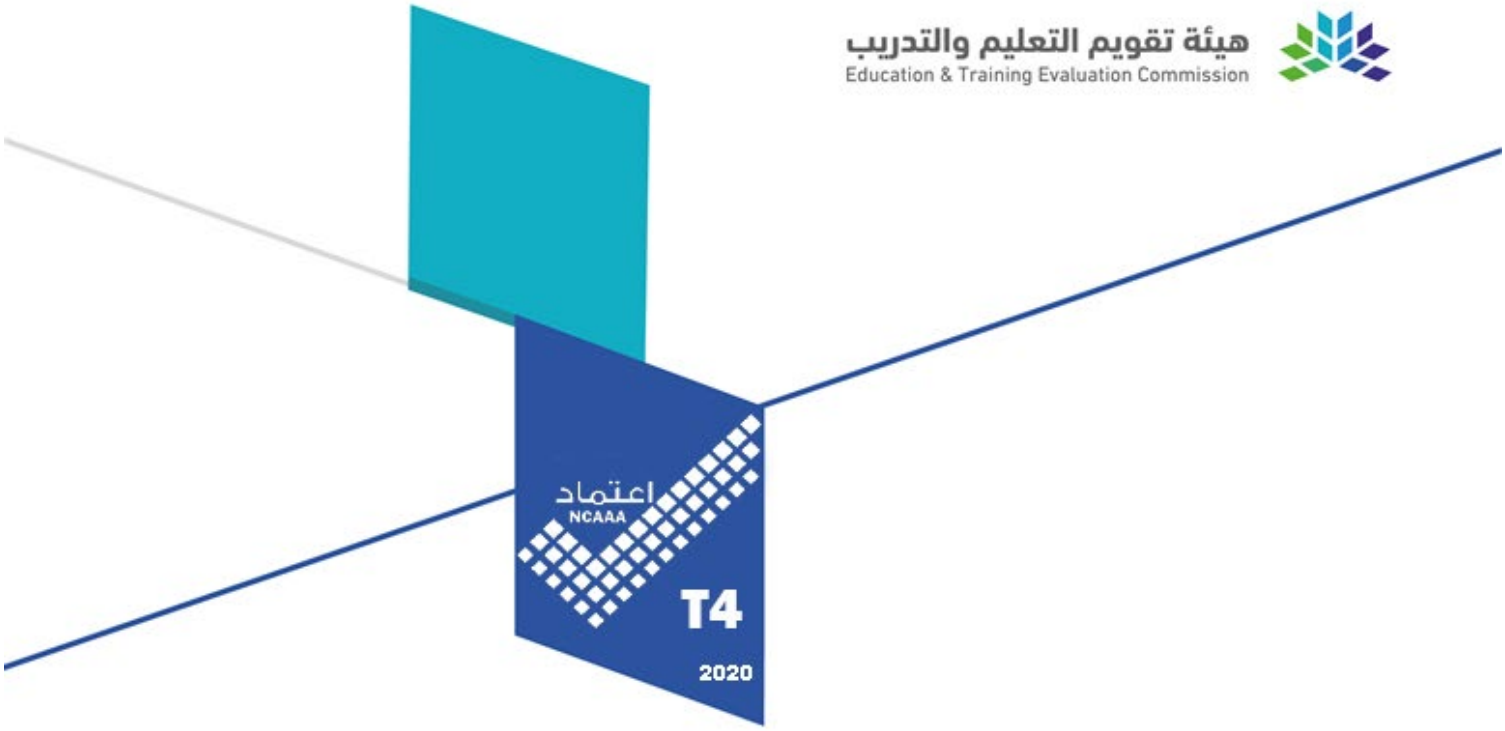
G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Evaluation	Peers	Verification of Marks
Course Report Verification	Quality Coordinator	Check List

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	



Course Specifications

Course Title:	ENGLISH 2
Course Code:	**EN122**
Program:	**Computer Science- Information Technology**
Department:	**Computer Science- Information Technology**
College:	**College of Computer & Information Sciences**
Institution:	**Majmaah University**

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A. Course Identification 3

6. Mode of Instruction (mark all that apply) 3

B. Course Objectives and Learning Outcomes 3

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1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 4

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support 5

F. Learning Resources and Facilities 5

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation 6

H. Specification Approval Data 6

A. Course Identification

1. Credit hours: 3 (1,3,0)
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: L 2
4. Pre-requisites for this course (if any)**: EN 111**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	11
2	**Laboratory/Studio**	33
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course is intended to provide students of Computer Sciences and IT with more advanced and specialized Computing English. The objective is to further endorse students' proficiency in English. It seeks to support language skills and particularly speaking and writing.

2. Course Main Objective

An ability to communicate effectively with a range of audiences

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	

CLOs		Aligned PLOs
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	Use advanced computing vocabulary orally and in writing.	S3
2.2	Learn grammatical structures related to English for computing.	S3
2.3	Read various types of computing English texts and charts .	S3
2.4	Write essays using relevant vocabulary, developed sentence structure, correct spelling, and, punctuation.	S3
2.5		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Everyday uses of computers	4
2	Types of Computers	4
3	Parts of a computer	4
4	Input/output/storage devices	4
5	GUI	4
6	Networks	4
7	Communications	4
8	Databases and Spreadsheets	4
9	Programming	4
10	Languages	4
11	Future trends	4
	Total	44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			
2.0	**Skills**		
2.1	Use advanced computing vocabulary orally and in writing.	Presentation-mini project	Oral tests

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.2	Learn grammatical structures related to English for computing.	Lecturing lab	quizzes
2.3	Read various types of computing English texts and charts	lab	Quizzes –exams
2.4	Write essays using relevant vocabulary, developed sentence structure, correct spelling, and, punctuation	**lab**	Assignment
2.5			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	2	5
2	Quiz 2	4	5
3	Oral Test	Every week	5
4	midterm	6	20
5	Final exam	13	40
6	presentation	every week	20
7	assignment	Week 10	5
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

4 office hours/ week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Eric H Glendinning, John Mc Ewan (2009) *Basic English for Computing (Revised and Updated (Course book),* Oxford.
Essential References Materials	Santiago Remacha Esteras (2008) *Infotech English for Computer Users (Student's book),* Oxford.
Electronic Materials	Saudi Digital Library
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom , lab
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Evaluation	Peers	Verification of Marks
Course Report Verification	Quality Coordinator	Check List

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Technical English 1	
Course Code:	EN212	
Program:	Computer Science- Information Technology	
Department:	Computer Science- Information Technology	
College:	College of Computer and Information Sciences	
Institution:	Majmaah University	

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2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support 6

F. Learning Resources and Facilities 6

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation 6

H. Specification Approval Data 7

A. Course Identification

1. Credit hours:	
2. Course type	
a. University ☐ College ☑ Department ☐ Others ☐	
b. Required ☑ Elective ☐	
3. Level/year at which this course is offered: **Level 4**	
4. Pre-requisites for this course (if any)**:** **EN122**	
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**		
2	**Blended**		
3	**E-learning**	22	100%
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify)	
	Total	

B. Course Objectives and Learning Outcomes

1. Course Description

The course aims to consolidate student's previous knowledge of English, and bring it up to an advanced level which enables them to communicate orally and in writing in a variety of contexts. This course provides students with a solid foundation of basic sentence form and function. It concentrates on grammatical structures, vocabulary expressions often used in technical and professional contexts.

2. Course Main Objective

To enable students to communicate effectively in a variety of contexts.

To enable students to communicate effectively in the domain of technology.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	Comprehend and communicate with technical vocabulary orally and in writing.	S3
2.2	Reinvest major-related technical terms and vocabulary.	S3
2.3	Use grammatical structures related to technical language.	S3
2.4	Read various types of technical texts	S3
2.5	Write essays using relevant vocabulary, basic sentence structure, reasonably correct spelling, and, punctuation.	S3
3.1	values	
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Action	**2**
2	Work	**2**
3	Comparison	**2**
4	Processes	**4**
5	Descriptions	**2**
6	Procedures	2
7	Services	2
8	Energy	2
9	Midterm Exam	2
10	Revision	2
	Total	22

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			
2.0	**Skills**		
2.1	Comprehend and communicate with technical vocabulary orally and in writing.	Oral/written communication, seminar lecture	Presentation Midterm Final exams
2.2	Reinvest major-related technical terms and vocabulary.	Oral/written communication, seminar	Presentation
2.3	Use grammatical structures related to technical language.	Lecture	Quizzes
2.4	Read various types of technical texts	Oral/written communication, seminar lecture	Midterm Final exams
2.5	Write essays using relevant vocabulary, basic sentence structure, reasonably correct spelling, and, punctuation	lecture Oral/written communication, seminar	Midterm final exams Reports
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 4, Week 10	10%
2			
3	Mid Term Exam	Week 6	20%
4	report	Week 10	10%
5	presentation	Every Week	15%
6	Class Participation	Every Week	5%
7	Final Exam	Week 13	40%
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice : Each student is allotted to an academic advisor for guidance and counselling

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	David Bonamy (2008) *Technical English 2 (Course book),* Pearson Longman
Essential References Materials	
Electronic Materials	Blackboard
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Feedback	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Technical English 2	
Course Code:	EN 221	
Program:	Computer Science- Information Technology	
Department:	Computer Science- Information Technology	
College:	College of Computer and Information Sciences	
Institution:	Majmaah University	

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C. Course Content 4

D. Teaching and Assessment 5

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E. Student Academic Counseling and Support 6

F. Learning Resources and Facilities 6

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation 7

H. Specification Approval Data 7

A. Course Identification

1. Credit hours:	**2(2,0)**
2. Course type	
a.	University ☐ College ☑ Department ☐ Others ☐
b.	Required ☑ Elective ☐
3. Level/year at which this course is offered:	**Level 5**
4. Pre-requisites for this course (if any)**:**	**EN212**
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**		
2	**Blended**		
3	**E-learning**	22	100
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify)	
	Total	

B. Course Objectives and Learning Outcomes

1. Course Description

The general goal of this course is to develop students' proficiency in technical English and in the four language skills in general and in speaking and writing in particular. In addition, students will learn specialist terminology related to computer science and IT. Building on the content of Technical English 1, this course is intended to provide students of Computer Sciences and IT with more advanced and specialized technical English needed for studying their major and functioning in their future careers.

2. Course Main Objective

1	To enable students to recognize and communicate with advanced computing terminology effectively in a variety of professional contexts.
2	To enable the students to comprehend technical texts that cover a wide range of topics in their field and use grammatical structures related to technical language.
To write paragraphs and reports using technical language to describe a technical topic.	

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	Comprehend and communicate with advanced computing language.	S3
2.2	Read technical texts that cover topics in the field.	S3
2.3	Use grammatical structures related to technical language.	S3
2.4	Comprehend abbreviations as they relate to computing and information technology.	S3
2.5	Write essays and reports using sequence, fact, description, compare contrast strategies and note taking.	S3
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Computer Users	**2**
2	Computer Architectures	**2**

3	Graphical User Interfaces	**2**
4	Networks	**2**
5	The Internet	**2**
6	The World Wide Web	2
7	Websites	2
8	Software Engineering	2
9	People in Computing	2
10	Recent Developments in IT	2
11	Interview Electronic Publishing	2
	Total	22

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			
2.0	**Skills**		
2.1	Comprehend and communicate with advanced computing language .	Oral/Written Communication, Seminar, lecture	Presentation, Midterm Final exams
2.2	Read technical texts that cover topics in the field.	Oral/Written Communication, Seminar, lecture	Presentation, mini projects
2.3	Use grammatical structures related to technical language.	Oral/Written Communication, Seminar, lecture	Quizzes
2.4	Comprehend abbreviations as they relate to computing and information technology.	Oral/Written Communication, Seminar, lecture	**Quizzes**
2.5	Write paragraphs and reports using sequence, fact, description, compare contrast strategies and note taking.	Oral/Written Communication, Seminar, lecture	Midterm final exams Reports
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 4, Week 11	10%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
2			
3	Mid Term Exam	Week 6	20%
4	report	Week 11	10%
5	presentation	Every Week	15%
6	Class Participation	Every Week	5%
7	Final Exam	Week 12	40%
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Each student is allotted to an academic advisor for guidance and counselling

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	**E. Glendining and J.M c Ewan** (2009) Oxford English for Information Technology *(Course book),* **Oxford**
Essential References Materials	
Electronic Materials	Blackboard
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Feedback	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Engineering Chemistry
Course Code:	GE 313
Program:	Basic Science
Department:	Basic Science
College:	Computer and information Sciences
Institution:	Majmaah University

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2. Course Main Objective 4

3. Course Learning Outcomes 4

C. Course Content **4**

D. Teaching and Assessment **5**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 5

2. Assessment Tasks for Students 6

E. Student Academic Counseling and Support **6**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 7

G. Course Quality Evaluation **7**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours: 3 (3,0,1)
2. Course type **a.** University ☐ College ☒ Department ☐ Others ☐ **b.** Required ☐ Elective ☒
3. Level/year at which this course is offered: Level 7
4. Pre-requisites for this course (if any)**:** Nil
5. Co-requisites for this course (if any)**: Nil**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course is introducing the following topics: Introduction, The study of chemistry, Physical and chemical properties of matter, Atoms, Molecules and Ions, The Atomic theory, The Electronic structure of Atoms, the Photoelectric effect, Bohr's Theory of the Hydrogen Atom, The Dual Nature of the Electron, Quantum Mechanics, Quantum Numbers, Atomic orbitals, Electronic Configuration,Periodic Table, Periodic Classification of the elements, Periodicity of properties, Ionization energy, Chemical Bonding, Electrochemistry, Redox reactions, Chemistry in the Atmosphere.

