Computer Language-1
Course Specifications 2023-2024

Relevant program	B.Sc. in Computer Science (Computer Science)
Department offers the program	Computer Science
Department offers the course	Computer Science
Academic year	1st Year
Date of specification approval	17/9/2023

A. Basic Information

1. **Course Title:** Computer Language-1
2. **Course Code:** CS112
3. **Prerequisite:** CS101
4. **Credit Hours: 3Hr**
5. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2	2	4

B. Professional Information

1- Professional Information:

1- Overall aim of the course

Upon completing this course, the student will have learned, through appropriate classroom and laboratory experiences, the following.

Describing syntax and semantics. Identifiers: names, binding, type checking, and scopes. Data types, subprograms and their implementation, concurrency, and programming paradigms such as declarative programming. Write a complete C++ program using the different statements of the C++ language.

2- Intended learning outcomes of course (ILOs):

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:

a1- Understand the fundamentals of programming language.
a2- Describe formal syntax and high-level semantics of a programming language.
a7- Explain and apply basic constructs and concepts used in common programming languages.
a9- Identify appropriate programming languages to use to address the specific needs of a stated problem.

b- Intellectual skills:

On successful completion of this course, the student should be able to:

b7- Build independent blocks or functions that can be used in other programs.
b12- Think about Building computer programs.

c- Professional and practical skills:

On successful completion of this course, the student should be able to:

c1-Plan, design, implement, and test computer programs and applications
c3- Familiarize with C++ programming language.
c5- Able to apply computer programming techniques to solve practical engineering problems.

d- General and transferable skills:

On successful completion of this course, the student should be able to:

d5- Work in groups and within constraints.
d6- Present a project or a product.
d7- Present a design of algorithms (flowchart and pseudo code) for solving scientific problems related to other disciplines.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	Describing Syntax and semantics	2	2	a1-a2, b7-b12, c1-c3, d5
2	Describing Syntax and semantics	2	2	a1-a2, b7-b12, c1-c3, d5
3	Identifiers: names,	2	2	a1-a2, b7-b12, c1-c3, d5

	binding, type checking, and scopes			
4	Identifiers: names, binding, type checking, and scopes	2	2	a1-a2, b12, c3, d5,d7
5	Identifiers: names, binding, type checking, and scopes	2	2	a1-a3, b7,b12, c1, d5,d7
6	Data types, subprograms, and their implementation	2	2	a1-a2, b7,b12, c1-c3, d5,d7
7	**8-Mid-Term**			
8	Data types, subprograms, and their implementation	2	2	a1-a2, b7,b12, c1-c3, d5,d7
9	concurrency, programming paradigms	2	2	a7-a9, b7,b12, c1-c3, d5,d7
10	concurrency, programming paradigms	2	2	a7-a9, b7,b12, c1-c3, d5,d7
11	concurrency, programming paradigms	2	2	a7-a9, b7,b12, c1-c3, d5,d7
12	Object-oriented programming	2	2	a2-a9, b7,b12, c1-c5,d6
13	Object-oriented programming	2	2	a2-a9, b7,b12, c1-c5, d6
14	component programming, parallel and distributed programming	2	2	a7-a9, b7,b12, c1-c5, d5,d6

4. Teaching and Learning Methods

4a. Lectures

4b. Tutorial Exercises

4c. Practical Exercises

5. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual and professional skills.
Mid-Term Exam	To measure following up and understanding the studied topics
Class Work	To measure the participation of the student during the tutorial, professional and general skills.

5b. Time Schedule

Assessment	Week No
Final Exam	16
Mid-Term Exam	8

5c. Grading System

The students' points are calculated through the following point distribution.

Assessment	Grade %	ILOS
Final Exam	50%	All
Mid-Term Exam	25%	a1-a2,a3, b7,b12, c1-c3, d5,d7
Class Work	10%	c1, c3,c5 ,d5, d6,d7
Quizes	15%	a1,a3, b7 , c1,c5, d5

5d. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6a. Course Notes

6b. Required Books (Textbooks)

Operations Research Calculations Handbook (Operations Research Series), Dennis Blumenfeld, 2017.

6c. Recommended Books

Multiple Criteria Decision Making in Supply Chain Management (Operations Research Series), A. Ravi Ravindran, 2016.

7. Facilities Required for Teaching and Learning

- A lecture hall is equipped with a projector and a computer.
- Tutorial rooms are equipped with projectors and computers.
- A library.

Course Coordinator: Dr.
Signature:
Date: 12/9/2023
Department Head: Dr. Saeed Khodary Hamouda.
Signature:
Date: 17/9/2023 Saeed hamouda

	parallel and distributed programming																	

Course Coordinator | Dr.

Signature

Department Head: Dr. Saeed Khodary Hamouda

Signature | Saeed hamouda

Course Matrix

Course Name Operations Research **Course Code: CS114**

Course Aims	Course Content	Teaching Weeks	ILOs				Teaching and Learning Methods							Assessment Tools					Criteria
			a's	b's	c's	d's	Lectures	Tutorial Exercises	Practical Exercises	Workshops	Projects	Case Study	Data Collections	Final Exam	Mid-Term Exam	Practical Exam	Class Work	Oral Exam	
• Let students know how to differentiate models properly in data analysis and lay the foundation for more advanced studies in operation research. • Use software applications to perform algorithms used in operations research.	Describing Syntax and semantics	1	a1-a2	b7-b12	c1-c3	d5	✓	✓	✓		✓			✓	✓	✓	✓		Student evaluation, course file, exam results
	Describing Syntax and semantics	2	a1-a2	b7-b12	c1-c3	d5	✓	✓	✓		✓			✓	✓	✓	✓		
	Identifiers: names, binding, type checking, and scopes	3	a1-a2	b7-b12	c1-c3	d5	✓	✓	✓		✓			✓	✓	✓	✓		
	Identifiers: names, binding, type checking, and scopes	4	a1-a2	b12	c3	d5,d7	✓	✓	✓		✓			✓	✓	✓	✓		
	Identifiers: names, binding, type checking, and scopes	5	a1-a3,	b7,b12,	c1	d5,d7	✓	✓	✓		✓			✓	✓	✓	✓		
	Data types, subprograms, and their implementation	6	a1-a2	b7,b12,	c1-c3,	d5,d7	✓	✓	✓		✓			✓	✓	✓	✓		
	Data types, subprograms, and their implementation	7	a1-a2	b7,b12,	c1-c3,	d5,d7	✓	✓	✓		✓			✓	✓	✓	✓		
	concurrency, programming paradigms	8	a1-a2,	b7-b12,	c1-c3	d5	✓	✓	✓		✓			✓	✓	✓	✓		
	concurrency, programming paradigms	9	a1-a2,	b7-b12,	c1-c3	d5	✓	✓	✓		✓			✓	✓	✓	✓		
	Object-oriented programming	10	a1-a2,	b12	c3	d5,d7										✓			
	Object-oriented programming	11	a1-a3	b12	C3	d5,d7	✓	✓	✓		✓			✓	✓	✓	✓		
	component programming,	12	a1-a2	b7,b12	c1-c3,	d5,d7	✓	✓	✓		✓			✓	✓	✓	✓		

Computer Network 2
Course Specifications 2023-2024

Relevant program	B.Sc. in Computer Science (Computer Science)
Department offers the program	Computer Science
Department offers the course	Computer Science
Academic year	Level three
Date of specification approval	17/9/2023

A. Basic Information

1. **Course Title:** computer network 2
2. **Course Code:** CS 313
3. **Prerequisite:** Computer Network-1(CS305)
4. **Credit Hour: 3Hr.**
5. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2	2	4

B. Professional Information

1. Overall aims of the course

Upon completing this course, the student will have learned, through appropriate classroom and laboratory experiences, the following.

- Difference between LANs/MANs and WANS
- Transmission media
- LAN/MANs topologies: Bus; Tree; Ring; Star protocol Architecture
- Logical link control (LLC); Medium access control (MAC)-LLC Services; LLC protocols; Flow control; Error control
- Ethernet (IEEE 802.11, CSMA/CD);
- Frame Component- Mac protocol
- 10 Mbps Ethernet (IEEE 802.11, CSMA/CD)
- Frame Component-MAC protocol
- 10 Mbps Ethernet-100 Mbps Ethernet- Gigabit Ethernet
- Token ring; Frame component-MAC Protocol-Token Priority-Token Maintenance;

- FDDI: Frame component- MAC protocol- Token priority- Token Maintenance, Ring Maintenance; Internetworking: Bridge, Router.

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a1- Demonstrate the understanding of protocols, transmission media, and layered architectures.

a8- Demonstrate the understanding of various network topologies.

a10- Understand how to find the routes by using different routing algorithms

a12- Understand the basics of Internet.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b3. Summarize the proposed solutions and their results in computer networks.

b6. Solve computer network problems with pressing commercial or industrial constraints

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c7- Apply sockets programming and implement client/server programs.

c10- Identify different protocols available in network.

d- General and Transferable Skills

On successful completion of this program, graduates should be able to:

d13. Use Designing skills to solve problems effectively.

d14. Support engineering skills.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	Definition and objectives	2	2	a1,a8
2	Classifications, topologies	2	2	a1,a8,a10
3	3- LANs/MANs and WANS Transmission media	2	2	a1,a8,a10
4	LAN/MANs topologies	2	2	a1,a8,a10
5	- Logical link control (LLC)	2	2	a1,a8,a10,b3,b6,c7
6	Ethernet (IEEE 802.11,CSMA/CD)	2	2	a1,a10,b3,b6,c7,d13
7	Frame Component- Mac protocol	2	2	a1,a8,a10,b6,c7,d13,d14

8	100 Mbps Ethernet	2	2	a8,a10,b6,c7,c10,d13,d14
9	Gigabit Ethernet	2	2	a1,a8,a10,c10,d13,d14
10	Token ring ; Frame component-MAC protocol	2	2	a8,a10,b6,c7,c10,d13,d14
11	Token priority-Token Maintenance	2	2	a8,a10,b6,c7,c10,d13,d14
12	FDDI: Frame component	2	2	a8,a10,a12,b3,b6,c7,c10,d13,d14
13	Internetworking: Bridge, Router	2	2	a8,a10,a12,b6,c7,c10,d13,d14
14	Revision	2	2	a1,a8,a10,a12,b3,b6,c7,c10,d13,d14

4. Teaching and Learning Methods

4a. Lectures

4b. Tutorial Exercises

4c. Practical Exercises

5. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual and professional skills.
Mid-Term Exam	To measure following up and understanding the studied topics
Class Work	To measure the participation of the student during the tutorial, professional and general skills.