2. Course Main Objective

This is an introductory course. Students will become proficient in applying their knowledge of Chemistry. The goal of this course is to provide the student with fundamentals and basic chemical engineering concepts which directly related to the engineering sciences. This course is appropriate both as an introductory course for chemistry and other science majors as well as an introductory and terminal course for non-science majors who desire a foundation in chemical principles. The primary learning outcomes are learning the fundamental nature of chemicals and chemical systems and becoming familiar with the language and symbols of chemistry.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1.4		
1.5		
2	**Skills :**	
2.1	Gain knowledge of the basic concepts and principles of Chemistry	S5
2.2	Understand the concepts and principles of Chemistry	S5
2.3	Analyze the Chemical problem and can be able to express it as a chemical equation.	S5
2.4	Apply the basic principles of Chemistry in solving problems in a structured process.	S5
2.5	Able to use necessary techniques and skills in solving chemical problems.	S5
3	**Values:**	
3.1		
3.2		
3.3		
3.4		

C. Course Content

No	List of Topics	Contact Hours
1	**Introduction: The scientific method, classifications of matter, Physical and chemical properties of matter, measurement, Handling Numbers, Dimensional Analysis in solving problems.**	4
2	**The Atomic theory, The structure of Atom, Atomic Number, Mass Number and Isotopes**	4
3	**The Periodic Table, Molecules and Ions, Chemical formulas, Naming Compounds, Introduction to Organic compounds**	4
4	**From Classical Physics to quantum theory, the Photoelectric effect, Bohr's Theory of the Hydrogen Atom**	4

5	**The Dual Nature of the Electron, Quantum Mechanics, Quantum Numbers, Atomic orbitals, Electronic Configuration, The Building-Up Principle**	4
6	**Development of the Periodic table, Periodic Classification of the elements, Periodicity of properties, Ionization energy, Electron affinity.**	4
7	**Lewis Dot Symbols, The Ionic Bond, Lattice Energy of Ionic Compounds**	4
8	**The Covalent bond, Electronegativity, Writing Lewis structures,**	4
9	**Redox reactions, Balancing redox equations,**	4
10	**Earth's Atmosphere, Phenomena in the outer layers of Atmosphere,**	4
11	**,volcanoes, The greenhouse effect, Depletion of ozone in the stratosphere**	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
1.3			
1.4			
1.5			
2.0	**Skills**		
2.1	CLO1-Gain knowledge of the basic concepts and principles of Physics, which is relevant to their further studies.	Classroom Teaching, Laboratory	Quiz, Class test, Mid Exam, Lab exam, Final Exam
2.2	CLO2- Student can understand the concepts and principles of mechanics through lectures and assessment tools.	Classroom Teaching	Assignment, Mid Exam, Final Exam
2.3	CLO3- Student can able to analyze the physical problem and learn to express mathematical equations.	Classroom Teaching	Assignment, Mid Exam, Final Exam
2.4	CLO4- Able to apply basic principles of Physics in solving problems in a structured process.	Classroom Teaching	Quiz, Class test, Mid Exam, Final Exam
3.0	**Values**		
3.1			
3.2			
3.3			
3.4			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	**Homework**	During the term	20%
2	**Midterm**	6th week	20%
3	**Class Test**	8th week	20%
4	**Final Exam**	12th week	40%
5	**Total**		**100%**

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- **Student can access the concern staff during office hours; each student can take the consultation and advice.**
- **Students also contacts through social networking websites/Email for clarification of doubts and consultation.**
- **Available for 2-3 hours in day to the students**

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	**Textbook:** **1. Chemistry, Raymond Chang, 10th. Ed. McGraw - Hill, 2010, ISBN: 978-007-127220-9.** **2. Engineering Chemistry, Extended Edition, Wiley India, ISBN: 9788126536337**
Essential References Materials	**Engineering Chemistry, P.R. Vijayasarathy, 2th. Ed. Eastern Economy.** **Schum's Outline Beginning Chemistry, David E. Goldberg, PhD, McGraw-Hill, 1997.**
Electronic Materials	http://science.pppst.com/chemistry.html http://www.sciencegeek.net/Chemistry/Powerpoints2.shtml http://www.chem1.com/chemed/genchem.shtml http://www.wiredchemist.com/chemistry/instructional/intro_chem_contents.html http://chemwiki.ucdavis.edu/Wikitexts http://www.chem1.com/acad/webtext/virtualtextbook.html http://wiki.chemeddl.org/index.php/Collections:Texts:Chemistry
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Classroom**
Technology Resources (AV, data show, Smart Board, software, etc.)	**Enough facilities are present (Such as projector, Video conferencing machine)**
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Students	Indirect
Effectiveness of assessment	Instructor	Direct
Achievement of CLOs	Instructor	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	CCIS MEETING
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Fundamentals of Database
Course Code:	IS 213
Program:	Computer Science / Information Technology
Department:	Information Systems
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: 3 (3+0+1)	
2. Course type	
a. University ☐ College ☐ Department ☑ Others ☐	
b. Required ☑ Elective ☐	
3. Level/year at which this course is offered: Level-4	
4. Pre-requisites for this course (if any)**:** CS 131	
5. Co-requisites for this course (if any)**:** CS 211	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	44	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	33
2	Laboratory/Studio	
3	Tutorial	11
4	Others (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course includes the following topics:
Database concepts and architecture; data models, database schemes and instances, DBMS and the concept of program-data independence, database languages and interfaces, database models, relational data model and relational algebra, relational model constraints; domains, keys, and integrity constraints, the structured query language (SQL); data definition, queries, update, statements, and views in SQL, database design; functional dependencies, normal forms.

2. Course Main Objective

The main purpose for this course, Understand the basics and concepts of database systems. Design, implement and evaluate a computer-based DB system to meet desired users' needs, use professionally Structured Query Language (SQL) and understand SQL processing

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2	CLO(2) Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles	K2
1.3		
1...		
2	**Skills :**	
2.1		
2.2	CLO(4) Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline	S2
2.3		
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
.1	Database concepts and architecture	4
.2	Data models, database schemes and instances	4
.3	DBMS and the concept of program-data independence	4
.4	Database languages and interfaces	4
.5	Database models, relational data model and relational algebra, relational model constraints	4
.6	Domains, keys, and integrity constraints, Structured query language (SQL); data definition, queries	4
.7	Update, statements	4
.8	DCL Statements, Views in SQL	4
.9	Database design	4
.10	Functional dependencies	4
.11	Normal forms and Examples	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2	CLO(2) Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles	lecture, lab	Class Test, Mid Exam, Final Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
…			
2.0	**Skills**		
2.1			
2.2	CLO(4) Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline	lecture, lab	Group Assignments, Mini Project
…			
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 3, Week 8	20%
2	Assignments	Week 3, Week 9	10%
3	Mid Term Exam	Week 5	20%
4	Tutorial	Every Week	10%
5	Final Exam	Week 12	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Each student is allotted to an academic advisor for guidance and counselling

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Carlos Coronel, Steven Morris, and Peter Rob, Database Principles: Fundamentals, Design, Implementation, and Management, Cengage Learning, 10th edition, 2013.
Essential References Materials	Jeffry D Ulman, Jenifer Widom, a first course in Database Systems, Pearson New International Edition,3rd edition, 2007 Ramakrishnan, Gehrke, Database Management Systems, Mc Graw Hill, 3rd edition, 2002
Electronic Materials	IEEE Computer Society – Participation in Webinars and discussions through blogs
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Feedback	Students	Survey
Achievement of CLOs	Instructor	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

College of Computer and Information Sciences
كلية علوم الحاسب والمعلومات

جامعة المجمعة
Majmaah University

COURSE SYLLABUS

DEPARTMENT OF INFORMATION TECHNOLOGY

FALL 2022

Course Code	Course Title
IS 333	**SOFTWARE PROJECT MANAGEMENT**

Course Credit : 3 (3,0,1)
Pre-requisite : 100 Credits
Instructor : Dr. Badr Almutairi
Department of Information Science
College of Computer and Information Sciences
Majmaah University
Email: b.algoian@mu.edu.sa
Course Time(s) : Sunday 08:00 PM - 10:00 PM, Monday 08:00 PM - 10:00 PM
Location(s) : Section 1883 (Room # 2),
Office Hours : Sunday 10:00 AM - 11:50 AM, Monday 10:00 AM- 10:50 AM, Wednesday 12:00 PM to 2:00 PM, (Staff Room #27)
Final Exam : As per schedule --- (Comprehensive)
Textbook(s) : 1. Kathy Schwalbe, Information Technology Project Management, Revised, International Edition, 7th Edition, Cengage Learning, 2013.

Course Requirements and Grading Policy:

1- Attendance and Participation in class discussion	10%
2- Quizzes (1)	5%
3- Assignment (1)	5%
4- Midterm Examination	20%
5- Project and Exercise with Presentation	20%
6- Final Examination: (as per schedule)	40% (COMPREHENSIVE)
	100%
Total	

Grades:

A+	:	95 to 100 %
A	:	90 to < 95%
B+	:	85 to < 90%
B	:	80 to < 85%
C+	:	75 to < 80%
C	:	70 to < 75%
D+	:	65 to < 70%
D	:	60 to < 65%
F	:	Below 60 %

Tests: **45 %**

- Quiz 1, Quiz 2 : Week,11 5 %
- Midterm Exam : Week 8 20%
- Project and Exercise with Presentation : Week 1 - 11 20 %

Final Examination: **40 %**

Final Exam: As per schedule (COMPREHENSIVE)

Course Description:

This course addresses the main issues related to software project management such as project definition, scope management, planning, organization, resources, scheduling, control, quality, cost estimation, time estimation, and, risk management. Students are also introduced to project management tools such as Work Breakdown Structure, Gantt charts, PERT, and the critical path method. Topics covered also include project management ethics, and effective project manager skills such as people and leadership skills. Students should get exposed to a software package used for this purpose.

Course Learning Outcomes:

a) After successful completion of this course, student will be able to-

1. Understand the need for project management, project life cycle, key elements, project constraints, and skills needed for project manager.
2. Apply the processes, practices, tools and techniques of project management in delivering successful IT projects.
3. Evaluate a project to develop the scope of work, construct WBS, identify the resources required, provide accurate cost estimates, and can use CPM, PERT and GANTT charts to develop project schedule.
4. Understand and use risk management analysis techniques that identify the factors that put a project at risk and to quantify the likely effect of risk on project timescales.
5. Recognize project ethics and perform quality control.

b) ABET Criterion 3 Student Outcomes addressed by the course:

SO(3) Communicate effectively in a variety of professional contexts

SO(4) Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles

SO(5) Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline

Course Outlines:

Course Topics	Book's Chapter	Event Name	Week Due
Introduction to Project Management, project life cycle, key elements, project constraints, and skills needed for project manager, project ethics	Chapter 1		Week 1,2
Project Management and Information Technology Context	Chapter2		Week 3
Project Management Processes	Chapter 3	**Quiz 1**	Week 4
Project Integration Management	Chapter 4		Week 5
Project Scope Management, WBS	Chapter 5	**Assignment**	Week 6,7
MID TERM EXAMINATIONS		**Mid Term**	Week 8
Project Time Management, Gantt Charts, PERT, CPM	Chapter 6		Week 9
Project Cost Management	Chapter 7		Week 10
Project Quality Management	Chapter 8		Week 11
Project Human Resource Management	Chapter 9	**Quiz 2**	Week 11
Project Risk Management, SWOT	Chapter 11		Week 11

Software Packages	Free tools from Internet		Week 11
Review and Discussions			Week 11
FINAL EXAMINATIONS			

Attendance and Participation in Class Discussion 10 %

- Attendance is necessary but not sufficient which means that you must attend mentally as well as physically.
- Regular classroom attendance and regular participation in the class discussion and solving in class problems are essential.
- Successful learning requires good communication between students and instructors.
- This is a Project Management course, covered in 15 weeks, to be successful in this class, you should plan to arrive on time and participate in class discussion, ask questions, make use of the resources available in the library, and complete all homework.
- You should expect to spend several hours a week outside of class time for practice problems, homework, etc.
- Your contribution is to participate in the class activities within the frame work established in the class syllabus.
- You are responsible for your own attendance. If you miss a class, you are responsible for finding the notes and assignments from a classmate.
- If a student is absent for a class due to an acceptable excuse (like death in first family member, accident, hospitalization) or any other strong reason which makes it impossible to attend class, his excuse will be considered under the condition that the student submits the supportive documents within Maximum a Week after his absence.

Homework, Quizzes and Chapter Tests:

- The homework assignments are problems from each section in the textbook.
- Take time to include all the steps when working your homework problems.
- Doing so will organize your thinking and avoid computational errors.
- It will also give you complete step-by-step solutions of the exercises that can be used to study for exams.
- Writing down all the steps and keeping your work organized may also give you a better chance to receive partial credit
- Solution in the exam is the mirror image of your homework.
- NO ACCEPTENCE FOR UNORGANIZED & UNNEAT ASSIGNEMETS.
- Before each class, please complete the homework assigned in the previous class and it is important to study the previous class material to be able to follow and understand the present class.
- Be ready any time for a Quiz as a problem from the Homework.

General Notes:

- PLEASE TURN CELL PHONES OFF DURING CLASS!!! Cell phones, blackberries, iPods, etc. may not be accessed during class.
- The Final Exam will be comprehensive, covering all the material presented in the course
- NO MAKE UP EXAMS (except for what is stated under the “Regulations for Accepting Excuses for Not Attending Exams” section).
- Last day to drop:
- Last day to withdraw without grade penalty:

- Please note fire exit
- The syllabus is subject to change.
- For any questions, please email me through my MU Email.

Regulations for Accepting Excuses for Not Attending Exams:

1. If Student is absent for Final Exam, Midterm Exam or Class Test due to a strong (like death in first family member, Accident, Hospitalization) or any other strong reason which makes impossible to attend Exam will be considered and student should submit the supportive documents to Vice Dean office within Maximum a Week after completion of the Examination.
2. If a Student is absent in Class Test the Instructor take decision to accept or reject the Excuse submitted by the Student.
3. For Midterm Exam, the decision will be taken by the Vice-Dean for Academic Affair.
4. For Final Exam College Council approval is required.

Learning Environment: MU is a place for learning and growing. You should feel safe and comfortable anywhere on campus. To meet this objective, you should:

1. let your Instructor, Vice-Dean or Dean know if any unsafe, unwelcome or uncomfortable situation arises that interferes with the learning process;
2. inform the instructor within the first two weeks of classes if you have special needs that may affect your performance in this course.

Academic Dishonesty: When College officials award credit, degrees, and certificates, they must assume the absolute integrity of the work you have done; therefore, it is important that you maintain the highest standard of honor in your scholastic work. The College does not tolerate academic dishonesty. Students who are not honest in their academic work will face disciplinary action along with any grade penalty the instructor imposes. Procedures for disciplinary measures and appeals are outlined in the Student Handbook. In extreme cases, academic dishonesty may result in dismissal from the College. Academic dishonesty, in general, involves one of the following acts:

1. Cheating on an examination or quiz, including the giving, receiving, or soliciting of information and the unauthorized use of notes or other materials during the examination or quiz.
2. Buying, selling, stealing, or soliciting any material purported to be the unreleased contents of a forthcoming examination, or the use of such material.
3. Substituting for another person during an examination or allowing another person to take your place.
4. Plagiarizing means taking credits for another person's work or ideas. This includes copying another person's work either word for word or in a substance without acknowledging the source.
5. Accepting help from or giving help to another person to complete an assignment, unless the instructor has approved such collaboration in advance.
6. Knowingly furnishing false information to the college; forgery and alteration or use of College documents or instruments of identification with the intent to defraud.

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Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Computer Fundamentals**
Course Code:	**IT 112**
Program:	**Computer Science/ Information Technology**
Department:	**Information Technology**
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

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F. Learning Resources and Facilities **5**

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: 3(4,1,0)
2. Course type **a.** University ☐ College ☒ Department ☐ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: Level 1
4. Pre-requisites for this course (if any)**: NA**
5. Co-requisites for this course (if any)**: NA**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	55	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	**44**
2	**Laboratory/Studio**	**11**
3	**Tutorial**	
4	**Others** (specify)	
	Total	**55**

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces the overview of the fundamentals of computers. Course coverage will include both theoretical and practical understanding of computer fundamentals. The course will teach all kinds of computing devices (like PCs and Macs, tablets, and phones) as well as how to configure and troubleshoot issues related to network or internet. It will teach, how to work with applications and files. Students will also learn about security, safety, and preventative maintenance, along with basics of databases and programming skills.

2. Course Main Objective

1. Identify and understand the basic computer components.
2. Understand various operating systems, virtualization, data storage, and sharing.
3. Understand setup, software installation and configuration and troubleshooting devices.
4. Learn how to work with applications and files.
5. Learn to connect to networks and the Internet.
6. Identify security issues affecting the use of computers and networks.

7. Understand some principles of software and database development.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO1: Identify and understand the basic computer components.	K1
1.2	CLO5: Understand some principles of software and database development.	K1
1.3		
1.4		
2	**Skills :**	
2.1	CLO2: Understand setup, software installation and configuration, security, and basic troubleshooting.	S2
2.2	CLO3: Learn to connect to networks and the Internet	S2
2.3	CLO4: Identify security issues affecting the use of computers and networks.	S2
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Common computing devices, using a workstation	4
2	Use and manage an OS, system troubleshooting	6
3	System components, using device interfaces, peripheral devices	6
4	Storage devices, file systems	4
5	Connecting to a network, secure web browsing	6
6	Shared storage and mobile devices	4
7	Application and databases: Data types, using applications	8
8	Application development and databases	7
9	Systems Security, securing devices,	4
10	Access control systems	3
11	Security policies and procedures	3
Total		55

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	CLO1: Identify and understand the basic computer components.	Classroom Teaching	Midterm Exam, Quizzes, Final Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2	CLO5: Understand some principles of software and database development.	Classroom Teaching and Laboratory practice	Midterm Exam, Quizzes, Final Exam
…			
2.0	**Skills**		
2.1	CLO2: Understand setup, software installation and configuration, security, and basic troubleshooting.	Classroom Teaching and Laboratory practice	Lab Exercise
2.2	CLO3: Learn to connect to networks and the Internet	Classroom Teaching and Laboratory practice	Lab Exercise
2.3	CLO4: Identify security issues affecting the use of computers and networks.	Classroom Teaching and Laboratory practice	Midterm Exam, Quizzes, Final Exam, Assignments
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	Week 3	10%
2	Assignment 1	Week 3	10%
3	Midterm	Week 6	20%
4	Assignment 2	Week 7	10%
5	Quiz 2	Week 9	10%
6	Final Exam	Week 12	40%
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Students can meet the faculty during advising hours or whenever the faculty is in the office.

Office Hours: 4 Hours/Week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	CompTIA IT Fundamentals+ FC0-U61 Cert Guide (Certification Guide) 1st Edition. ISBN-13: 978-0789760418

Essential References Materials	
Electronic Materials	Saudi Digital Library
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Laboratory- Capacity for 20 students to be seated.
Technology Resources (AV, data show, Smart Board, software, etc.)	PC - Smart board - Computers in the Lab room
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Evaluation	Peers	Verification of Marks
Course Report Verification	Quality Coordinator	Check List

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Selected Topics in Emerging Technologies
Course Code:	IT 232
Program:	IT
Department:	IT
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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D. Teaching and Assessment **5**

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2. Assessment Tasks for Students 6

E. Student Academic Counseling and Support **6**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 7

G. Course Quality Evaluation **7**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours: 2(0,4,0)
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: **Level 6**
4. Pre-requisites for this course (if any)**:** **……..**
5. Co-requisites for this course (if any)**:NIL**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	**44**	**100%**
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	
2	**Laboratory/Studio**	**44**
3	**Tutorial**	
4	**Others** (specify)	
	Total	**44**

B. Course Objectives and Learning Outcomes

1. Course Description Technological advancements today enable faster changes and progress, accelerating the pace of change. In the contactless world tomorrow, IT professionals' roles will change significantly not only because of technology trends and emerging technologies, which has caused a great deal of change in the IT sector. The IT professional will be constantly learning, unlearning, and relearning .Topics include Machine Learning and Artificial Intelligence, IoT & Edge Computing, Virtual Reality , Augmented Reality and Block chain.
2. Course Main Objective Understand and Analyze technological advancements in Machine Learning and Artificial Intelligence, IoT &Edge Computing, Virtual Reality and Augmented Reality and Block chain.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO 1- Discover how technology is evolving and will continue to evolve.	K1
1.2	CLO 5. Understand the operational processes of IoT ,Edge Computing, Virtual Reality ,Augmented Reality and Block chain	K1
2	**Skills :**	
2.1	CLO 2 Identify and analyze user needs and implement ML and AI concept for effective cyber defenses and security.	S4
2.2	CLO 3. Know and apply the methodology of security using Block chain targeted attacks.	S5
3	**Values:**	
3.1	CLO4. Analyze and find the effect of IoT, Edge Computing, Blockchain and Virtual Reality in present era.	V2
3.2		
3.3		

C. Course Content

No.	Topics	Weeks	Teaching hours
1	**Machine Learning &Artificial Intelligence** Machine learning Data Analytics Pattern recognition Neural Network and Deep learning	3	10
2	**IoT and Edge Computing** IoT history and potential IoT and Smart City IoT architecture Edge Computing	3	10
3	**Virtual Reality and Augmented Reality** Virtual Reality	2	8

	Augmented Reality Cross platform theory VR toolkit Applications		
4	**Blockchain** Terminology and Technical Foundations Why the Blockchain Is Needed How the Blockchain Works Planning the blockchain Cyber security using Blockchain Limitations	2	8
	Total	**11**	**44**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	CLO 1- Discover how technology is evolving and will continue to evolve.	Classroom Teaching	Test, Mid Exam, Final Exam
1.2	CLO 5. Understand the operational processes of IoT ,Edge Computing, Virtual Reality ,Augmented Reality and Block chain	Classroom Teaching	Test, Mid Exam, Final Exam
1.3			
2.0	**Skills**		
2.1	CLO 2 Identify and analyze user needs and implement ML and AI concept for effective cyber defenses and security.	Classroom & Exercise Teaching	Mini Project, Lab Based Assignments, Lab Test
2.2	CLO 3. Know and apply the methodology of security using Block chain targeted attacks	Classroom & Exercise Teaching	Mini Project, Lab Based Assignments, Lab Test
…			
3.0	**Values**		
3.1	CLO4. Analyze and find the effect of IoT, Edge Computing, Blockchain and Virtual Reality in present era.	Classroom Teaching, Project	Class Test, Mid Exam, Final Exam
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Tes/Quiz t(1,2)		10%
2	Mid Term Exam		20%
3	Lab Exam		10%
4	Lab Based Assignments/ Mini Project Presentation		20%
5	Final Exam		40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Each student is allotted to an academic advisor for guidance and counselling

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	**Machine Learning: The New AI (MIT Press Essential Knowledge series)** • ISBN-10 : 0262529513 • ISBN-13 : 978-0262529518 **IoT and Edge Computing for Architects: Implementing edge and IoT systems from sensors to clouds with communication systems, analytics, and security, 2nd Edition** • ISBN-10 : 1839214805 • ISBN-13 : 978-1839214806 **Creating Augmented and Virtual Realities: Theory and Practice for Next-Generation Spatial Computing 1st Edición** • ISBN-10 : 1492044199 • ISBN-13 : 978-1492044192 **The Blockchain and the New Architecture of Trust** Kevin Werbach • **ISBN:9780262038935** • **Published: November 20, 2018**
Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