5b. Time Schedule

Assessment	Week No
Final Exam	16
Mid-Term Exam	8

5c. Grading System

The students' points are calculated through the following point distribution.

Assessment	Grade %	ILOS
Final Exam	40%	All
Mid-Term Exam	25%	a1,a8,a10,a12,b3,b6,c7,c10,d13,d14
Quizes	10%	a8,a10,b6,c7,c10,d13,d14
Practical Test	25%	c7,c10

5d. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6a. Course Notes

- Short course notes available at doctor's office.

6b. Required Books (Textbooks)

- Andrew S. Tanenbaum ,David J. Wetherall ,"Computer Networks" ,5th Edition,2012

6c. Recommended Books

6d. Web Sites

- Course homepage is accessed from the university website

7. Facilities Required for Teaching and Learning

- A lecture hall is equipped with a projector and a computer.
- Tutorial rooms are equipped with projectors and computers.
- Labs equipped with computers and Internet facilities.
- A library.

Course Coordinator: Dr. Saeed Hamouda

Signature:

Date: 12/9/2023

Department Head: Dr. Saeed Khodary Hamouda

Signature: Saeed hamouda

Date: 17/9/2023

Course Matrix

Course Name Information Security **Course Code** INF423

Course Aims	Course Content	Teaching Weeks	ILOs				Teaching and Learning Methods							Assessment Tools					Criteria
			a's	b's	c's	d's	Lectures	Tutorial Exercises	Practical Exercises	Workshops	Projects	Case Study	Data Collections	Final Exam	Mid-Term Exam	Practical Exam	Class Work	Oral Exam	
▪ Difference between LANs/MANs and WANS • Transmission media • LAN/MANs topologies: Bus; Tree; Ring; Star protocol Architecture • Logical link control (LLC); Medium access control (MAC)-LLC Services; LLC protocols; Flow control; Error control • Ethernet (IEEE 802.11, CSMA/CD); • Frame Component- Mac protocol • 10 Mbps Ethernet (IEEE 802.11, CSMA/CD) • Frame Component-MAC protocol ▪ 10 Mbps Ethernet-100 Mbps Ethernet-Gigabit Ethernet	Definition and objectives	1	1,8	-	–	-	✓	✓	✓		✓			✓	✓		✓		Student evaluation, course file, exam results
	Classifications, topologies	2	1,8,10	-	-	-	✓	✓	✓		✓			✓	✓		✓		
	LANs/MANs	3	1,8,10	-	-	-	✓	✓	✓		✓			✓	✓		✓		
	LAN/MANs topologies	4	1,8,10	-	-	-	✓	✓	✓		✓			✓	✓		✓		
	Logical link control (LLC)	5	1,8,10	3,6	7	-	✓	✓	✓		✓			✓	✓		✓		
	Ethernet (IEEE 802.11,CSMA/CD)	6	1,10	3,6	7	13	✓	✓	✓		✓			✓	✓		✓		
	Frame Component- Mac protocol	7	1,8,10	6	10	13,14	✓	✓	✓		✓			✓	✓		✓		
	100 Mbps Ethernet	8	1,8,10	-	10	13,14	✓	✓	✓		✓			✓	✓		✓		
	Gigabit Ethernet	9	1,8,10	-	10	13,14	✓	✓	✓		✓			✓	✓		✓		
	Token ring ; Frame component-MAC protocol	10	8,10	6	7,10	13,14	✓	✓	✓		✓			✓	✓		✓		
	Token priority-Token Maintenance	11	8,10	6	7,10	13,14	✓	✓	✓		✓			✓	✓		✓		
	FDDI: Frame component	12	8,10,12	3,6	7,10	13,14	✓	✓	✓		✓			✓	✓		✓		
	Internetworking: Bridge, Router	13	8,10,12	6	7,10	13,14	✓	✓	✓		✓			✓	✓		✓		
	Revision	14	1,8,10,12	3,6	7,10	13,14	✓	✓	✓		✓			✓	✓		✓		

Course Coordinator | Dr. Saeed Hamouda Department Head | Dr. Saeed Khodary Hamouda

Signature | Signature | Saeed Hamouda

Object Oriented Programming
Course Specifications 2023-2024

Relevant program	B.Sc. in Computer Science (Computer Science)
Department offers the program	Computer Science
Department offers the course	Computer Science
Academic year	4nd Year
Date of specification approval	17/9/2023

A. Basic Information

1. **Course Title:** Object Oriented Programming
2. **Course Code:** CS411
3. **Prerequisite:** Data Structure (CS113)
4. **Credit Hours: 3Hr.**
5. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2	2	4

B. Professional Information

1. Overall aims of the course

The student should understand what object-oriented programming is.
This course builds on the foundation provided by preliminary courses in introduction to computers and programming, to introduce the fundamental concepts of data structures and the algorithms that proceed from them. Topics include recursion, fundamental data structures (including stacks, queues, linked lists, hash tables, trees, and graphs), and the basics of algorithmic analysis. At the end of the semester, if time permits, and if a course in Object Oriented Programming (typically in C++) is at least going in parallel with this course in the same semester, the underlying philosophy of object-oriented programming can be applied to some data structure, e.g. stacks.

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a6. Describe the Modeling Problems.

a20. Apply the principles of Object-Oriented Programming.

b. Intellectual Skills

b3. Develop Analytical Skills.

b5. Collaborate Modeling and Simulation.

b8. Gather and assess relevant information, using abstract ideas to interpret it effectively.

b9. Design and implement Programming methods.

B18. Represent Data structures.

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Choose the appropriate Programming Language.

c9. Design computer-based systems.

c16. Design of web pages based on the principles of human-computer interactions.

d- General and Transferable Skills

On successful completion of this program, graduates should be able to:

d3. Use different Problem Solving techniques.

d5. Follow Creative Thinking.

d11. Clarify Ideas formulation and presentation.

d13. Practice Designing skills in software projects.

d14. Practice Engineering skills for software development.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	Revision 1: Pointers. - Pointers with (arrays, functions, structures). Structures. - Debugging.	2	2	a6,a11, b3, c1,c5, d3
2	Revision 2: Functions (call by value and call by reference). Overloading, default arguments. Storage class specifier.	2	2	a6,a11, b8, c1,c8, d4
3	Classes: - Class member access. - Constructor / Destructor.	2	2	a11, b3,b8, c1,c5, d4,d3
4	Classes: - Overloading constructor functions. - Assigning objects. - Passing objects to functions. - This keyword.	2	2	a11, b8, c1,c8, d3
5	5- Operator overloading: - Member functions. - Binary operators such as(+, -, *, /) - Unary operators such as(++, --, (),	2	2	a6,a20, b8, c1, d4

6	Scalar and vector quantization	2	2	a6,b8,b9, c5, d4
7	Inheritance: - Inheriting multiple base class. - Discuss an example to illustrate multiple classes.	2	2	b14, c8, d3,d4,d16
9	Polymorphism: - Pointers to derived types. - Virtual function. - Virtual base class. - Abstract classes. Coding ; Adaptive techniques	2	2	b8,b11,c16,c5, d4,d16
10	Files Input / Output: - Streams. - Stream classes.	2	2	b9,b14,c1,d6,d3,d4,d13
11	Templates and exception handling	2	2	b14, c8, d3,d4

4. Teaching and Learning Methods

4a. Lectures

4b. Projects-based learning – Self learning

4c. Practical learning

5. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual and professional skills.
Mid-Term Exam	To measure following up and understanding the studied topics
Quizes	To measure the participation of the student during the tutorial, professional and general skills.

5b. Time Schedule

Assessment	Week No
Final Exam	16
Mid-Term Exam	8

5c. Grading System

The students' points are calculated through the following point distribution.

Assessment	Grade %	ILOS
Final Exam	50%	ALL
Mid-Term Exam	25%	a11, b8, c1,c8, d3
Quizes	10%	b9,b14, c1, d6,d3,d4,d16
Final practical exam	15%	a20,c1,c9,c16

5d. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6a. *A-Course notes*

(Applicable /Not Applicable)

6b. B-Essential books (text books)

- Balagurusamy, "Object Oriented Programming with C++", 6th edition, McGraw-Hill, @2013.

6c. C-Recommended books

- Langsam, Y., M. Augenstein, and A.M. Tenenbaum, Data structures using C and C++. 2nd ed. 1996, Upper Saddle River, N.J.: Prentice Hall. xvi, 672 p.
- Sedgewick, R., Algorithms in C. 3rd ed. 1998, Reading, Mass.: Addison-Wesley. <v. 1-2 in 5 >.
- ale, N.B., C++ plus data structures. 4th ed. 2006, Sudbury, MA: Jones and Bartlett Publishers.

6d. D- Periodicals

6e. E-E-learning

- LMS

6f. F- web sites

- Course homepage is accessed from the university e-learning website.

7. Facilities Required for Teaching and Learning

- A lecture hall is equipped with a projector and a computer.
- Tutorial rooms are equipped with projectors and computers.
- A library.