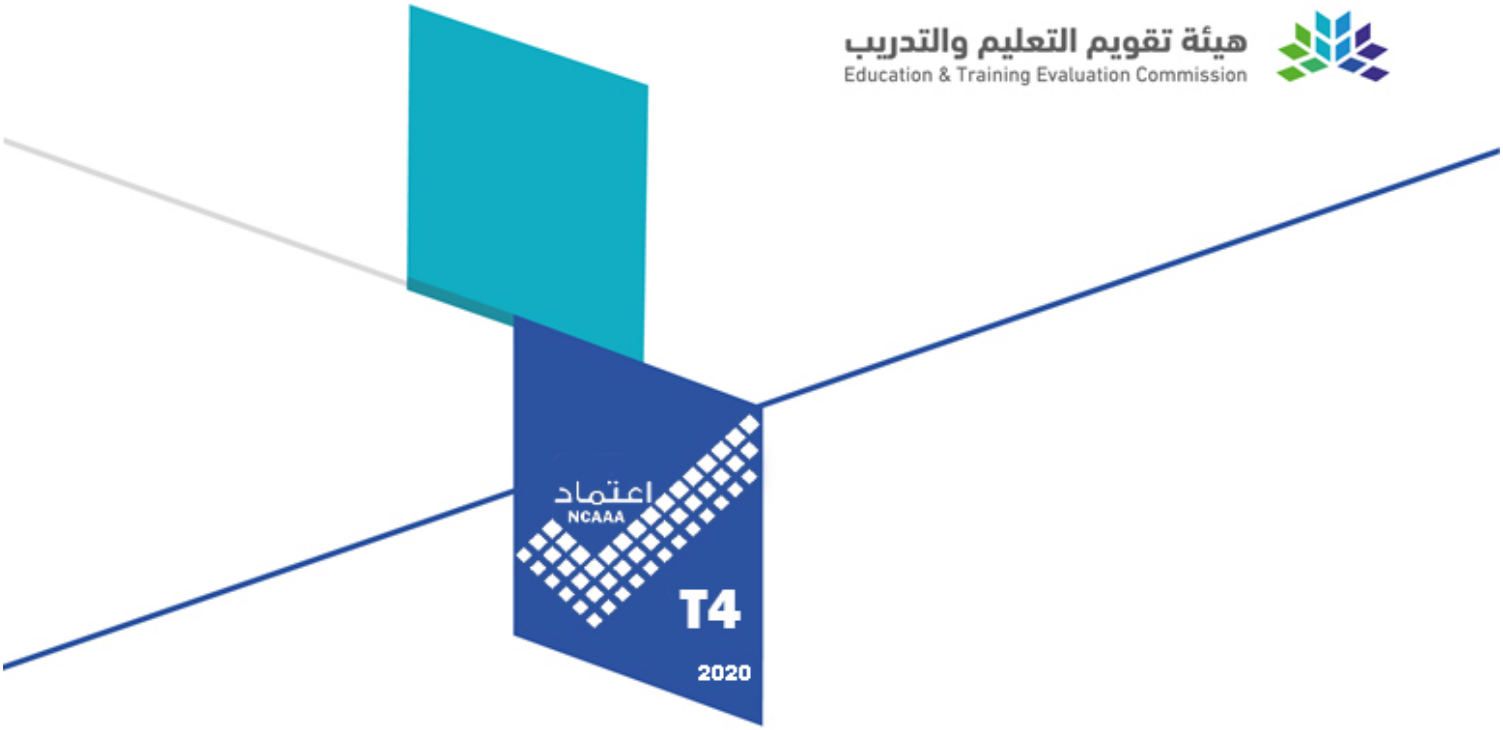
Evaluation Areas/Issues	Evaluators	Evaluation Methods
Test/Quiz/Mid Term/ Final Exam assessment (Extent of achievement of course learning outcomes)	Course instructor	Direct
Course Survey in the middle of the semester and at the end of the semester (Effectiveness of teaching and assessment)	Students	Indirect
Extent of achievement of course learning outcomes	Students	Indirect
Final Exam Answer Scripts Verification	Peer faculty members	Review (Direct)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Data Transmission and Computer Networks
Course Code:	IT 321
Program:	Information Technology & Computer Science
Department:	Information Technology
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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E. Student Academic Counseling and Support 6

F. Learning Resources and Facilities 6

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation 6

H. Specification Approval Data 7

A. Course Identification

1. Credit hours:	**3 (3,0,1)**
2. Course type	
a.	University ☐ College ☒ Department ☐ Others ☐
b.	Required ☒ Elective ☐
3. Level/year at which this course is offered:	Level 8
4. Pre-requisites for this course (if any)**: CS240-Operating System**	
5. Co-requisites for this course (if any)**: NIL**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

In this course students will develop a deeper understanding of modern compiler techniques applied to general purpose programming languages. It will give students a working knowledge of the foundations, tools, and engineering approaches used in developing formal language translators.

2. Course Main Objective

This course aims to provide a theoretical as well as experimental background of Computer Network with a focus on the following:

Introduction to computer networks, Network architecture, OSI reference model, Transmission media, Transmission Impairments, Data encoding; Data Link: Error Detection, Medium Access control Protocols and standards, MAC Addressing, Link layer Switches, LAN standards & Devices: Ethernet and IEEE standards for LANs,

Wireless networks; Network Layer: Virtual circuit and Datagram Networks, Router Structure, The Internet Protocol (IP), Routing Algorithms, Broadcasting and Multicasting; Transport Layer: TCP and UDP services, designs, and performance, Principles of Reliable Data Transfer; Application layer: The Web and HTTP, FTP, Electronic Mail, and DNS.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO1: Understand and analyze the structure of an abstract layered protocol model (OSI, TCP/IP) and Transmission Media	S1,
2.2	CLO2: Understand and implement data link (DL) layer protocols	S1
2.3	CLO4: Understand and implement the principles of Delivery, Forwarding, and Routing	S3
2...		
3	**Values:**	
3.1	CLO3: Understand the principles of Network Layer Services	V1
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to computer networks, Network architecture, OSI reference model	3
2	Transmission media, Transmission Impairments	3
3	Data encoding; Data Link: Error Detection	3
4	Medium Access control Protocols and standards ,MAC Addressing	3
5	Link layer Switches, LAN standards & Devices, Ethernet and IEEE standards for LANs	3
6	Network Layer: Virtual circuit and Datagram Networks	3
7	Router Structure, The Internet Protocol (IP), Routing Algorithms Broadcasting and Multicasting	3
8	Transport Layer: TCP and UDP services	3
9	Designs, and performance of TCP, Principles of Reliable Data Transfer	3
10	Application layer Protocol: The Web and HTTP	3
11	FTP, Electronic Mail, and DNS Protocol	3
Total		33

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Students will learn, understand and explain the main techniques and algorithms used in compilers.	Lectures, Discussions	Exams, Assignments, Participation
1.2			
…			
2.0	**Skills**		
2.1	CLO1: Understand and analyze the structure of an abstract layered protocol model (OSI, TCP/IP) and Transmission Media	Classroom Teaching	Class Test, Mid Exam, Final Exam
2.2	CLO2: Understand and implement data link (DL) layer protocols	Classroom Teaching	Class Test, Mid Exam, Final Exam
2.3	CLO4: Understand and implement the principles of Delivery, Forwarding, and Routing	Oral /Written Communication, Seminar	Group Assignments, Mini Project
2.4	CLO5: Understand principles of Transport Layer Services & design principles of Transport Protocols (UDP & TCP) and application layer services	Classroom Teaching Mini Project, Lab Exercises	Class Test, Mid Exam, Final Exam Lab based Assignments, Mini Project
3.0	**Values**		
3.1	CLO3: Understand the principles of Network Layer Services	Mini Project, Graduation Project, Lab Exercises	Oral or Written Communication, Seminar
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	**Midterm Examination:**	**Week 6**	**20%**
2	**Final Examination**	**Week 11**	**40%**
3	**Quiz**	**All Weeks**	**15%**
4	**Exercises / Assignments / Homework:**	**All Weeks**	**15%**
5	**Lab based Assignments**	**All Weeks**	**5%**
7	**Attendance / Participation**	**All Weeks**	**5%**
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice : Every faculty will be assigned 10 students in the corresponding department for academic advising. Students can meet the faculty during advising hours or whenever the faculty is in the office.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	**Data Communications, Networking, 5th Edition, Behrouz, Forouzan, McGraw-Hill 2012**
Essential References Materials	Tanenbaum, Computer Networks, 5th Edition, Prentice Hall, 2010. James F. Kurose, and Keith W Ross, Computer Networking: A Top-Down Approach, Addison-Wesley, 2012. Larry Patterson and Bruce Davis, Computer Networks: A systems Approach, Morgan Kaufmann, 2011.
Electronic Materials	• http://www.sdl.edu.sa • http://lms.mu.edu.sa
Other Learning Materials	CISCO Packet tracer

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Class Room. Lab.
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Feedback	Students	Survey

Evaluation Areas/Issues	Evaluators	Evaluation Methods

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Science Department
Reference No.	
Date	

College of Computer and Information Sciences
كلية علوم الحاسب والمعلومات

جامعة المجمعة
Majmaah University

COURSE SYLLABUS

DEPARTMENT OF COMPUTER SCIENCE

SPRING 2022

Course Code	Course Title
IT332	Ethics & Professional Practice

Course Credit : 2 (2,0,0)
Pre-requisite :
Instructor : Dr. Badr Almutairi
Computer Science Department
College of Computer and Information Sciences
Majmaah University
Email: b.algoian@mu.edu.sa
Course Time(s) : Tue 10:00 AM- 11:50 AM
Location(s) : Room 6
Office Hours : Tue 11:45 AM- 12:10 PM,

Final Exam : As per schedule --- (Comprehensive)
Textbook(s) : Joseph M. Kizza: "Ethical and social issues in Information Age" 5th Edition Springer 2013.

Course Requirements and Grading Policy:

1-	Attendance and Participation in class discussion	10%
2-	Assignments	20%
3-	Midterm Examination: Week # 8	20%
4-	In Class Test: Week # 11	10%
5-	Final Examination: (as per schedule)	40% (COMPREHENSIVE)
	Total	**100%**

Grades:

A+	:	95 to 100 %
A	:	90 to < 95%
B+	:	85 to < 90%
B	:	80 to < 85%
C+	:	75 to < 80%
C	:	70 to < 75%
D+	:	65 to < 70%
D	:	60 to < 65%

F : Below 60 %

Tests: 30 %

- Midterm Exam	:	Week 8	20%
- In-class test / Exercise / Lab	:	Week 11	10%

Final Examination: 40 %

Final Exam: As per schedule (COMPREHENSIVE)

Course Description:

This course will develop the ethical foundations of good professional practice in information technology. It will provide the necessary background of ethical theories and practices, and discuss the role of professional organizations in maintaining such practice, specifically in the information technology industry. Also, It considers legislation that applies in the information technology industry, including major areas of ethical related in information technology, such as, software ownership, data privacy, and computer cracking

Course Learning Outcomes:

1. Understand ethical theories: authoritarian, intuitionist, egoist, utilitarian, and deontologist.
2. Understand origin and purpose of professions, internal regulation versus external regulation, dimensions of professional responsibility, professional organizations: ethics and codes of conduct.
3. Recognize computer hacking, computer cracking, and difficulties with traditional legal concepts.
4. Understand the meaning of privacy, computer data and human dignity, the problematic status of information stored on computers.
5. Understand the Theories of property and ownership: Patent, Copyright, and trade secrets, and Ownership of computer software

Course Outlines:

Week	Course Topics	Book's Chapter	Event Name	Week Due
1	Morality and the Law	Chapter 2 Textbook		
2	Ethics and Ethical Analysis	Chapter 3 Textbook		
3	Ethics and Professions	Chapter 4		

		Textbook		
4	Ethics and Professions	Chapter 4 Textbook		
5	Anonymity	Chapter 5 Textbook	Assignment	
6	Security and Privacy	Chapter 5 Textbook		
7	Intellectual Property Rights and Computer Technology	Chapter 6 Textbook		
8	**Midterm Exam**			
9	Computer Crimes	Chapter 9 Textbook		
10	Ethics in Cyperspace	Chapter 12 Textbook		
11	Ethics in Cyperspace	Chapter 12 Textbook		
12	Ethical, Privacy, and Security Issues in the Online Social Network Ecosystems	Chapter 13 Textbook	Quiz/test Assignment	
13	Mobile Systems and Their Intractable Social, Ethical and Security Issues	Chapter 14 Textbook		
14	Review Week			
15	Review Week			
16	**FINAL EXAMS**			

Attendance and Participation in Class Discussion:

- Attendance is necessary but not sufficient which means that you must attend mentally as well as physically.
- Regular classroom attendance and regular participation in the class discussion and solving in class problems are essential.
- Successful learning requires good communication between students and instructors.
- This is a Course Name course, covered in 15 weeks, to be successful in this class, you should plan to arrive on time and participate in class discussion, ask questions, make use of the resources available in the library, and complete all homework.
- You should expect to spend several hours a week outside of class time for practice problems, homework, etc.
- Your contribution is to participate in the class activities within the frame work established in the class syllabus.
- You are responsible for your own attendance. If you miss a class, you are responsible for finding the notes and assignments from a classmate.
- If a student is absent for a class due to an acceptable excuse (like death in first family member, accident, hospitalization) or any other strong reason which makes it impossible to attend class, his excuse will be considered under the condition that the

student submits the supportive documents within Maximum a Week after his absence.

Homework, Quizzes and Chapter Tests:

- The homework assignments are problems from each section in the text book.
- Take time to include all the steps when working your homework problems.
- Doing so will organize your thinking and avoid computational errors.
- It will also give you complete step-by-step solutions of the exercises that can be used to study for exams.
- Writing down all the steps and keeping your work organized may also give you a better chance to receive partial credit
- Solution in the exam is the mirror image of your homework.
- NO ACCEPTENCE FOR UNORGANIZED & UNNEAT ASSIGNEMETS.
- Before each class, please complete the homework assigned in the previous class and it is important to study the previous class material to be able to follow and understand the present class.
- Be ready any time for a Quiz as a problem from the Homework.

General Notes:

- PLEASE TURN CELL PHONES OFF DURING CLASS!!! Cell phones, blackberries, iPods, etc. may not be accessed during class.
- The Final Exam will be comprehensive, covering all the material presented in the course
- NO MAKE UP EXAMS (except for what is stated under the "Regulations for Accepting Excuses for Not Attending Exams" section).
- Last day to drop: **()**
- Last day to withdraw without grade penalty: **()**
- Please note fire exits.
- The syllabus is subject to change.
- For any questions, please email me through my MU Email.

Regulations for Accepting Excuses for Not Attending Exams:

1. If Student is absent for Final Exam, Midterm Exam or Class Test due to a strong (like death in first family member, Accident, Hospitalization) or any other strong reason which makes impossible to attend Exam will be considered and student should submit the supportive documents to Vice Dean office within Maximum a Week after completion of the Examination.
2. If a Student is absent in Class Test the Instructor take decision to accept or reject the Excuse submitted by the Student.
3. For Midterm Exam, the decision will be taken by the Vice-Dean for Academic Affair.
4. For Final Exam College Council approval is required.

Learning Environment: MU is a place for learning and growing. You should feel safe and comfortable anywhere on campus. To meet this objective, you should:

1. let your Instructor, Vice-Dean or Dean know if any unsafe, unwelcome or uncomfortable situation arises that interferes with the learning process;
2. inform the instructor within the first two weeks of classes if you have special needs that may affect your performance in this course.

Academic Dishonesty: When College officials award credit, degrees, and certificates, they must assume the absolute integrity of the work you have done; therefore, it is important that you maintain the highest standard of honor in your scholastic work. The College does not tolerate academic dishonesty. Students who are not honest in their academic work will face disciplinary action along with any grade penalty the instructor imposes. Procedures for disciplinary measures and appeals are outlined in the Student Handbook. In extreme cases, academic dishonesty may result in dismissal from the College. Academic dishonesty, in general, involves one of the following acts:

1. Cheating on an examination or quiz, including the giving, receiving, or soliciting of information and the unauthorized use of notes or other materials during the examination or quiz.
2. Buying, selling, stealing, or soliciting any material purported to be the unreleased contents of a forthcoming examination, or the use of such material.
3. Substituting for another person during an examination or allowing another person to take your place.
4. Plagiarizing means taking credits for another person's work or ideas. This includes copying another person's work either word for word or in a substance without acknowledging the source.
5. Accepting help from or giving help to another person to complete an assignment, unless the instructor has approved such collaboration in advance.
6. Knowingly furnishing false information to the college; forgery and alteration or use of College documents or instruments of identification with the intent to defraud.

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Information Security
Course Code:	IT 422
Program:	Information Technology
Department:	Information Technology
College:	Colleague of Computer and Information Sciences
Institution:	Majmaah University

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6. Mode of Instruction (mark all that apply) 3

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C. Course Content **4**

D. Teaching and Assessment **4**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 4

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: **3(3,0,1)**
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: Level 8/ Fourth year
4. Pre-requisites for this course (if any)**:** IT 341: Data Transmission and Computer Networks
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	**44**	**100%**
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	**29**
2	**Laboratory/Studio**	
3	**Tutorial**	**15**
4	**Others** (specify)	
	Total	**44**

B. Course Objectives and Learning Outcomes

1. Course Description

The topics related to this course are listed in the section: course content.

2. Course Main Objective

This course addresses aspects of information security. Topics include objectives of information security systems, Components of an Information System, The Security Systems Development Life Cycle, types of threats and attacks, Ethics and Information Security, overview of Risk Management, Risk Identification, Risk Assessment, Risk Control Strategies, Security Technology: Firewalls and VPNs, Intrusion Detection and Prevention Systems, and Other Security Tools , Cryptography, Cryptographic Tools, Protocols for Secure Communications, Attacks on Cryptosystems, Physical Security, and other security issues.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO2: Aware of the important of security, policies and procedures and knowledge of Computer Forensic	K1
1.2	CLO3: Aware of the security threats and how to mitigate them	K1
1.3	CLO5: Understand the different types of cryptography and its applications	K1
2	**Skills :**	
2.1	CLO1: Design, implement security solutions to protect information	S2
2.2	CLO4: Be able to design secure network	S1
2.3		
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Information Security	4
2	Threats and attacks	4
3	Risk management	4
4	Security planning	4
5	Network Security I	4
6	Network Security II	4
7	Scanning and Analysis Tools	8
8	Cryptology	4
9	Physical security	4
10	Security and Personal	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.1	CLO2: Aware of the important of security, policies and procedures and knowledge of Computer Forensic	Classroom Teaching	Test, Mid Exam, Final Exam
1.2	CLO3: Aware of the security threats and how to mitigate them	Classroom Teaching	Test, Mid Exam, Final Exam
1.3	CLO5: Understand the different types of cryptography and its applications	Classroom Teaching	Test, Mid Exam, Final Exam
2.0	**Skills**		
2.1	CLO1: Design, implement security solutions to protect information	Lab based assiognment/Project& Exercise Teaching	Lab Based Assignments, Lab Test, Mid Exam, Final Exam, Mini Project.
2.2	CLO4: Be able to design secure network	Classroom & Exercise Teaching	Lab Based Assignments, Lab Test, Mid Exam, Final Exam, Mini Project.
…			
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Tests(2)	Week 4, Week 12	10%
2	Mid Term Exam	Week 8	20%
3	Exercise	Every Week	10%
4	Lab Based Assignments/ Mini Project Presentation	Week 8,week 14	20%
5	Final Exam	Week 16	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Each student is allotted to an academic advisor for guidance and counselling

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Principles of Information Security, Michael E. Whitman and Herbert J. Mattord, 5th ed., Thomson/Cengage Learning, 2016
Essential References Materials	
Electronic Materials	Web References and downloads: http://lms.mu.edu.sa
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Test/Quiz/Mid Term/ Final Exam assessment (Extent of achievement of course learning outcomes)	Course instructor	Direct
Course Survey in the middle of the semester and at the end of the semester (Effectiveness of teaching and assessment)	Students	Indirect
Extent of achievement of course learning outcomes	Students	Indirect
Final Exam Answer Scripts Verification	Peer faculty members	Review (Direct)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	

Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Calculus 1**
Course Code:	**MH 113**
Program:	**Basic Science**
Department:	**Computer Science**
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

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F. Learning Resources and Facilities **6**

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G. Course Quality Evaluation **7**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours:
2. Course type **a.** University ☐ College ☒ Department ☐ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: Level 1
4. Pre-requisites for this course (if any)**:** **N/A**
5. Co-requisites for this course (if any)**:** **N/A**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify) Exercises	11
	Total	

B. Course Objectives and Learning Outcomes

1. Course Description

1) Limits and Continuity: The Concept of Limit, Computation of Limits, Continuity and its Consequences, Limits Involving Infinity, Asymptotes.

2) The Derivative: Tangent Lines and Velocity, The Derivative, Computation of Derivatives: The Power Rule, Higher Order Derivatives, The Product and Quotient Rules, Chain rule. Derivatives of trigonometric and inverse trigonometric functions. Exponential, logarithmic. Implicit differentiation and inverse function's derivative. Derivatives of high order.

3) Applications of the Derivative: Linear approximation. Hospital's Rule and undetermined forms. Absolute and local extreme, critical points, tests for local extreme, concavity and inflection points, and applications. Rolle's Theorem and the Mean Value Theorem. Curve sketching using calculus. Optimization problems.

4) Integrals: Anti-derivatives, Indefinite Integral; Integration by Substitution; Integration by Parts; Riemann sums; The Definite Integral; Area under curves; The Fundamental Theorems of Calculus; The Mean Value Theorem of Integration.

2. Course Main Objective

a) This course aims at giving student knowledge in fields:
b) Give the intuitive knowledge of limits and continuity of a function.
c) Study the fundamental concepts of differential calculus.
d) Study the applications of derivatives to solve a variety of problems.
e) Study the fundamental concepts of integral calculus
f) Develop students' skills in problem solving.
g) Pursue the later courses of the mathematics

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO-1:Find a limit (numerically, graphically and analytically).	S5
2.2	CLO-4:Find and interpret the integrals of elementary functions.	S5
2.3	CLO-2:Calculate derivatives of complicated functions.	S5
2.4	CLO-5:Pursue later courses in calculus.	S5
2.5	CLO-3:Apply differentiation to problems such as related rates, graphing and optimization.	S5
3	**Values:**	
3.1		

CLOs		Aligned PLOs
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	The Concept of Limit: definition concept, some question, Continuity and its Consequences: definition concept, some question,	4
2	Asymptotes Definition working rules and some questions, Tangent lines & velocity, The Derivative definition, Computation of Derivatives: some example and basic formula, Power rule	4
3	higher order derivates. The Product and Quotient Rules,	4
4	Chain rule for finding derivatives of composite functions, Derivatives of trigonometric functions.	4
5	By using first law of derivative, Derivatives of Exponential, logarithmic, and hyperbolic functions, Derivatives of hyperbolic functions continue	4
6	Derivatives Implicit differentiation, Inverse functions and their derivative,	4
7	Derivatives Inverse functions continues, Derivatives of high order involving inverse functions	4
8	**L'** Hospital's Rule and undetermined forms, Linear approximation Applications of the Derivative**:** Absolute and local extreme, critical points, Tests for local extreme, concavity and inflection points, and applications,	4
9	Rolle's Theorem: Definition, Mean Value Theorem: Definition & Example, Curve sketching using calculus, Curves of binomial, algebraic, trigonometric functions etc, simple method,	4
10	Integrals: Anti-derivatives definition & result of basic functions, Indefinite Integral, Integration by Substitution: Working method and questions, Integration by Parts : Working rules and questions	4
11	Riemann sums; Definition and process of finding Integral, Definite Integral Continue some questions, Area of curves: Application of integral, The Mean Value Theorem of Integration	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			
2.0	**Skills**		
2.1	CLO-1:Find a limit (numerically, graphically and analytically).	Classroom Method	Quiz, Midterm Final Assignments

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.2	CLO-4:Find and interpret the integrals of elementary functions.	Classroom Method	Quiz, Final Assignments
…	CLO-2:Calculate derivatives of complicated functions.	Classroom Method	Quiz, Midterm Final Assignments
	CLO-5:Pursue later courses in calculus.	Classroom Method	Quiz, Midterm Final Assignments
	CLO-3:Apply differentiation to problems such as related rates, graphing and optimization.	Classroom Method	Quiz, Final Assignments
	CLO-1:Find a limit (numerically, graphically and analytically).	Classroom Method	Quiz, Midterm Final Assignments
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
	Attendance and Class participation	Week 1 to 11	5%
1	Quiz 1	Week 3	7.5%
2	Assignment 1	Week 3	10%
3	Midterm	Week 6	20%
4	Assignment 2	Week 7	10%
5	Quiz 2	Week 9	7.5%
6	Final Exam	Week 12	%40
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Each group of students is assigned to a member of staff who will be available for help and academic guidance office hours at specific hours on daily basis.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Robert Smith, Roland Minton "Calculus, Early Transcendental Functions" McGraw-Hill, 4 edition (2012). ISBN 978–0–07–338311–8
Essential References Materials	Edwards, H.C. and Penney, D.E., 2013. Calculus, Early Transcendentals: Pearson New International Edition PDF eBook. Pearson Higher Ed. Calculus, L. Hostetler & Edwards, Cengage Learning, 10th (2013). Stewart, J., Clegg, D.K. and Watson, S., 2020. Calculus: early transcendentals. Cengage Learning.
Electronic Materials	**a)** tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx . **b)** mathforum.org/calculus/calculus.units.html **c)** https://apstudent.collegeboard.org/apcourse/ap-calculus…/calculator-poli.
Other Learning Materials	Class Notes

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Evaluation	Peers	Verification of Marks
Course Report Verification	Quality Coordinator	Check List

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	

Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Discrete Mathematics
Course Code:	MH 121
Program:	CS/IT
Department:	Basic Sciences and Humanities
College:	College of Computer and Information Sciences
Institution:	Majmaah University

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E. Student Academic Counseling and Support 6

F. Learning Resources and Facilities 6

1.Learning Resources 6

2. Facilities Required 7

G. Course Quality Evaluation 7

H. Specification Approval Data 7

A. Course Identification

1. Credit hours:
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 2
4. Pre-requisites for this course (if any)**: None**
5. Co-requisites for this course (if any)**: None**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	**100%**
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	**33**
2	**Laboratory/Studio**	
3	**Tutorial**	**11**
4	**Others** (specify)	
	Total	

B. Course Objectives and Learning Outcomes

1. Course Description

The course presents a set of mathematical facts and how to apply them for logical and mathematical thinking. Topics include Logic and set theory, Proof Strategy, Mathematical and Structural Induction, Types of relations and set partition, Partial Ordering, Integers and Algorithms, Complexity of Algorithms, Congruencies, Representation of Integers, Principles of Counting, Permutations, Combinations and Graph Theory.