Course Coordinator:

Signature:

Date: 11/9/2023

Department Head: Dr. Saeed Khodary Hamouda

Signature: Saeed hamouda

Date: 17/9/2023

Course Matrix

Course Name Object Oriented Programming **Course Code:** CS411

Course Aims	Course Content	Teaching Weeks	ILOs				Teaching and Learning Methods							Assessment Tools					Criteria
			a's	b's	c's	d's	Lectures	Tutorial Exercises	Practical Exercises	Workshops	Projects	Case Study	Data Collections	Final Exam	Mid-Term Exam	Practical Exam	Class Work	Oral Exam	
• Through this process, the complexity is reduced and larger programs can be managed. • All object-oriented programming languages have three things in common: encapsulation, polymorphism, and inheritance. • Also, the student should know that the object-oriented programming has taken the best ideas of structured programming and has combined them with several powerful concepts to allow the programmer to organize his programs more effectively Competitive learning, filter learning, spatiotemporal learning	Pointers. - Pointers with (arrays, functions, structures). Structures. - Debugging.	1-2	6,11	3	1,5,	3	✓	✓	✓		✓			✓	✓	✓	✓		Student evaluation, course file, exam results
	Functions (call by value and call by reference). Overloading, default arguments. Storage class specifier.	3,11	8	1,8	4	1-5	✓	✓	✓		✓			✓	✓	✓	✓		
	Classes: - Class member access. - Constructor / Destructor.	7-8	11	3,8	1,5	3,4	✓	✓	✓		✓			✓	✓	✓	✓		
	Classes: - Overloading constructor functions. - Assigning objects. - Passing objects to functions. - This keyword.	8-11	11	8	1,8	3	✓	✓	✓		✓			✓	✓	✓	✓		
	Operator overloading: - Member functions. - Binary operators - Unary operators	12-14	6,20	8	1	4,16	✓	✓	✓		✓			✓	✓	✓	✓		

	Scalar and vector quantization	12-14	6	8,9	5	4	✓	✓	✓		✓			✓	✓	✓	✓			
	Inheritance: - Inheriting multiple base class. - Discuss an example to illustrate multiple classes.	12-14	-	14	8	3,4,16	✓	✓	✓		✓			✓	✓	✓	✓			
	Polymorphism: - Pointers to derived types. - Virtual function. - Virtual base class. Abstract classes. Coding ; Adaptive techniques	12-14	-	8,11	5	4,16	✓	✓	✓		✓			✓	✓	✓	✓			
	Files Input / Output: - Streams. Stream classes.	12-14	-	9,14	1	3,4,6,13	✓	✓	✓		✓			✓	✓	✓	✓			
	Templates and exception handling	12-14	-	14	8	3-4	✓	✓	✓		✓			✓	✓	✓	✓			

Course Coordinator	Dr.	Department Head	Dr. Saeed Khodary Hamouda
Signature		Signature	Saeed hamouda

Operating System II
Course Specifications 2023-2024

Relevant program	B.Sc. in Computer Science (Computer Science)
Department offers the program	Computer Science
Department offers the course	Computer Science
Academic year	4nd Year
Date of specification approval	17/9/2023

A. Basic Information

1. **Course Title: Operating System II**
2. **Course Code: CS402**
3. **Prerequisite: Operating System I (CS215)**
3. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2	2	4

B. Professional Information

1. Overall aims of the course

Upon completing this course, the student will have learned, through appropriate classroom and laboratory experiences, the following.

1. Real- time operating systems and mobile computing.
2. Using principles gained in this class to understand problems in distributed systems.
3. Using principles gained in this class to understand problems in distributed systems.
4. Developing practical skills needed for designing, augmenting and configuring an OS to be suitable for a particular deployment.
5. To feel competent to design, augment and configure; distributed OS, Multimedia OS and mobile computing.

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a1. Study and explore the internals of different types of operating system.

a2. Explain advanced concepts in distributed operating systems.

a3. Identify advanced topics such as multimedia operating systems, real- time operating systems and mobile computing.

a4. Identify the methods used in defining and assessing criteria for measuring the extent to which a computer system is appropriate for its current deployment and future evolution

b. Intellectual Skills

b1. Identify bottlenecks lie in the different types of operating systems.

b2. Recognize the differences between various types of operating systems.

b3. Perform comparisons between (algorithms, methods, techniques...etc).

b4. Identify attributes, components, relationships, patterns, main ideas, and errors.

b5. Assess criteria to measure the appropriateness of a computer system for its current deployment and future evolution, and to interpret the results thereof

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Use different types of operating systems.

c2. Specify, design, and implement some components of distributed operating systems.

c3. Evaluate operating systems in terms of general quality attributes and possible tradeoffs.

c4. Apply the principles of effective information management, information organization, and information-retrieval skills to distribute file systems.

c5. Identify any risks or safety aspects that may be involved in the operation of distributed systems

d- General and Transferable Skills

On successful completion of this program, graduates should be able to:

d1. Collaborate effectively within multidisciplinary team.

d2. Work in stressful environment and within constraints.

d3. Communicate effectively.

d4. Demonstrate efficient OS capabilities.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	

1	1-File systems: File concept	2	2	a1-a3 , b1, b4-b5,d1-d4
2	2-access methods	2	2	a1, a2, a4, b1, b2, b5, c2-c5, d1-d4
3	directory systems	2	2	a1-a3, a4 , b3, b5, c2-c5, d1-d4
4	4-file protection	2	2	a1, a2, a4 , b1, b3-b5, c1, d1-d4
5	5-Processes synchronization: Process Concept	2	2	a1, a4 , b4-b5, c1, d1-d4
6	6- the producer/consumer problem	2	2	a1-a3 , b4-b5, c1, d1-d4
7	7- the critical section problem	2	2	a1 , b4-b5, c1, d1-d4
8	8-Mid-Term			
9	9- semaphores, deadlock	2	2	a1, a2, a4 , b4-b5, c1, d1-d4
10	10- inter-process communications	2	2	a1, a2, a4 , b4-b5, c1, d1-d4
11	11-threads, language constructs	2	2	a1, a2, a4 , b4-b5, c1, d1-d4
12	12- Distributed operating systems: distributed systems structures	2	2	a1, a2, a4 , b1, b2, b5, d1-d4
13	13- distributed file systems	2	2	a1, a2, a4 , b1, b2, b5, d1-d4
14	14-distributed coordination	2	2	a1, a2, a4 , b4-b5, c1, d1-d4
15	15- Protection and security	2	2	a1, a2, a4 , b4-b5, c1, d1-d4
16	16-Final Exam			

4. Teaching and Learning Methods

4a. Lectures

4b. Projects-based learning – Self learning

4c. Practical learning

5. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual and professional skills.
Mid-Term Exam	To measure following up and understanding the studied topics
Quizes	To measure the participation of the student during the tutorial, professional and general skills.

5b. Time Schedule

Assessment	Week No
Final Exam	16

Mid-Term Exam	8

5c. Grading System

The students' points are calculated through the following point distribution.

Assessment	Grade %	ILOs
Final Exam	50%	a1, a2, a4 , b4-b5, c1, d1-d4
Mid-Term Exam	25%	a1, a2, a4 , b4-b5
Quizes	15%	a2, a4 , b4-b5, c1, d1-d4
Practical exam	10%	a2, a4 , c1, d1-d4

5d. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6.1. B-Essential books (text books)

6.2. C-Recommended books

1- Tanenbaum, "Modern Operating Systems", Prentice Hall, Inc., 3th Edition, @2008.

2- A. Silberschatz, P. Galvin, and G. Gagne, "Operating System Concepts", John Wiley Publishing Company, 7th Edition, @2005.

6.3. F- web sites

- Course homepage accessed from the university e-learning website.

7. Facilities Required for Teaching and Learning

- A lecture hall is equipped with a projector and a computer.
- Tutorial rooms are equipped with projectors and computers.
- A library.

Course Coordinator:

Signature:

Date: 13/9/2023

Department Head: Dr. Saeed Khodary Hamouda

Signature: Saeed hamouda

Date: 17/9/2023

Course Matrix

Course Name Information Security **Course Code** INF423

Course Aims	Course Content	Teaching Weeks	ILOs				Teaching and Learning Methods							Assessment Tools					Criteria
			a's	b's	c's	d's	Lectures	Tutorial Exercises	Practical Exercises	Workshops	Projects	Case Study	Data Collections	Final Exam	Mid-Term Exam	Practical Exam	Class Work	Oral Exam	
• Real- time operating systems and mobile computing. • Using principles gained in this class to understand problems in distributed systems. • Using principles gained in this class to understand problems in distributed systems. • Developing practical skills needed for designing, augmenting and configuring an OS to be suitable for a particular deployment. • To feel competent to design, augment and configure; distributed OS, Multimedia OS and mobile computing.	File systems: File concept	1-2	1-3	1, 4-5	–	1-4	✓	✓	✓		✓			✓	✓		✓		Student evaluation, course file, exam results
	access methods	3	1, 2, 4,	1, 2, 5	2-5	1-4	✓	✓	✓		✓			✓	✓		✓		
	directory systems	4	1-3, 4	3, 5	2-5	1-4	✓	✓	✓		✓			✓	✓		✓		
	file protection	5	1, 2, 4	1, 3-5	1	1-4	✓	✓	✓		✓			✓	✓		✓		
	Processes synchronization: Process Concept	6	1, 4	4-5	1	1-4	✓	✓	✓		✓			✓	✓		✓		
	the producer/consumer problem	7	1-3	4-5	1	1-4	✓	✓	✓		✓			✓	✓		✓		
	the critical section problem	8	1	4-5	1	1-4	✓	✓	✓		✓			✓	✓		✓		
	semaphores, deadlock	9	1, 2, 4	4-5	1	1-4	✓	✓	✓		✓			✓	✓		✓		
	inter-process communications	10	1, 2, 4	4-5	1	1-4	✓	✓	✓		✓			✓	✓		✓		
	threads, language constructs	11	1, 2, 4	4-5	1	1-4	✓	✓	✓		✓			✓	✓		✓		
	Distributed operating systems: distributed systems structures	12	1, 2, 4	4-5	1	1-4	✓	✓	✓		✓			✓	✓		✓		
	distributed file systems	13	1, 2, 4	1, 2, 5	-	1-4	✓	✓	✓		✓			✓	✓		✓		
	distributed coordination	14	1, 2, 4	1, 2, 5	-	1-4	✓	✓	✓		✓			✓	✓		✓		
	Protection and security	14	1, 2, 4	4-5	1	1-4	✓	✓			✓			✓	✓		✓		

Course Coordinator Dr. Department Head Dr. Saeed Khodary Hamouda

Saeed hamouda.