2. Course Main Objective

1. Students will be able to explain and apply the basic methods of discrete (non-contiguous) mathematics in Computer Science.
2. Use logical notation to define and reason about fundamental mathematical concepts such as sets, relations, functions, and integers.
3. Evaluate elementary mathematical arguments and identify fallacious reasoning (not just fallacious conclusions).
4. Synthesize induction hypotheses and simple induction proofs.

5. Prove elementary properties of modular arithmetic and explain their applications in Computer Science, for example, in cryptography and hashing algorithms.
6. Explain and apply the knowledge of graph theory required for the Computer Science.
7. Derive closed-form and asymptotic expressions from series and recurrences for growth rates of processes.
8. Calculate numbers of possible outcomes of elementary combinatorial processes such as permutations and combinations. Calculate probabilities and discrete distributions for simple combinatorial processes; calculate expectations.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1… .		
2	**Skills :**	
2.1	CLO 1: Evaluate logical expressions and perform the basic operations on sets.	S5
2.2	CLO 2: Use the direct method, the contrapositive method, the contradiction method, and the mathematical induction to write a rigorous mathematical proof.	S5
2.3	CLO 3: Apply logical reasoning to solve a variety of problems.	S5
2.4	CLO 4: Apply a wide range of principles of discrete mathematics, such as problem solving, good thinking, choice of algorithm, and mathematical proofs.	S5
2.5	CLO 5: Interact with life problems using different methods of thinking and problem solving	S5
3	**Values:**	
3.1		
3.2		
3…		

C. Course Content

No	List of Topics	Contact Hours
1	Simple and compound statements, Logical connectives, Truth tables, ,Basic logic laws, Applications of Logic	3+1
2	.Operations on sets, Basic laws of set theory, Cartesian product of sets	3+1
3	Proof Strategy, Direct Method, the Contrapositive Method, the ,Contradiction Method	3+1
4	Mathematical Induction and Structural Induction	3+1
5	Basic definitions on relations, Binary relations and their types	3+1
6	Equivalence relation and set partition, Partial Ordering	3+1

7	Further Applications and examples Equivalence relation and set partition, Partial Ordering	3+1
8	Algorithms, Examples of Algorithms, Complexity of Algorithms, .Recursive Definitions, Recursive Algorithms	3+1
9	Integers and Division, The Division Algorithm, Integers Algorithms, .The Euclidean Algorithm, Congruencies, Representation of Integers, Applications	3+1
10	Principles of Counting: The Basics of Counting, The Pigeonhole Principle	3+1
11	Introduction to Graphs, Representation of Graphs. Paths and Cycles, Euler and Hamilton Paths Shortest-Path Algorithms,	3+1
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
1..			
2.0	**Skills**		
2.1	CLO 1: Evaluate logical expressions and perform the basic operations on sets.	Classroom Teaching	Quiz, Home assignment, Mid-Exam, Final Exam
2.2	CLO 2: Use the direct method, the contrapositive method, the contradiction method, and the mathematical induction to write a rigorous mathematical proof.	Classroom Teaching	Quiz, Home assignment, Mid-Exam, Final Exam
2.3	CLO 3: Apply logical reasoning to solve a variety of problems.	Classroom Teaching	Quiz, Home assignment, Mid-Exam, Final Exam
2.4	CLO 4: Apply a wide range of principles of discrete mathematics, such as problem solving, good thinking, choice of algorithm, and mathematical proofs.	Classroom Teaching	Quiz, Home assignment, Mid-Exam, Final Exam
2.5	CLO 5: Interact with life problems using different methods of thinking and problem solving	Classroom Teaching	Quiz, Home assignment, Mid - Exam, Final Exam
3.0	**Values**		
3.1			

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.2			
3…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Attendance and Class participation	Week 1 to 15	5%
2	Quizzes	Week 4, Week 12	15%
3	Assignments/Exercises	Week 4, 8, 12, 15	20%
4	Mid Term Exam	Week 8	20%
5	Final Exam	Week 16	40%
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counseling.
- Available for a minimum of 2 hours per week/course, as communicated to the students.
- The student also contacts through social networking websites / Blackboard/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Discrete Mathematics and Its Applications, K. Rosen, 7th Edition McGraw-Hill, ISBN 978-0-07-338309-5, 2012.
Essential References Materials	Journey into Discrete Mathematics (AMS/MAA Textbooks) by Owen D. Byer (Author), Deirdre L. Smeltzer (Author), Kenneth L. Wantz (Author), American Mathematical Society, ISBN-10: 1470446960, ISBN-13: 978-1470446963, 2018
Electronic Materials	https://ocw.vu.edu.pk/Videos.aspx?cat=Mathematics&course=MTH202 https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-mathematics-for-computer-science-fall-2010/video-lectures/
Other Learning Materials	Blackboard, Class notes

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Feedback	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

Course Specifications

Course Title:	**Calculus-II**
Course Code:	**MH 132**
Program:	**Basic Science**
Department:	**Basic Science**
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

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E. Student Academic Counseling and Support **6**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **7**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours: 3(4,0,1)
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☐ Elective ☐
3. Level/year at which this course is offered: **Level 4**
4. Pre-requisites for this course (if any)**: MATH 112: Calculus 1**
5. Co-requisites for this course (if any)**: None**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	55	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	44
2	Laboratory/Studio	
3	Tutorial	11
4	Others (specify)	
	Total	55
Other Learning Hours*		
1	Study	
2	Assignments	
3	Library	
4	Projects/Research Essays/Theses	
5	Others (specify)	
	Total	

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Catalog Description: This course includes the following topics:

1) Integration Techniques: Review of Integration by Substitution and Integration by Parts, Integration of Rational Functions Using Partial Fractions, Trigonometric Techniques of Integration, and Integrals involving logarithmic, exponential, and hyperbolic functions, Improper Integrals.

2) Infinite series: Sequences and limit of a sequence. Infinite series of constant terms, convergence tests, alternating series and absolute convergence. Power series, the ratio test, and radius of convergence; Taylor and McLaurin series.

3) Vectors and Geometry of Space: Vectors in Space, Dot Product, Cross Product, Lines and Planes in Space, Cylindrical and Spherical Coordinates.

4) Parametric Equations and Polar Coordinates: Plane Curves and Parametric Equations, Calculus and Parametric Equations, Polar Coordinates, Calculus and Polar Coordinates.

5) Functions of several variables and Partial Differentiation: Functions of several variables, Partial derivatives, Total derivative, and Chain rule.

6) Multiple Integrals: Double and Triple Integrals in Cartesian Coordinates; Areas and Volumes, Double Integrals in Polar Coordinates; Triple Integrals in Cylindrical and Spherical Coordinates.

2. Course Main Objective

This course aims at giving student knowledge in fields:

1. Manipulate the integration of complicated functions and evaluate double and triple integrals.
2. Use various tests to determine series convergence and successfully solve problems involving infinite series.
3. Use polar coordinates and their applications in the parametric equations.
4. Differentiate functions of two and three variables.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
2	**Skills :**	
3	**Competence:**	
3.1	CLO (1) Manipulate the integration of complicated functions and evaluate double and triple integrals	C2
3.2	CLO (2) Use various tests to determine series convergence and successfully solve problems involving infinite series.	C2
3.3	CLO (3) Use polar coordinates and their applications in the parametric equations.	C2
3.4	CLO (4) Differentiate functions of two and three variables.	C2

C. Course Content

No	List of Topics	Contact Hours

1	Review of Integration by Substitution and Integration by Parts, Integration of Rational Functions Using Partial Fractions,	4
2	Trigonometric Techniques of Integration, Integrals involving logarithmic, exponential, and hyperbolic functions, Improper Integrals.	4
3	Sequences and limit of a sequence. Infinite series of constant terms, convergence tests, alternating series and absolute convergence.	4
4	Power series, the ratio test, and radius of convergence; Taylor and MacLaurin series.	4
5	Vectors in Space, Dot Product, Cross Product,	4
6	Lines and Planes in Space Cylindrical and Spherical Coordinates.	4
7	Plane Curves and Parametric Equations, Calculus and Parametric Equations	4
8	Polar ordinates, Calculus and Polar Coordinates.	4
9	Functions of several variables, Partial derivatives, Total derivative, Chain rule.	4
10	Double and Triple Integrals in Cartesian Coordinates; Areas and Volumes, Double Integrals in Polar Coordinates;	4
11	Triple Integrals in Cylindrical and Spherical Coordinates.	4
Total		**44**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
2.0	**Skills**		
3.0	**Competence**		
3.1	CLO (1) Manipulate the integration of complicated functions and evaluate double and triple integrals	Classroom Teaching	Quiz, Mid- Exam, Final Exam
3.2	CLO (2) Use various tests to determine series convergence and successfully solve problems involving infinite series.	Classroom Teaching	Quiz, Mid- Exam, Final Exam
3.3	CLO (3) Use polar coordinates and their applications in the parametric equations.	Classroom Teaching	Quiz, Mid- Exam, Final Exam
3.4	CLO (4) Differentiate functions of two and three variables.	Classroom Teaching	Quiz, Mid- Exam, Final Exam

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	Week 3	10%
2	Assignment 1	Week 3	10%
3	Midterm	Week 6	20%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
4	Assignment 2	Week 7	10%
5	Quiz 2	Week 9	10%
	Final Exam	Week 12	%40

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
Each student is allotted to an academic advisor for guidance and counselling

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	**Robert Smith, Roland Minton "Calculus, Early Transcendental Functions" McGraw-Hill, 4 edition (2012). ISBN 978–0–07–338311–8**
Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

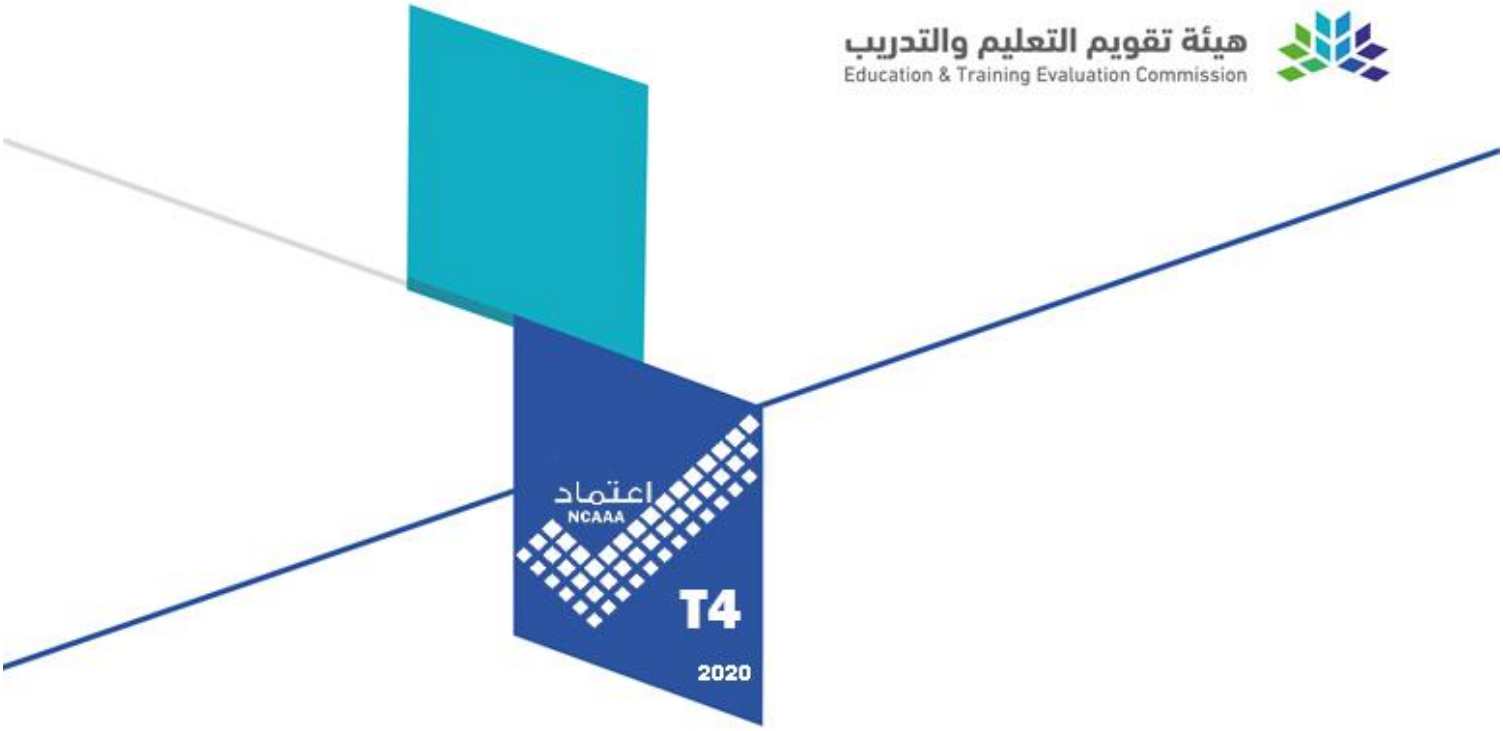
G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Feedback	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	