Software Engineering-1
Course Specifications 2023-2024

Relevant program	B.Sc. in Computer Science (Computer Science)
Department offers the program	Computer Science
Department offers the course	Computer Science
Academic year	3*rd* Year
Date of specification approval	17/9/2023

A. Basic Information

1. **Course Title: Software Engineering-1**
2. **Course Code:** CS304
3. **Prerequisite:** Assembly Language (CS302)
4. **Credit Hours: 3 Hr.**
3. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2	2	4

B. Professional Information

1. Overall aims of the course

Upon completing this course, the student will have learned, through appropriate classroom and laboratory experiences, the following.

- The skill with which we can apply engineering methods and tools will depend on the degree to which we have a clear and precise view of our objectives.
- In the realm of software engineering our objectives will always be stated in terms of desired properties of the resultant software.
- Four properties that are sufficiently general to be accepted as goals for the entire discipline of software engineering are modifiability, efficiency, reliability, and understandability.

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a9. Outline the principles of Software Engineering.
a11. Extrapolate the engineering process of software production.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b11. Plan, conduct and present Software Projects.

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

C2. Choose the appropriate Operating system.
C5. Investigate and use of Information Technology skills.
C8. Develop an effective risk management plan.
C10. Detect safety aspects.
C11. Discover efficient design of human-computer interfaces.

d- General and Transferable Skills

On successful completion of this program, graduates should be able to:

d7. Use Modeling capability in software projects.
d15. Practice Designing skills in software projects.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	Overview of software engineering 1	2	2	a9,a11,c10
2	Overview of software engineering 2	2	2	a11, b11,c2,c8
3	Software requirement: requirement engineering processes. 1	2	2	b11, c2,c8,c11,d7
4	Software requirement: requirement engineering processes. 2	2	2	a9, b11,c5,c8,c10
5	system models 1	2	2	a11, b11, c2,c5,d11
6	system models 2	2	2	a9,a11, b11,c2,c4,c10
7	software prototyping	2	2	a9,a11, b11 ,c2,c4,c5
8	**Midterm Examination**			
9	Design: architecture design. 1	2	2	a9, c2,c4,c8,d11
10	Distributed system architecture procedure calls 1	2	2	a9,a11, b11,c2,c4,c10
11	Distributed system architecture 2	2	2	b11, c2,c8,c11
12	object oriented design 1	2	2	a11, b11,c2,c8,d7
13	Testing	2	2	a9,b11,c10,d7,d11

14	Implementation	2	2	a9,a11, b11,c2,c4,c10
15	Revision	2	2	a9,a11,b11,c10,d7,d11
16	**Final Examination**			

4. Teaching and Learning Methods

4a. Lectures

4b. Tutorial Exercises

4c. Practical Exercises

5. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual and professional skills.
Mid-Term Exam	To measure following up and understanding the studied topics
Class Work	To measure the participation of the student during the tutorial, professional and general skills.

5b. Time Schedule

Assessment	Week No
Final Exam	16
Mid-Term Exam	8

5c. Grading System

The students' points are calculated through the following point distribution.

Assessment	Grade %	ILOS
Final Exam	50%	All
Mid-Term Exam	25%	a9,a11,b11,c10,d7,d11
Class Work	10%	b11, c2,c8,c11
Quizes	5%	b11, c2,c8,c11,d7
Practical Test	10%	c2,5,c8,c10,c11

5d. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6a. Course Notes

6b. Required Books (Textbooks)

- A. Silberschatz, P. Galvin, and G. Gagne, "Assembly Language Concepts", John Wiley Publishing Company, Seventh Edition, 2005.

6c. Recommended Books

- Tanenbaum, "Modern Software Engineering" ", Prentice Hall, Inc.,Third Edition, 2008

7. Facilities Required for Teaching and Learning

- A lecture hall is equipped with a projector and a computer.
- Tutorial rooms are equipped with projectors and computers.
- A library.

Course Coordinator: Dr.

Signature:

Date: 13/9/2023

Department Head: Dr.

Signature: Saeed hamouda.

Date: 17/9/2023

Course Matrix

Course Name Software Engineering 1 **Course Code** CS304

Course Aims	Course Content	Teaching Weeks	ILOs				Teaching and Learning Methods							Assessment Tools					Criteria
			a's	b's	c's	d's	Lectures	Tutorial Exercises	Practical Exercises	Workshops	Projects	Case Study	Data Collections	Final Exam	Mid-Term Exam	Practical Exam	Class Work	Oral Exam	
• The skill with which we can apply engineering methods and tools will depend on the degree to which we have a clear and precise view of our objectives. • In the realm of software engineering our objectives will always be stated in terms of desired properties of the resultant software. • Four properties that are sufficiently general to be accepted as goals for the entire discipline of software engineering are modifiability, efficiency, reliability, and understandability.	Overview of software engineering 1	1	9,11	-	10	-	✓	✓	✓		✓			✓	✓		✓		Student evaluation, course file, exam results
	Overview of software engineering 2	2	11	11	2,8	-	✓	✓	✓		✓			✓	✓		✓		
	Software requirement: requirement engineering processes. 1	3	-	11	2,8,11	7	✓	✓	✓		✓			✓	✓		✓		
	Software requirement: requirement engineering processes. 2	4	9	11	5,8,10	-	✓	✓	✓		✓			✓	✓		✓		
	system models 1	5	11	11	2	11	✓	✓	✓		✓			✓	✓		✓		
	system models 2	6	9,11	11	2,4,10	-	✓	✓	✓		✓			✓	✓		✓		
	software prototyping	7	9,11	11	2,4,5	-	✓	✓	✓		✓			✓	✓		✓		
	Midterm Examination																		
	Design: architecture design. 1	9	9	-	2,4,8	11	✓	✓	✓		✓			✓	✓		✓		
	Design: architecture design.2	10	9,11	11	2,4,10	-	✓	✓	✓		✓			✓	✓		✓		
	Distributed system architecture procedure calls	11	-	11	8,11	-	✓	✓	✓		✓			✓	✓		✓		
	object oriented design 1	12	11	11	2,8	7	✓	✓	✓		✓			✓	✓		✓		
	Testing	13	9	11	-	7,11	✓	✓	✓		✓			✓	✓		✓		
	Implementation	14	9,11	11	2,4,10	-	✓	✓	✓		✓			✓	✓		✓		
	Revision	15	9,11	11	10	7,11	✓	✓	✓		✓			✓	✓		✓		

Course Coordinator | Dr. Department Head | Dr. Saeed Khodary

Signature | Signature | Saeed hamouda

Software Engineering II
Course Specifications 2023-2024

Relevant program	B.Sc. in Computer Science (Computer Science)
Department offers the program	Computer Science
Department offers the course	Computer Science
Academic year	$4th$ Year
Date of specification approval	17/9/2023

A. Basic Information

1. **Course Title: Software Engineering II**
2. **Course Code:** CS314
3. **Prerequisite:** Software Engineering (CS304)
4. **Credit Hours: 3Hr**
5. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2	2	4

B. Professional Information

1. Overall aims of the course

Upon completing this course, the student will have learned, through appropriate classroom and laboratory experiences, the following.

- To help students to develop skills that will enable them to construct software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain.
- introduce students to software development life cycle and models for developing and effective and efficient software and
- To foster an understanding of why these skills are important.

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a6. Describe the software development life cycle as well as describing the various software developments model and understand the advantages and disadvantages of each model

a9. Illustrate the software requirement specification, and system design

a11. Understand the purpose and functionality of UML

a13. Understand the use of model checking and be able to use it effectively

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b4. Recognize and assemble components.

b5. Focus, gather information, integrate, and evaluate the data for Problem Solving.

b10. Distinguish Diagnosis Techniques.

b11. Plan, conduct and present Software Projects.

b13. Design software solutions to real world problems.

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Choose the appropriate Programming Language.

c2. Choose the appropriate Operating system.

c4. Lead a team and Work in a team.

c7. Prepare Technical Reports.

c14. Develop an effective risk management plan.

d- General and Transferable Skills

On successful completion of this program, graduates should be able to:

d6. Use Modeling capability in software projects.

d8. Practice Management Skills.

d11. Clarify Ideas formulation and presentation.

d13. Practice Designing skills in software projects.

d14. Practice Engineering skills for software development.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	Software reuse 1	2	2	a6,a9,a13
2	Software reuse 2	2	2	a11, b4, b5, b10, c1
3	Component-based software engineering 1	2	2	b4, c1,c4
4	Component-based software engineering 2	2	2	a9, b4,b5,b10,d8

5	Distributed software engineering 1	2	2	a9, b4, c2,d6
6	Distributed software engineering 2	2	2	a11,a13, b4,b10, c1,c2,c4
7	Service-oriented architecture 1	2	2	a6,a9, b4,b5, c1,c2,c4
8	**Midterm Examination**			
9	Service-oriented architecture 2	2	2	a6, b4,b10, c1,c2,c4
10	Service-oriented architecture 3	2	2	a6,a9,a11, a13, b4, b10, c2,d13
11	Embedded software 1	2	2	a6,a9,a11, a13, b4, b10, c1
12	Embedded software 2	2	2	a6,a9,a11, a13, b4, b10, c1
13	Real-time software engineering	2	2	a6,a9,a11, a13, b4, b10, c1,d11
14	Software Project management	2	2	a6,a9,a11, a13, b4, b10, c7,d11
15	Revision	2	2	a6,a9,a11, a13, b4, b10, c14,d14
16	**Final Examination**			

4. Teaching and Learning Methods

4a. Lectures

4b. Tutorial Exercises

4c. Practical Exercises

5. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual and professional skills.
Mid-Term Exam	To measure following up and understanding the studied topics
Class Work	To measure the participation of the student during the tutorial, professional and general skills.

5b. Time Schedule

Assessment	Week No
Final Exam	16
Mid-Term Exam	8

5c. Grading System

The students' points are calculated through the following point distribution.

Assessment	Grade %	ILOS
Final Exam	50%	All
Mid-Term Exam	25%	a6,a9,a11, a13, b4, b10, c1,d14

Class Work	10%	a11,a13, b4,b10, c1,c2,c4
Quizes	5%	a9, b4, c2,d6
Practical Test	10%	c1,c2,c4,c7,c14

5d. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6a. Course Notes

6b. Required Books (Textbooks)

- A. Silberschatz, P. Galvin, and G. Gagne, "Software Engineering Concepts", John Wiley Publishing Company, 7th Edition, 2005.

6c. Recommended Books

- Tanenbaum, "Modern Software Engineering".

7. Facilities Required for Teaching and Learning

- A lecture hall is equipped with a projector and a computer.
- Tutorial rooms are equipped with projectors and computers.
- A library.

Course Coordinator: Dr.
Signature:
Date: 12/9/2023
Department Head: Dr. Saeed Khofary
Signature: Saeed Khamouda.
Date: 17/9/2023

Course Matrix

Course Name Software Engineering II **Course Code** CS314

Course Aims	Course Content	Teaching Weeks	ILOs				Teaching and Learning Methods							Assessment Tools					Criteria
			a's	b's	c's	d's	Lectures	Tutorial Exercises	Practical Exercises	Workshops	Projects	Case Study	Data Collections	Final Exam	Mid-Term Exam	Practical Exam	Class Work	Oral Exam	
• To help students to develop skills that will enable them to construct software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain. • introduce students to software development life cycle and models for developing and effective and efficient software and • To foster an understanding of why these skills are important. •	Software reuse 1	1	6,9,13	-	–	-	✓	✓	✓		✓			✓	✓		✓		Student evaluation, course file, exam results
	Software reuse 2	2	11	4,5,10	1	-	✓	✓	✓		✓			✓	✓		✓		
	Component-based software engineering 1	3	-	4	1,4	1-5	✓	✓	✓		✓			✓	✓		✓		
	Component-based software engineering 2	4	9	4,5,10	-	8	✓	✓	✓		✓			✓	✓		✓		
	Distributed software engineering 1	5	9	4	2	6	✓	✓	✓		✓			✓	✓		✓		
	Distributed software engineering 2	6	11,13	4,10	1,2,4	-	✓	✓	✓		✓			✓	✓		✓		
	Service-oriented architecture 1	7	6,9	4,5	1,2,4	1-5	✓	✓	✓		✓			✓	✓		✓		
	Midterm Examination																		
	Service-oriented architecture 2	8	6	4,10	1 ,2,4	-	✓	✓	✓		✓			✓	✓		✓		
	Service-oriented architecture 3	9	6,9,11,13	4,10	2	13	✓	✓	✓		✓			✓	✓		✓		
	Embedded software 1	10	6,9,11,13	4,10	1	-													
	Real-time software engineering	11	6,9,11,13	4,10	1	-	✓	✓	✓		✓			✓	✓		✓		
	Aspect-oriented software engineering 1	12	6,9,11,13	5,10	7	11	✓	✓	✓		✓			✓	✓		✓		
	Software Project management	13	6,9,11,13	5,10	7	11	✓	✓	✓		✓			✓	✓		✓		
	Revision	14	6,9,11,13	4,10	14	14	✓	✓	✓		✓			✓	✓		✓		

Course Coordinator | Dr.Mohamed Abdallah Department Head | Dr. Dr. Saeed Khofary

Saeed hamouda

Course name: Object Oriented Programming

Code: CS411

Course Specifications

- **University: Nahda (NUB)**
- **Program(s) on which the course is given:** Computer Science
- **Department offering the programs:** Faculty of computer science
- **Department offering the course:** Computer science
- **Academic year / level: level four**
- **Last date of specification approval: Spring 2021-2022**

1. Basic Information

- **Prerequisites**: CS113
- **Title:** Object Oriented Programming
- **Code: CS411**
- **Credit hours : 3**
- **Lecture: 2**
- **Practical: 2**
- **Total:** 4

2. Professional Information:

1-Overall aim of the course

BY the end of the course the student must be able to:

The student should understand what object-oriented programming is. Through this process, the complexity is reduced and larger programs can be managed.

All object-oriented programming languages have three things in common: encapsulation, polymorphism, and inheritance. Also, the student should know that the object-oriented programming has taken the best ideas of structured programming and has combined them with several powerful concepts to allow the programmer to organize his programs more effectively

2- Intended learning outcomes of course (ILOs):

BY the end of the course the student must be able to:

A-Knowledge and understanding

a1) Understand different programming approaches.

a2) Know about The difference between structured programming and object oriented programming.

a3) Understand objects and method of modeling them in Object-oriented Programming System

a4) Understand three main features of object-oriented programming: encapsulation, polymorphism, and inheritance.

B-Intellectual skills

b1) Think in object-oriented programs.

b2) Build independent modules (classes and objects) that can be used in different programs.

C-Professional and/or Practical skills

c1) Implement and develop an object-oriented program efficiently.

c2) Benefit from the classes that were built during his practical work in computer lab to develop a bigger project.

D- General and transferable skills

d1) Deal with classes and objects.

d2) Deal with different approaches of programming (object-oriented programming – structured programming).

3. Contents

Topics		No. of		
Lectures	**Practical**	**Credit hours**	**lecture**	**practical**
Revision 1: - Pointers. - Pointers with (arrays, functions, structures). - Structures. - Debugging.	Debugging	3	2	2
Revision 2: - Functions (call by value and call by reference). - Overloading, default arguments. - Storage class specifier.	- Functions (call by value and call by reference). - Overloading, default arguments. - Storage class specifier.	3	2	2
Classes: - Class member access. - Constructor / Destructor.	Classes: - Class member access. - Constructor / Destructor.	3	2	2
Classes: - Overloading constructor functions. - Assigning objects. - Passing objects to functions. - This keyword.	Classes: - Overloading constructor functions. - Assigning objects. - Passing objects to functions. - This keyword.	3	2	2
Operator overloading: - Member functions. - Binary operators such as(+, -, *, /) - Unary operators such as(++, --, (),	Operator overloading: - Member functions. - Binary operators such as(+, -, *, /) - Unary operators such as(++, --, (),	3	2	2
Inheritance: - Overview about inheritance. - Protection for base class. - Discuss an example for inheritance.	Examples for inheritance	3	2	2

Inheritance: - Inheriting multiple base class. - Discuss an example to illustrate multiple classes.	Examples to illustrate multiple classes.	3	2	2
Polymorphism: - Pointers to derived types. - Virtual function. - Virtual base class. - Abstract classes.	Examples of Polymorphism	3	2	2
Files Input / Output: - Streams. - Stream classes.	How to read from and write into files	3	2	2
Templates and exception handling	How to use exception handling	3	2	2

4- Teaching and learning methods

- **Lectures**
- **discussion**
- **Assignments**
- **ELS**
- **labs**

5- Student assessment methods:

Assessment methods	To assess	ILOs	Week	Weight
Quiz 1		a1,a2,a3,b1,c1	4	5
Mid – term exam		a1,a2,a3,b1,c1,c2	8	25
Quiz 2		a1,a2,a3,a4,b1,b2,c1,c2,,d1	12	5%
Final practical exam		a1,a2,a3,a4,b1,b2,c1,c2,d1,d2	15	15%
Final written exam		All	16	50%

Total	100%

6- List of references

Essential books (textbooks)

- Balagurusamy, "Object Oriented Programming with C++", 6th edition, McGraw-Hill, @2013.

7- Facilities required for teaching and learning:

- **Data show**
- **Computer Lab**
- **Libraries**
- **White board**
- **labs**

8- COURSE MATRIX

Week No.	Topic	A-Knowledge & Understanding Skills				B- Intellectual Skills				C-Professional Skills				D-General & transferable Skills			
		a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	C3	C4	d1	d2	d3	d4
1	1- Review of structured programming concepts	√				√	√	√									
2	2- Review of basic data types	√				√					√						√
3	3- arrays and records	√				√				√				√			√
4	4- Abstract data types (ADT)	√	√											√	√		
5	5-Stacks and queues	√	√	√		√			√	√				√		√	√
6	6 - Linked lists		√	√				√	√			√		√			√
7	7- Recursion	√	√							√			√	√		√	√
8	Midterm Exam																
9	9- The Tower of Hanoi Problem	√	√					√			√			√		√	√
10	10- binary trees and binary search trees (BST)			√				√				√	√	√			
11	11. BST operations (Insert, delete and search)	√	√							√	√						√
12	12- Graphs	√					√	√		√							√

13	13- Graph traversal	√	√				√	√			√		√	√			
14	14- Minimum spanning trees			√	√	√			√	√							√
15	Revision																
16	Final Exam																

Course Coordinator: Dr. Mohmed Mead

Head of Department: Dr. Abdelaziz Mohmed

Date:

Course name: Computer Language-1

Code: CS112

Course Specifications

- **University:** Nahda (NUB)
- **Program(s) on which the course is given:** Computer Science
- **Department offering the programs:** Faculty of Computer Science
- **Department offering the course:** Computer Science
- **Academic year/level: Two**
- **Last date of specification approval: Spring 2021-2022**
-

1- Basic Information

- **Prerequisites**: CS101
- **Title:** Computer Language-1
- **Code:** CS112
- **Credit hours :3**
- **Lecture: 2**
- **Practical: 2**
- **Total:** 4

2- Professional Information:

1- Overall aim of the course

Upon completing this course, the student will have learned, through appropriate classroom and laboratory experiences, the following.

Describing syntax and semantics. Identifiers: names, binding, type checking, and scopes. Data types, subprograms and their implementation, concurrency, and programming paradigms such as declarative programming. Write a complete C++ program using the different statements of the C++ language.

2- Intended learning outcomes of course (ILOs):

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:

a1- Describe formal syntax and high-level semantics of a programming language.
a2- Explain and apply basic constructs and concepts used in common programming languages.
a3- Understand the fundamentals of programming language.
a4- Explain the object-oriented programming concepts.
a5- Learn about concurrency concepts and distributed programming.
a6- Explain and apply different programming language paradigms.
a7- Identify appropriate programming languages to use to address the specific needs of a stated problem.

b- Intellectual skills:

On successful completion of this course, the student should be able to:

b1- Think about Building computer programs.
b2- Build independent blocks or functions that can be used in other programs.

c- Professional and practical skills:

On successful completion of this course, the student should be able to:

c1-Plan, design, implement, and test computer programs and applications
c2- Familiarize with C++ programming language.
c3- Able to apply computer programming techniques to solve practical engineering problems.

d- General and transferable skills:

On successful completion of this course, the student should be able to:

d1- Analysis the problems by identifying the input, the output and relation between them.
d2- Present a design of algorithms (flowchart and pseudo code) for solving scientific problems related to other disciplines.
d3- Present a project or a product.
d4- Work in groups and within constraints.