Course Specifications

Course Title:	Linear Algebra	
Course Code:	MATH 222	
Program:	Computer Science	
Department:	Basic Sciences and Humanities	
College:	College of Computer and Information Sciences	
Institution:	Majmaah University	

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F. Learning Resources and Facilities **6**

1.Learning Resources 6

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G. Course Quality Evaluation **7**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours:
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 5
4. Pre-requisites for this course (if any)**:** N/A
5. Co-requisites for this course (if any)**: N/A**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

Catalog Description: This course includes the following topics:
1) Matrices and Gauss Elimination: Elementary row operations, Transpose of a matrix, Inverse of
a square matrix, Linear equation systems and Gauss eliminations.
2) Determinants: Determinants and their properties, classical adjoint matrix; Cramer's rule.
3) Vector spaces: Basic definitions, subspaces, linear dependence and independence, bases and
dimensions, Rank of a Matrix.
4) Linear transformations: Basic definitions, the matrix of a transform, Kernel and Range of a linear transformation, Matrices of linear transformations, Coordinates and change of basis.
5) Eigenvalues and Eigenvectors: Characteristic polynomial, diagonalization of matrices, Applications involving Powers of matrices.

2. Course Main Objective

This course aims at giving student knowledge in fields:
1) Introduce students to the subject of linear algebra which is essential for subsequent courses in mathematics and computer science.

2) Let students be familiar with basics of matrices and determinants and their applications to solve systems of linear equations.
3) Let students be familiar with basics of vector spaces and linear transformations.
4) Let students be familiar with the notions of eigenvalues and eigenvectors with some of their applications.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO1: Solve systems of linear equations using Gauss Elimination, Cramer's rule, and inverse matrix method.	S5
2.2	CLO2- Understand the general concepts of vector spaces, subspaces, linear dependence and independence, bases, and linear transformations.	S5
2.3	CLO3- Calculate the eigenvalues and eigenvectors of squared matrices.	S5
2.4	CLO4- Solve important problems applying methods of linear algebra.	S5
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to matrices, Elementary row operations	3
2	Inverse of a square matrix, Transpose of a matrix.	2
3	Linear equation systems and Gauss eliminations	4
4	Determinants and their properties, Determinants	4
5	classical adjoint matrix	2
6	Cramer's rule.	3
7	Vector spaces: Basic definitions, subspaces	3
8	Linear dependence and independence	3
9	Basis and dimensions, Rank of a Matrix	3
10	Linear transformations: Basic definitions, The matrix of a transform	3
11	Kernel and Range of a linear transformation	2
12	Matrices of linear transformations, Coordinates and change of basis	4
13	Characteristic polynomial, Eigenvalues and Eigenvectors	3
14	Diagonalization of matrices, Applications involving Powers of matrices	2
15	Revision	3
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			
2.0	**Skills**		
2.1	CLO-1 Solve systems of linear equations using Gauss Elimination, Cramer's rule, and inverse matrix method	Classroom Teaching	Quizzes Mid Exam Assignments Class Test Final Exam
2.2	CLO-2 Solve first-order differential equations Understand the general concepts of vector spaces, subspaces, linear dependence and independence, bases, and linear transformations	Classroom Teaching	Quizzes Mid Exam Assignments Class Test Final Exam
2.3	CLO-3 Calculate the eigenvalues and eigenvectors of squared matrices	Classroom Teaching	Quizzes Mid Exam Assignments Class Test Final Exam
2.4	CLO-4 Solve important problems applying methods of linear algebra..	Classroom Teaching	Quizzes Mid Exam Assignments Class Test

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
			Final Exam
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	3,7,11	20%
2	Assignments	3,6,9,11	15%
3	Mid Term Exam	8	20%
4	Class Participation	All weeks	5%
5	Final Exam	12	40%
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for the availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counseling.
- Available for a minimum of 2 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / Blackboard/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Gareth Williams “Linear Algebra With Applications” Jones and Bartlett, 8th Edition, (2014). **ISBN-13:** 978-1284120097 David C. Lay “Linear Algebra, and Its Applications”, Pearson, 5th Edition (2016) D. Poole, “Linear Algebra: A Modern Introduction”, Brooks Cole; 3rd ed. (2011).
Essential References Materials	
Electronic Materials	

Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Feedback	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Dr. Ahmed Farghaly
Reference No.	
Date	18 September fall 2022

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Differential Equations	
Course Code:	MATH 223	
Program:	Computer Science	
Department:	Basic Sciences and Humanities	
College:	College of Computer and Information Sciences	
Institution:	Majmaah University	

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E. Student Academic Counseling and Support 5

F. Learning Resources and Facilities 6

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation 6

H. Specification Approval Data 7

A. Course Identification

1. Credit hours:
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 5
4. Pre-requisites for this course (if any)**:** MH123
5. Co-requisites for this course (if any)**: N/A**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description
2. Course Main Objective

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		

	CLOs	Aligned PLOs
2	**Skills :**	
2.1	CLO1- Discriminate differential equation and its order	S5
2.2	CLO2- Solve first-order differential equations	S5
2.3	CLO3- Solve higher order differential equations	S5
2.4	CLO4- Use mathematical modeling to solve some applicable problems by differential equations methods.	S5
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to differential Equations. First order Differential Equations	4
2	Separable differential Equations, Linear differential equations,	3
3	Exact differential Equations, Bernoulli and Riccatti Differential Equations.	3
4	Higher order differential Equations: Principle of superposition, the Wronskian	4
5	Homogeneous differential equations with constant coefficients. Reduction of order method	3
6	Undetermined coefficients method, Variation of parameters method	3
7	Mathematical Modeling- Population Growth and decay	3
8	radioactive isotope and carbon dating, Chemical mixtures. RL- electrical series circuits,	3
9	Newton's law of cooling and computing time of death, Drug distribution in human body	2
10	Banking loans and money investment,	2
11	Mathematical Modeling- Higher order Equations	4
12	Vibrating springs and pendulum	2
13	Damped vibration motion	3
14	LRC- electrical series circuits	3
15	Motion of particles in space.A319	2
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			
2.0	**Skills**		
2.1	CLO-1 Discriminate differential equation and its order	Classroom Teaching	Quizzes Mid Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
			Assignments Class Test Final Exam
2.2	CLO-2 Solve first-order differential equations	Classroom Teaching	Quizzes Mid Exam Assignments Class Test Final Exam
2.3	CLO-3 Solve higher order differential equations	Classroom Teaching	Quizzes Mid Exam Assignments Class Test Final Exam
2.4	CLO-4 Use mathematical modeling to solve some applicable problems by differential equations methods.	Classroom Teaching	Quizzes Mid Exam Assignments Class Test Final Exam
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	3,7,11	20%
2	Assignments	3,6,9,11	15%
3	Mid Term Exam	8	20%
4	Class Participation	All weeks	5%
5	Final Exam	12	40%
6			
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for the availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counseling.
- Available for a minimum of 2 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / Blackboard/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Differential Equations with Boundary Value Problems Dennis G.ZILL and Warren S. Wright Brooks/ Cole Cengage learning USA, Year – 2012;Edition -10 ISBN:1111827060
Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Feedback	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Dr. Ahmed Farghaly
Reference No.	
Date	18 September fall 2022

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Numerical Methods
Course Code:	MH 423
Program:	Computer Science
Department:	Basic Sciences and Humanities
College:	CCIS
Institution:	Majmaah University

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D. Teaching and Assessment **4**

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E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours:
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 11
4. Pre-requisites for this course (if any)**: Differential Equations-MH223**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course provides students with techniques in Computational Methods (methods of numerical computations). It helps students understand the concepts of numerical methods and their importance in solving practical problems.

2. Course Main Objective

1. Apply standard techniques to analyze key properties of numerical algorithms such as stability, convergence, ill-conditioning, and Instability
2. Perform data analysis efficiently and accurately using data fitting methods
3. Analyze and use numerical methods for differential equations
4. Perform optimization using well-established methods

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	

CLOs		Aligned PLOs
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO1. Apply standard techniques to analyze key properties of numerical algorithms such as stability, convergence, ill-conditioning, and Instability	S5
2.2	CLO2. Perform data analysis efficiently and accurately using data fitting methods	S5
2.3	CLO3. Analyze and use numerical methods for differential equations	S5
2.4	CLO4. Perform optimization using well-established methods	S5
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	The standard algorithms for numerical computation: Simple Fixed-Point Iteration, The Bisection Method,	4
2	Newton-Raphson method, False-Position Method, Secant Method	4
3	Newton's Divided-Difference Interpolating Polynomials	4
4	Lagrange Interpolating Polynomials	4
5	Newtons forward, and backward interpolation	4
6	Numerical Integrations, Trapezoidal, Simpsons methods	4
7	Differential Equations: Euler's Method Improvements of Euler's Method	4
8	Runge-Kutta Methods, Solving differential equations of order two	4
9	Solution of Systems of Equations, Shooting Method	4
10	Numerical optimization: One-dimensional Unconstrained Optimization, Golden-section search	4
11	Random Search, Newton's, Parabolic interpolation	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
…			
2.0	**Skills**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.1	CLO1. Apply standard techniques to analyze key properties of numerical algorithms such as stability, convergence, ill-conditioning, and Instability	Classroom Teaching	Quiz, Assignments, Mid Exam, Final Exam
2.2	CLO2. Perform data analysis efficiently and accurately using data fitting methods	Classroom Teaching	Quiz, Assignments, Mid Exam, Final Exam
2.3	CLO3. Analyze and use numerical methods for differential equations	Classroom Teaching	Quiz, Assignments, Mid Exam, Final Exam
2.4	CLO4. Perform optimization using well-established methods	Classroom Teaching	Quiz, Assignments, Mid Exam, Final Exam
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1, Quiz2	4,9	15%
2	Midterm Exam	6	20%
3	Home Assignments	2,9	20%
4	Class participation	All weeks	5%
5	Final Examination	12	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each student is allotted to an academic advisor for guidance and counseling.
- Available for a minimum of 2 hours per week/course, as communicated to the students.
- The student also contacts through social networking websites / Blackboard/ Email for advice and consultations.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Steven C. Chapra & P. Canale, Numerical Methods for Scientists and Engineers: McGraw-Hill Science Engineering, 3/e, 2011
Essential References Materials	Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & Sons, 2011, 10th edition
Electronic Materials	

Other Learning Materials	Black Board, Class Notes

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Quiz/Mid Term/ Final Exam assessment	Instructor	Direct
Course Feedback	Students	Survey-Indirect
Final Exam Answer Scripts Verification	Peer faculty members	Review

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	CS Council
Reference No.	45-1444/2
Date	2022

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Physics 1
Course Code:	PHY 123
Program:	Basic Science
Department:	Basic Science
College:	Computer and information Sciences
Institution:	Majmaah University

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A. Course Identification **3**

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2. Course Main Objective 4

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C. Course Content **4**

D. Teaching and Assessment **5**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 5

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours: 3(3,3,1)
2. Course type **a.** University ☐ College ☒ Department ☐ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: Level 2
4. Pre-requisites for this course (if any)**:** Nil
5. Co-requisites for this course (if any)**: Nil**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	77	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	33
3	**Tutorial**	11
4	**Others** (specify)	
	Total	77

B. Course Objectives and Learning Outcomes

1. Course Description

This course is introducing the following topics: Introduction, Measurement, Estimating, The Motion in one and two dimensions. Vectors, Newton's laws of motion, Circular motion, Gravitation, work and energy, the linear momentum and collisions, Rotational motion. Static equilibrium, condition of equilibrium, elasticity, Hooke's law, Young's modulus, stress and strain, shear stress. Simple Harmonic Motion.