3- Contents

Topics		No. of			ILOs
Lectures	Practical	Credit hours	Lecture	practical	
1- Describing Syntax and semantics	1-Describing syntax and semantics	3	2	2	a1-a3, b1-b2, c1-c3, d1-d2
2- Describing Syntax and semantics	2-Describing syntax and semantics	3	2	2	a1-a3, b1-b2, c1-c3, d1-d2
3-Identifiers: names, binding,	3-Identifiers: names, binding,	3	2	2	a1-a3, b1-b2, c1-c3, d1-d2

type checking, and scopes	type checking, and scopes				
4- Identifiers: names, binding, type checking, and scopes	4- Identifiers: names, binding, type checking, and scopes	3	2	2	a1-a3, b1-b2, c1-c3, d1-d2
5- Identifiers: names, binding, type checking, and scopes	5- Identifiers: names, binding, type checking, and scopes	3	2	2	a1-a3, b1-b2, c1-c3, d1-d2
6- Data types, subprograms, and their implementation	6- Data types, subprograms, and their implementation	3	2	2	a1-a3, a7, b1-b2, c1-c3, d1-d2
7- Data types, subprograms, and their implementation	7- Data types, subprograms, and their implementation	3	2	2	a1-a3, a7, b1-b2, c1-c3, d1-d2
8-Mid-Term					
8- concurrency, programming paradigms	8- concurrency, programming paradigms	3	2	2	a5
9- concurrency, programming paradigms	9- concurrency, programming paradigms	3	2	2	a5
10- concurrency, programming	10- concurrency, programming	3	2	2	a5

paradigms	paradigms				
11- Object-oriented programming	11- Object-oriented programming	3	2	2	a4, b1-b2, c1-c3, d1-d2
12- Object-oriented programming	12- Object-oriented programming	3	2	2	a4, b1-b2, c1-c3, d1-d2
13- component programming, parallel and distributed programming	13- component programming, parallel and distributed programming	3	2	2	a5-a6
14-component programming, parallel and distributed programming	14-component programming, parallel and distributed	3	2	2	a5-a6
15-Revision	15-Revision				a1-a7, b1-b2, c1-c3, d1-d2
16-Final Exam					

4- Teaching and learning methods

1- Lectures
2- Tutorials
3- Practical sections
4- Projects

5- Student assessment methods:

Assessment methods	To assess	ILOs	Week	Weight
Quiz 1		a1-a4, b1-b2, c1-c3, d1-d2	4	5
Midterm exam		a1-a3, a5, b1-b2, c1-c3, d1-d2	8	25
Quiz 2		a4, a5, b1-b2, c1-c3, d1-d2	12	5%
Final practical exam		a1-a7, b1-b2, c1-c3, d1-d2	15	15%
Final written exam		a1-a7, b1-b2, c1-c3, d1-d2	16	50%
Total				100%

6- List of references

- **Required Books**
  - Yinong Chen, "Introduction to Programming Languages: Programming in C, C++, Scheme, Prolog, C#, and Python" Kendall Hunt Publishing Company, 2020.
  - Harvey Deitel and Paul Deitel, "C++ How to Program", Pearson Education, 10th Edition 2017
- **Recommended Books**
- **Web Sites**

7- Facilities required for teaching and learning:

- A lecture hall equipped with projectors and computers.
- Tutorial rooms equipped with projectors and computers.
- Labs equipped with computers and software.
- A library

Week No.	A-Knowledge & Understanding Skills							B- Intellectual Skills		c-Professional Skills			D- General and transferable skills	
	a1	a2	a3	a4	a5	a6	a7	b1	b2	c1	c2	c3	d1	d2
1	√	√	√					√	√	√	√	√	√	√
2	√	√	√					√	√	√	√	√	√	√
3	√	√	√					√	√	√	√	√	√	√
4	√	√	√					√	√	√	√	√	√	√
5	√	√	√					√	√	√	√	√	√	√
6	√	√	√				√	√	√	√	√	√	√	√
7	√	√	√				√	√	√	√	√	√	√	√
8	Midterm Exam													
9					√									
10					√									

11				√				√	√	√	√	√	√	√
12				√				√	√	√	√	√	√	√
13				√	√			√	√				√	√
14				√	√			√	√				√	√
15	√	√	√	√	√	√	√	√	√	√	√	√	√	√
16	Final Exam													

Course Coordinator: Dr. Rabab Ali
Head of Department: Dr. Dr. Abdelaziz Mohmed
Date:

Course name: Operating System II

Code: CS402

Course Specifications

Program(s) on which the course is given: Computer Science

- **Department offering the programs:** faculty of Computer Science
- **Department offering the course:** Computer Science
- **Academic year / level: level Four**
- **Last date of specification approval: Fall 2021-2022**

A- Basic Information

- **Prerequisites**: CS215
- **Title:** Operating System II
- **Code:** CS402
- **Credit hours : 3**
- **Lecture: 2**
- **Practical: 2**
- **Total:**4

B- Professional Information:

1-Overall aim of the course

Upon completing this course the student will have learned, through appropriate classroom and laboratory experiences, the following:

i- Understating the main concepts of Concurrency, transactions, multimedia operating systems, real- time operating systems and mobile computing.
ii- Using principles gained in this class to understand problems in distributed systems.
iii- Developing practical skills needed for designing, augmenting and configuring an OS to be suitable for a particular deployment.
iv- To feel competent to design, augment and configure; distributed OS, Multimedia OS and mobile computing.

C- 2- Intended learning outcomes of course (ILOs):

By the end of the course the student must be able to:

A- Knowledge and understanding

On successful completion of the course, graduates should be able to:

a1. Study and explore the different types of operating systems, and understand file system concept and different access methods, directory and disk structure, file sharing and file-system mounting.

a2. Identify CPU scheduling and its different algorithms, and use different evaluation criteria.

a3. Finding the program critical section and its solution using the synchronization concept and solutions including mutex locks and semaphores.

a4. Using resource allocation graph to identify the deadlock and understand the different methods for handling deadlocks.

a5. Identify the general structure of distributed systems and the networks that interconnect them, and the communication protocols.

a6. Differentiate between protection in a computer system is as a mechanism for enforcement of policies governing resource use, and security that deals with threats and attacks using encryption, authentication, and hashing.

B- **Intellectual skills**

On successful completion of this course, graduates should be able to:

b1. Identify bottlenecks lie in the different types of operating systems.

b2. Recognize the differences between various types of operating systems.

b3. Perform comparisons between (algorithms, methods, techniques...etc).

b4. Identify attributes, components, relationships, patterns, main ideas, and errors.

b5. Assess criteria to measure the appropriateness of a computer system for its current deployment and future evolution, and to interpret the results thereof

C- **Professional and/or Practical skills**

On successful completion of this course, graduates should be able to:

c1. Use different types of operating systems.

c2. Specify, design, and implement some components of distributed operating systems.

c3. Evaluate operating systems in terms of general quality attributes and possible tradeoffs.

c4. Apply the principles of effective information management, information organization, and information-retrieval skills to distribute file systems.

c5. Identify any risks or safety aspects that may be involved in the operation of distributed systems

D- **General and transferable skills**

On successful completion of this course, graduates should be able to:

d1. Collaborate effectively within multidisciplinary team.

d2. Work in stressful environment and within constraints.

d3. Communicate effectively.

d4. Demonstrate efficient OS capabilities.

D- Contents

Topics		No. of Credit			ILO's
Lectures	**Practical**	**Credit hours**	**lecture**	**practical**	
1- Different types of operating systems: File systems and file concept	1- Type of OSs including multimedia, network, distributed and File systems concept	3	2	2	a1,a2,a3,,c3,c4, d3,d4
2-access methods	2- access methods	3	2	2	a1,a2, b3,b4, ,d4
3- directory systems	3- directory systems	3	2	2	b1,b2, c2,d2,d3
4-file protection	4- file protection.	3	2	2	a1 ,a3, b4,c1 ,d3,d4

5-Processes synchronization: Process Concept	5-Processes synchronization:Process Concept	3	2	2	a1,a2,a4,b1, d1,d4
6- the producer/consumer problem	6-the producer/consumer problem	3	2	2	a1,a2,c2,c3,c4
7- the critical section problem	7- the critical section problem	3	2	2	a1,a2,a3 ,d1,d4
8- Midterm Exam					a1,a2,a3, c4,c5,d1
9- semaphores, deadlock	9- semaphores, deadlock	3	2	2	a1,b4,c1,c2, d1
10- inter-process communications	10-inter-process communications	3	2	2	a1,a2,d3,d4
11-threads, language constructs	11-threads, language constructs	3	2	2	,b1,b2 ,c1,c2,c3,c4
12- Distributed operating systems:	12-Distributed operating systems:	3	2	2	a1 ,b3,b4,c1, d2,d3

distributed systems structures	distributed systems structures				
13- distributed file systems	13-distributed file systems	3	2	2	a1,a2, d2,d3
14-distributed coordination	14- distributed coordination	3	2	2	a1,a2, b2,b3,b4,c1
15- Protection and security	15- Protection and security	3	2	2	a1,b1,b3, d3,d4
16- Final Exam					a1,a2,a3,a4,b1,b2,b3,b4,c1,c2,c3 ,c4,c5,d1,d2,d3,d4

E- Teaching and learning methods

4.1 Lectures.
4.2 Tutorial exercise.
4.3 Practical Sessions.

F- Student assessment methods:

Assessment methods	T	ILOs	Week	Weight

Quiz 1		a1 ,a3 ,b2,b3, ,d4	3	15%
Quiz 2		a1,a3,a4,b1,c5,d1	5	
Quiz 3		a1,a2,d3,d4	10	
Mid – term exam		a1,a2,a3,c4,c5,d1	8	25%
Final practical exam		a1,c2,c3,c4,c5	14	10%
Final written exam		a1,a2,a3,a4,b1,b2,b3,b4,c1,c2,c3,c4,c5,d1,d2,d3,d4	16	50%
Total				100%

G- List of references

6.1 Required Books : (Textbooks)

A. Silberschatz, P. Galvin, and G. Gagne, "Operating System Concepts", John Wiley Publishing Company, 7th Edition, @2018.

6.2 Recommended Books

1- Tanenbaum, "Modern Operating Systems", Prentice Hall, Inc., 3th Edition, @2008.

6.3 Web Sites

Course homepage is accessed from the university e-learning website.

H- Facilities required for teaching and learning:

7.1 Lecture hall equipped with projectors and computers.

7.2 Tutorial rooms equipped with projectors and computers.

7.3 Labs equipped with computers and software.

7.4 Library.

I- COURSE MATRIX

Week No.	Topic	A-Knowledge & Understanding Skills				B- Intellectual Skills				C-Professional Skills				D-General & transferable Skills			
		a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	C3	C4	d1	d2	d3	d4
1	Different types of operating systems: File systems and file concept	√				√	√	√									
2	access methods	√				√					√						√
3	directory systems	√				√				√				√			√
4	file protection	√	√		√									√	√		
5	Processes synchronization: Process Concept	√	√			√			√	√				√		√	√
6	The producer/consumer problem			√				√	√			√		√			√
7	the critical section problem	√			√					√			√	√		√	√
8	Midterm Exam																

9	semaphores, deadlock	√	√					√			√			√		√	√
10	inter-process communications			√				√				√	√	√			
11	threads, language constructs	√	√		√					√	√				√		√
12	Distributed operating systems: distributed systems structures	√					√	√		√							√
13	distributed file systems	√	√				√	√			√		√	√			
14	Protection and security			√	√	√			√	√					√		√
15	Revision																
16	Final Exam																

Course Coordinator: Dr. Ahmed Youssef

Head of Department: Dr. Abdelaziz Mohmed

Date:

Course Name: Computer Networks -2
Code : CS313

Course Specifications

- **University: Nahda University (NUB)**
- **Program(s) on which the course is given:** Computer Science
- **Department offering the programs:** Faculty of Computer Science
- **Department offering the course:** Computer Science
- **Academic year / level:** Level three
- **Last date of specification approval: Spring 2021-2022**

1- Basic Information

- **Prerequisites**: CS305
- **Title:** Computer Networks -2
- **Code:** CS313
- **Credit hours** :3
- **Lecture:** 2
- **Practical:** 2
- **Total:** 3

2- Professional Information:

1- Overall aim of the course

Upon completing this course the student will have learned, through appropriate classroom and laboratory experiences, the following. Difference between LANs/MANs and WANS; Transmission media ; LAN/MANs topologies: Bus; Tree; Ring ; Star protocol Architecture; Logical link control (LLC); Medium access control (MAC)-LLC Services; LLC protocols ; Flow control ; Error control; Ethernet (IEEE 802.11,CSMA/CD); Frame Component- Mac protocol- 10 Mbps Ethernet (IEEE 802.11,CSMA/CD); Frame Component-MAC protocol- 10 Mbps Ethernet-100 Mbps Ethernet- Gigabit Ethernet; Token ring; Frame component-MAC protocol-Token priority-Token Maintenance;. FDDI: Frame component- MAC protocol- Token priority-Token Maintenance, Ring Maintenance; Internetworking: Bridge, Router.

2- Intended learning outcomes of course (ILOs):

By the end of the course the student must be able to cover the following outcomes:

a- Knowledge and understanding

a1- Demonstrate the understanding of protocols, transmission media, and layered architectures.

a2- Demonstrate the understanding of various network topologies.

a3- Understand how to find the routes by using different routing algorithms.

a4- Understand the basics of Internet.

b- Intellectual skills:

On successful completion of this course, the student should be able to:

b1 - Summarize the proposed solutions and their results in computer networks.

b2- Solve computer network problems with pressing commercial or industrial constraints

c- Professional and practical skills:

On successful completion of this course, the student should be able to:

C1- Apply sockets programming and implement client/server programs.
c2- Identify different protocols available in the network.

d- General and transferable skills:

On successful completion of this course, the student should be able to:

d1- Use text books to collect data.
d2- Work in groups to develop a project.
d3- Prepare short reports in certain topics of the course using Internet.

3- Contents

Topics		No. of			ILOs
Lectures	Practical	Credit hours	lecture	practical	
1- Definition and objectives	1- Definition and objectives	3	2	2	a1
2- Classifications, topologies	2- Classifications, topologies	3	2	2	a2
3- LANs/MANs and WANS Transmission media	3- LANs/MANs and WANS Transmission media	3	2	2	a1
4- LAN/MANs topologies	4- LAN/MANs topologies	3	2	2	a2
5- Logical link control (LLC)	5- Logical link control (LLC)	3	2	2	a1, c2
6- Ethernet (IEEE 802.11,CSMA/CD)	6- Ethernet (IEEE 802.11,CSMA/CD)	3	2	2	a1, c2
7- Frame Component- Mac protocol	7- Frame Component- Mac protocol	3	2	2	a1, c2
8-Mid-Term					
9-100 Mbps Ethernet	9-100 Mbps Ethernet	3	2	2	a1, c2
10- Gigabit Ethernet	10- Gigabit Ethernet	3	2	2	a1, c2

11- Token ring ; Frame component-MAC protocol	11- Token ring ; Frame component-MAC protocol	3	2	2	a1, c2
12- Token priority-Token Maintenance	12- Token priority-Token Maintenance	3	2	2	a1, c2
13- FDDI: Frame component	13- FDDI: Frame component	3	2	2	a1, c2
14- Internetworking: Bridge, Router	14- Internetworking: Bridge, Router	3	2	2	a3-a4
15-Revision	15-Revision	3	2	2	a1-a4, b1-b2
16-Final Exam					

4- Teaching and learning methods

- Lectures
- Tutorial Exercises
- Practical Sessions
- Assignments

5- Student assessment methods:

Assessment methods	To assess	ILOs	Week	Weight
Quiz 1		a1-a2, b1, c1, d1-d3	4	5
Mid – term exam		a1, b1-b2, c2, d3	8	25
Quiz 2		a1, b1-b2, c2, d1-d3	12	5%
Final practical exam		a1-a4, b1-b2, c1-c2	15	25%
Final written exam		a1-a4, b1-b2, c1-c2	16	40%
Total				100%

6- List of references

1. Required Books
   - Andrew S. Tanenbaum ,David J. Wetherall ,"Computer Networks" ,5th Edition,2012
2. Recommended Books cisco hand books
3. Web Sites

a. Course homepage is accessed from the university website

7- Facilities required for teaching and learning:

1-A lecture hall equipped with projectors and computers.
2- Tutorial rooms equipped with projectors and computers.
2-Labs equipped with computers and Internet facilities.
3-A library.

8- COURSE MATRIX

Week No.	Topic	A-Knowledge & Understanding Skills				B- Intellectual Skills		C-Professional Skills		D-General & transferable Skills	
		a1	a2	a3	a4	b1	b2	c1	c2	d1	d2
1	1- Definition and objectives	√				√		√			
2	2- Classifications, topologies	√				√		√			
3	3- LANs/MANs and WANS Transmission media		√			√		√			
4	4- LAN/MANs topologies		√						√		
5	5- Logical link control (LLC)			√		√			√	√	√
6	6- Ethernet (IEEE 802.11,CSMA/CD)			√		√			√	√	√
7	7- Frame Component- Mac protocol			√					√		
8		Midterm Exam									
9	9-100 Mbps Ethernet			√			√				
10	10- Gigabit Ethernet			√					√		
11	11- Token ring ; Frame component-MAC protocol			√					√		

12	12- Token priority-Token Maintenance				√				√		
13	13- FDDI: Frame component				√		√		√		
14	14- Internetworking: Bridge, Router				√		√			√	√
15	15-Revision	Revision									
16		Final Exam									

Course Coordinator: Dr. Dr. Ahmed Youssef
Head of Department: Dr. Abdelaziz Mohmed

Date: / /

Course name: Problem Solving Techniques

Code: IT308

Course Specifications

- **University:** Nahda (NUB)
- **Program(s) on which the course is given:** Computer Science
- **Department offering the programs:** Faculty of Computer Science
- **Department offering the course:** Computer Science
- **Academic year / level: Three**
- **Last date of specification approval: Spring 2021-2022**

1- Basic Information

- **Prerequisites**: CS203
- **Title:** Problem Solving Techniques
- **Code:** IT308
- **Credit hours : 3**
- **Lecture: 2**
- **Practical: 2**
- **Total:** 4

2- Professional Information:

1- Overall aim of the course

Upon completing this course the student will have learned, through appropriate classroom and laboratory experiences, the following.
Students will learn about the science and art of problem solving. The course will develop student's abilities to solve mathematics problems. The aim is foster the students' understanding that mathematics is a science of identifying, solving problems and generalizing. The course includes the description of main approaches to solving standard and challenge math problems. Students will learn strategies most widely used: pattern recognition, working backwards, guess and test, experimentation or simulation, reduction expansion, organized listing and exhaustive listing, logical deduction, mathematics induction, divide and conquer, writing equations, producing fruitful sketches.

2- Intended learning outcomes of course (ILOs):

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:

a1- Know the steps for solving problems.

a2- Understand the essential mathematics for problem solving relevant to computer science.

a3- Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics

a4- describe the main approaches to solving standard and challenge math problems

b- Intellectual skills:

On successful completion of this course, the student should be able to:

b1-Identify traditional and nontraditional information systems problems, set goals towards solving them and observe the results.

b3- Analyze the different types of algorithm paradigms for problem solving.

b3- Evaluate the performance of major algorithms for problem solving and classify them in terms of time and space.

b4- Establish algorithms for finding optimum solutions for real world problems.

c- Professional and practical skills:

On successful completion of this course, the student should be able to:

c1- Implement efficient algorithms to solve scientific problems.

c2- Design effective computer programs to solve a variety of scientific real-world problems.

c3- Design new algorithms or modify existing ones for new applications and reason about the efficiency of the result.

c4- Deploy effectively the tools used for the construction and documentation of software.

d- General and transferable skills:

On successful completion of this course, the student should be able to:

d1- Use effective computer programs for demonstrating efficient algorithms.

d2- Present a design of algorithms for solving scientific problems related to other disciplines.

d3- Present a project or a product.

d4 Work in groups and within constraints.