2. Course Main Objective

- Provides sensible preparation for areas of engineering, including computer science.
- Provides a broad foundation in basic principles of computer science and engineering.
- The program has a strong emphasis on mechanics and its application.
- Able to interpret physical problems into mathematical form.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1.4		
2	**Skills :**	
2.1	CLO1-Gain knowledge of the basic concepts and principles of Physics, which is relevant to their further studies.	S5
2.2	CLO2- Student can understand the concepts and principles of mechanics through lectures and assessment tools.	S5
2.3	CLO3- Student can able to analyse the physical problem and learn to express mathematical equations.	S5
2.4	CLO4- Able to apply basic principles of Physics in solving problems in a structured process.	S5
3	**Values:**	
3.1		
3.2		
3.3		
3.4		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction, Measurement, Estimating	3
2	Vectors	3
3	Motion in One Dimension	3
4	Motion In Two Dimension	3
5	Newton's laws of motion	3
6	Circular Motion	3
7	Gravitation	3
8	Work and energy	3
9	linear momentum and collisions	3
10	Rotational motion	3
11	Static Equilibrium and elasticity, SHM	3
Total		33

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
1.3			
1.4			
2.0	**Skills**		
2.1	CLO1-Gain knowledge of the basic concepts and principles of Physics, which is relevant to their further studies.	Classroom Teaching, Laboratory	Quiz, Mid Exam, Lab exam, Final Exam
2.2	CLO2- Student can understand the concepts and principles of mechanics through lectures and assessment tools.	Classroom Teaching	Assignment, Mid Exam, Final Exam
2.3	CLO3- Student can able to analyze the physical problem and learn to express mathematical equations.	Classroom Teaching	Assignment, Mid Exam, Final Exam
2.4	CLO4- Able to apply basic principles of Physics in solving problems in a structured process.	Classroom Teaching	Quiz, Mid Exam, Final Exam
3.0	**Values**		
3.1			
3.2			
3.3			
3.4			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	**Assignments**	During the term	10%
2	**Midterm**	During the term	20%
3	**Quiz**	6th week	10%
4	**LAB CONDUCTION**	10th week	**20%**
5	**Final Exam**	**12th week**	40%
6	**Total**		**100%**

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

Students can meet the faculty during advising hours or whenever the faculty is in the office.

Office Hours: 4 Hours/Week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	**TextBook:** 1.Physics: Principles with Applications, Global Edition, Douglas C. Giancoli, Pearson New International Edition, 2016. 2. Physics for Scientists and Engineers with Modern Physics by Jewett and Serway, 9thEdition, Thomson Brooks/Cole 2013.
Essential References Materials	a) Richard P. Feynman, Robert B. Leighton and Matthew Sands, the Feynman Lectures on Physics, 1st Edition (New Millennium Edition). b) Engineering Physics, Gaur and Gupta, Chand Publishers
Electronic Materials	*www.engr.wisc.edu/ep/* *engphys.mcmaster.ca* *www.engphys.ubc.ca/*
Other Learning Materials	• **Computer-based experiments.** • **Professional standards (Models)** **Robotic application**

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom and lab are required as per the recommendation of University.
Technology Resources (AV, data show, Smart Board, software, etc.)	**Enough facilities are present (Such as projector, Video conferencing machine)**
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	**Enough laboratory equipment required**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Evaluation	Peers	Verification of Marks
Course Report Verification	Quality Coordinator	Check List

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Physics-2
Course Code:	PHY 214
Program:	Basic Science
Department:	Basic Science
College:	Computer and information Sciences
Institution:	Majmaah University

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C. Course Content **4**

D. Teaching and Assessment **5**

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E. Student Academic Counseling and Support **6**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 7

G. Course Quality Evaluation **7**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours:	3(3,0,1)
2. Course type	
a.	University ☐ College ☒ Department ☐ Others ☐
b.	Required ☒ Elective ☐
3. Level/year at which this course is offered:	**Level 4**
4. Pre-requisites for this course (if any)**:**	**PHY 123**
5. Co-requisites for this course (if any)**:**	**Nil**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	-
3	**Tutorial**	11
4	**Others** (specify)	-
	Total	44

B. Course Objectives and Learning Outcomes

1.**Course Description** : This course is main topics in electricity and magnetism introducing in the following topics: Introduction to Physics and electricity; Electric fields, Coulomb's law (statement, equation and problems), Gauss' Law (statement, equation and problems), electric potential, capacitance (series and parallel) and dielectric, currents and resistance (Ohm's law), electrical energy and power, direct current circuits, Kirchhoff's rules, magnetic fields, motion of charged particle in a magnetic field, sources of the magnetic field, Faraday's law of induction (statement, equation and problems), Ampere's law.

2. Course Main Objective

1. Gain knowledge of the basic concepts and principles of Physics, which relevant to their further studies.
2. Students can understand the concepts and principles of electricity, through lectures.
3. Students can understand the concepts and principles of magnetism, through lectures.
4. Students identify the relation between Electricity and magnetism
5. Analyses the physical problem and learn to express a mathematical equation.
6. Identify the solutions for physical problems related to the course.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1.4		
1.5		
1.6		
1.7		
2	**Skills :**	
2.1	CLO1: Gain knowledge of the basic concepts and principles of Physics, which relevant to their further studies.	S5
2.2	CLO2: Students can understand the concepts and principles of electricity, through lectures.	S5
2.3	CLO3: Students can understand the concepts and principles of magnetism, through lectures.	S5
2.4	CLO4: Students identify the relation between electricity and magnetism	S5
2.5	CLO5: Students can Analyses the physical problem and learn to express a mathematical equation.	S5
2.6	CLO6: Students can identify the solutions for physical problems related to the course.	S5
3	**Values:**	
3.1		
3.2		
3.7		

C. Course Content

No	List of Topics	Contact Hours
1	Overview of fundamental aspects of Physics and in particular static and current electricity	4
2	Electric fields, Coulomb's law, Gauss' Law	8

3	Electric potential and electric fields	8
4	Capacitance (series and parallel) and dielectric	4
5	Ohm's law, currents and resistance, electrical energy and power	4
6	Direct current circuits, Kirchhoff's rules	4
7	Magnetic fields, motion of charged particle in a magnetic field	4
8	Magnetic forces between two parallel wires, Ampere's law, Biot – Savert's law,	4
9	Electromagnetic induction, Faraday's law of induction, Lenz' rule, electric generators	4
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2			
1.3			
1.4			
1.5			
1.6			
2.0	**Skills**		
2.1	Gain knowledge of the basic concepts and principles of Physics, which relevant to their further studies.	Teaching large groups (lectures), Active learning, cooperative learning, discussions	Quiz, Mid Exam, Final Exam, Homework's
2.2	Students can understand the concepts and principles of electricity, through lectures.	Teaching large groups (lectures), Active learning, cooperative learning, discussions	Quiz, Mid Exam, Final Exam, Homework's
2.3	Students can understand the concepts and principles of magnetism, through lectures.	Teaching large groups (lectures), Active learning, cooperative learning, discussions	Class test, Final Exam, Homework's
2.4	Students identify the relation between Electricity and magnetism	Teaching large groups (lectures), Active learning, cooperative learning, discussions	Final Exam, Home works
2.5	Students can Analyses the physical problem and learn to express a mathematical equation.	Problem based learning. Work based learning.	Quiz, Mid Exam, Final Exam, class test, Home works
2.6	Students can identify the solutions for physical problems related to the course.	Problem based learning. Work based learning.	Quiz, Mid Exam, Final Exam, class test, Home works
3.0	**Values**		
3.1			
3.2			
3.3			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	class test	4	20%
2	midterm	7	20%
3	Home works		20%
4	final exam	as schedule	40%
5	Total		100

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- **Student can access the concern staff during office hours; each student can take the consultation and advice.**
- **Students also contacts through social networking websites/Email for clarification of doubts and consultation.**
- **Available for 2-3 hours in day to the students**

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	**TextBook:** 1.Physics: Principles with Applications, Global Edition, Douglas C. Giancoli, Pearson New International Edition, 2016. 2. Physics for Scientists and Engineers with Modern Physics by Jewett and Serway, 9thEdition, Thomson Brooks/Cole 2013.
Essential References Materials	a) Richard P. Feynman, Robert B. Leighton and Matthew Sands, the Feynman Lectures on Physics, 1st Edition (New Millennium Edition). b) Engineering Physics, Gaur and Gupta, Chand Publishers
Electronic Materials	*www.engr.wisc.edu/ep/* *engphys.mcmaster.ca* *www.engphys.ubc.ca/*
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms prepared, AC, Lights Sources and Seats
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board, Internet
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final exam answer scripts Verification	Faculty members	Review- direct
Course feedback	Students	survey - indirect

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	CCIS MEETING
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Probability and Statistics**
Course Code:	**STAT 133**
Program:	**Computer Science/ Information Technology**
Department:	**Computer Science**
College:	**College of Computer and Information Science**
Institution:	**Majmaah University**

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A. Course Identification

1. Credit hours:	**3(3, 0, 1)**
2. Course type	
a.	University ☐ College ☑ Department ☐ Others ☐
b.	Required ☑ Elective ☐
3. Level/year at which this course is offered:	**Level 2/ Year 2**
4. Pre-requisites for this course (if any)**:**	**MH 113**
5. Co-requisites for this course (if any)**:**	**N/A**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	60	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

Upon successful completion of this course, students will be familiar with basic rules of probability and will be able to use them in modeling uncertainty in obtaining and recording data. They will be able to utilize graphical and numerical summaries of data in understanding data generating processes. They will understand the logic of statistical inference and will be able to apply common inferential procedures. Students will be exposed to the computational aspects of statistics using calculators, spreadsheet programs or special purpose data analysis packages.

2. Course Main Objective

Understanding and applying probability rules, independent random events.
2) Understanding and applying random variables and their probability distribution.
3) Understanding and applying common discrete probability distributions and their

relationships.
4) Understanding and applying common continuous probability distributions and their applications.
5) Understanding and applying sampling distribution of some sample statistics.
6) Understanding and applying principles of estimation, estimation of some population parameters.
7) Understanding and applying the principles of estimation of simple linear regressions.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO-1: Apply probability rules and independent random events	
1.2	CLO-2: Use random variables and their probability distribution	
1.3	CLO-3: Use discrete probability distributions and their relationships	
1.4	CLO4: Use continuous probability distributions and their applications	
1.5	CLO5: Apply sampling distribution of sample statistics	
1.6	CLO-6: Understand the principles of estimation and estimation of population parameters	
1.7	CLO-7: Understand the principles of estimation of simple linear regressions	
2	**Skills :**	
2.1		
2.2		
2.3		
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to sample space, Random events, probability rules	3+1
2	Conditional Probability, Bayes' Rule	3+1
3	Random variables, Definitions of Discrete distribution, mean and variance of a random variable	3+1
4	Random variables, Definitions of continuous distribution, mean and variance of a random variable	3+1
5	Mean of linear combination of independent random variables	3+1
6	Variance of linear combination of independent random variables	3+1
7	Discrete distributions (Binomial, Poisson)	3+1
8	Continuous distributions (Uniform, Exponential, Normal)	3+1
9	Sampling distributions of sample statistics: t-distribution	3+1
10	The concept of estimation methods: Point estimation and Confidence interval estimation, The concept of estimation methods continued: Concepts of testing.	3+1
11	Concepts of simple linear correlation and linear regression	3+1
	Total	44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	CLO-1: Apply probability rules and independent random events	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.2	CLO-2: Use random variables and their probability distribution	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.3	CLO-3: Use discrete probability distributions and their relationships	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.4	CLO4: Use continuous probability distributions and their applications	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.5	CLO5: Apply sampling distribution of sample statistics	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.6	CLO-6: Understand the principles of estimation and estimation of population parameters	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.7	CLO-7: Understand the principles of estimation of simple linear regressions	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
2.0	**Skills**		
2.1			
2.2			
3.0	**Values**		
3.1			
3.2			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	3, 13	20%
2	Assignment	4, 9, 11, 14	20%
3	Midterm	8	20%
4	Final	16	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
Every faculty will be assigned a number of students in the corresponding department for academic advising. Students can meet the faculty during advising hours or whenever the faculty is in the office during the specified office hours.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers and Keying E. Ye, "Probability and Statistics for Engineers and Scientists", Pearson; 10 editions. • Douglas C. Montgomery and, George C. "Applied Statistics and Probability for Engineers", Wiley; 6th edition (2013).
Essential References Materials	• Michael Baron, "Probability and statistics for computer engineers", CRC press, 2nd edition (2013)
Electronic Materials	https://oli.cmu.edu/courses/probability-statistics-open-free/ http://www.extension.harvard.edu/open-learning-initiative/sets-counting-probability
Other Learning Materials	Blackboard, Class notes

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Test/Quiz/Mid Term/ Final Exam assessment (Extent of achievement of course learning outcomes)	Instructure	Direct
Course Survey in the middle of the semester and at the end	Students	Indirect

Evaluation Areas/Issues	Evaluators	Evaluation Methods
of the semester (Effectiveness of teaching and assessment)		
Final Exam Answer Scripts Verification	Peer faculty members	Review (Direct)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	CS Council
Reference No.	45-1444/2
Date	2022