3- Contents

Topics		No. of			ILOs
Lectures	Practical	Credit hours	lecture	practical	
Introduction for the science and art of problem solving.	Introduction for the science and art of problem solving.	3	2	2	a1,c1,d1,d2
Introduction for the science and art of problem solving.	Introduction for the science and art of problem solving.	3	2	2	a1,c1,d1,d2
understanding that mathematics is a science of identifying, solving problems and generalizing.	understanding that mathematics is a science of identifying, solving problems and generalizing.	3	2	2	a1,a2,c1,d1,d2
science of identifying, solving problems and generalizing.	science of identifying, solving problems and generalizing.	3	2	2	a2,a3,b1,c1,d1,d2
science of identifying, solving problems and generalizing.	science of identifying, solving problems and generalizing.	3	2	2	a2,a3,b1,c1,d1,d2
description of main approaches to solving standard and challenge math problems.	description of main approaches to solving standard and challenge math problems.	3	2	2	a2,a3,b1,c1,c2,d1,d2
description of main approaches to solving standard and challenge math problems.	description of main approaches to solving standard and challenge math problems.	3	2	2	a2,a3,b1,c1,c2,d1,d2
8-Mid-Term					

strategies most widely used: pattern recognition, working backwards.	strategies most widely used: pattern recognition, working backwards.	3	2	2	a4,b2,b3,c1,c2,c3,d1,d2
strategies most widely used: pattern recognition, working backwards.	strategies most widely used: pattern recognition, working backwards.	3	2	2	a4,b2,b3, c1,c2,c3,d1,d2
strategies most widely used: pattern recognition, working backwards.	strategies most widely used: pattern recognition, working backwards.	3	2	2	a4,b2,b3, c1,c2,c3,d1,d2
strategies most widely used: pattern recognition, working backwards.	strategies most widely used: pattern recognition, working backwards.	3	2	2	a4,b2,b3c1,c2,c3,d1,d2,d3,d4
guess and test, experimentation or simulation, reduction expansion.	guess and test, experimentation or simulation, reduction expansion.	3	2	2	a4,b2,b3,b4,c1,c2,c3,c4,d1,d2
organized listing and exhaustive listing, logical deduction.	organized listing and exhaustive listing, logical deduction.	3	2	2	a4,b2,b3,b4,c1,c2,c3,c4,d1,d2
mathematics induction, divide and conquer, writing equations, producing fruitful sketches.	mathematics induction, divide and conquer, writing equations, producing fruitful sketches.	3	2	2	a4,b2,b3,b4,c1,c2,c3,c4,d1,d2
Final Exam					

4- Teaching and learning methods

1- **Lectures**
2- **Tutorials**
3- **Practical sections**
4- **Projects**

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5- Student assessment methods:

Assessment methods	ILOs	Week	Weight
Written exam	a1,a2,a3,a4,b1,b2,b3,b4,c1,c2,c3	16	50%
Practical exam	-	-	-
Oral exam	-	-	-
Mid-term exam	a1,a2,a3,b1,c1,c2	8	25%
Quiz_2	a4,b2,b3c1,c2,c3,d1,d2,d3,d4	12	10%
Quiz_1	a1,a2,c1,d1,d2	4	15%
Total			100%

6- List of references

- **Required Books**

  Walter Savitch , "Problem Solving With C++", Pearson Educational Inc., 10th Edition, 2018.

  T. H. Cormen, "Algorithms Unlocked," The MIT Press, 2013.

- **Recommended Books**

  T. H. Cormen, C. E. Leiseron, and C Stein, "Introduction to Algorithms," The MIT Press, 4th Edition, 2022.

- **Web Sites**

- Course homepage accessed from the university e-learning website.

7- Facilities required for teaching and learning:

- A lecture hall equipped with projectors and computers.
- Tutorial rooms equipped with projectors and computers.
- Labs equipped with computers and software.
- A library.

8- COURSE MATRIX

Week No.	Topic	A-Knowledge & Understanding Skills				B- Intellectual Skills				C-Professional Skills				D-General & transferable Skills			
		a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
1	Introduction for the science and art of problem solving.	√								√				√	√		
2	Introduction for the science and art of problem solving.	√								√				√	√		
3	understanding that mathematics is a science of identifying, solving problems and generalizing.	√	√							√				√	√		
4	science of identifying, solving problems and generalizing.		√	√		√				√				√	√		
5	science of identifying, solving problems and generalizing.		√	√		√				√				√	√		
6	description of main approaches to solving standard and challenge math problems.		√	√		√				√	√			√	√		
7	description of main approaches to solving standard and challenge math problems.		√	√		√				√	√			√	√		
8	Midterm Exam																
9	strategies most widely used: pattern recognition, working backwards.				√		√	√		√	√	√		√	√		
10	strategies most widely used: pattern recognition, working backwards.				√		√	√		√	√	√		√	√		

11	strategies most widely used: pattern recognition, working backwards.				√		√	√		√	√	√		√	√		
12	strategies most widely used: pattern recognition, working backwards.				√		√	√		√	√	√		√	√	√	√
13	guess and test, experimentation or simulation, reduction expansion.				√		√	√	√	√	√	√	√	√	√		
14	organized listing and exhaustive listing, logical deduction.				√		√	√	√	√	√	√	√	√	√		
15	mathematics induction, divide and conquer, writing equations, producing fruitful sketches.				√		√	√	√	√	√	√	√	√	√		
16	Final Exam																

Course Coordinator: Prof. Kamel Hussein Abdel Razik Rahouma
Head of Department: Dr. Abdelaziz Mohmed

Date:

Course name: Software Engineering-1

Code: CS304

Course Specifications

- **University: Nahda (NUB)**
- **Program(s) on which the course is given:** Computer Science
- **Department offering the programs:** faculty of Computer Science
- **Department offering the course:** Computer Science
- **Academic year / level: level Four**
- **Last date of specification approval: Spring 2021-2022**

A- Basic Information

- **Prerequisites: CS302**
- **Title: Software Engineering – 1**
- **Code:CS304**
- **Credit hours :3**
- **Lecture: 2**
- **Practical: 2**
- **Total:** 4

B- Professional Information:

1-Overall aim of the course

i. The skill with which we can apply engineering methods and tools will depend on the degree to which we have a clear and precise view of our objectives.

ii. In the realm of software engineering our objectives will always be stated in terms of desired properties of the resultant software.

iii. Four properties that are sufficiently general to be accepted as goals for the entire discipline of software engineering are modifiability, efficiency, reliability, and understandability.

C- Intended learning outcomes of course (ILOs):

By the end of the course the student must be able to:

A- Knowledge and understanding

a1- Use and explain the theory of computer science

a2-Discuss scientific and engineering practice and theory in computing and extend your knowledge through self-led study

a3-Identify requirements for specialized computing systems and propose solutions to fulfil them

a4- Use and, where appropriate, modify for specific use, established systems development methods

B- Intellectual skills

b1- Manage personal time

b2- Develop and critically evaluate specifications for specialist computer systems

b3- Analyze and abstract problems and propose and apply effective solutions

b4- Implement specialist computer systems from given specifications

b5- Analyze, evaluate and act upon descriptive documents

C- Professional and/or Practical skills

c1- Evaluate systems in terms of general quality attributes and possibletradeoffs presented within the given problem.

c2- Apply the principles of effective information acquisition, informationmanagement, organization, and information-retrieval to text, images, sound, and video.

c3- Apply the principles of human-computer interaction to the evaluation andconstruction of a wide range of materials including user interfaces, web pages, and multimedia systems.

c4- Identify any risks or safety aspects that may be involved in the operation ofcomputing equipment within a given context.

D- General and transferable skills

d1- Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension.

d2- Reveal communication skills, public speaking and presentation skills, and delegation, writing skills, oral delivery, and effectively using various media for a variety of audiences.

d3- Show the use of general computing facilities.

d4- Demonstrate an appreciation of the need to continue professional development in recognition of the requirement for life-long learning.

D-Contents

Topics		No. of			ILOs
Lectures	Practical	Credit hours	lecture	practical	
1- Overview of software engineering	1-Overview of software engineering	3	2	2	a1,a2,a3,b1,b2,b3,b4
2- Overview of software engineering	2-Overview of software engineering	3	2	2	a1,a3,a4,b1, ,c2,c3 ,d3,d4

3-Software requirement: requirement engineering processes.	3-Software requirement: requirement engineering processes.	3	2	2	c1,c2,c3,c4,d1,d2,d4
4- Software requirement: requirement engineering processes.	4-Software requirement: requirement engineering processes.	3	2	2	a1,a2,a3b2,b3,b4,b5,c1,c2
5 - system models	5- system models	3	2	2	a1,a2,a3,b2,b3,b4d2,d3,d4
6- system models	6- system models	3	2	2	a1,a2,a3,b1,b2,b3,b4,b
7- software prototyping	7- software prototyping	3	2	2	b1,b2,b3,b4,b5,c1,c2,c3
8-Midterm Exam					a1 ,a4,b1,b2,b3,b
9- Design: architecture design.	9- Design: architecture design.	3	2	2	a1,a2 ,b5,c1,c2,d2,d3,d4
10 - Design: architecture design.	10- Design: architecture design.	3	2	2	b5,c1,c2,c3,c4,d1,d2
11- Distributed system architecture	11- Distributed system architecture				a1,a2,a3,b3 ,c1,c2,c3,c4,
12- testing	12- testing	3	2	2	a4,b1,b2,b3,d4
13- implementation	13- implementation	3	2	2	a1,a2,a3,b3,b4,b5 ,d2,d3,d4
14- object oriented design	14- object oriented design	3	2	2	a1,a2,b3,b4,b5,c1,c2,c3,d2, d3,d4
15- Revision	15- Revision.	3	2	2	a1,a2,a3 ,c4,d1,d2
16- Final Exam					a1,a2,a3,a4,b1,b2,b3,b4,b5, c1,c2,c3,c4,d1,d2,d3,d4

E- Teaching and learning methods

1- Lectures
2- Tutorial exercise

3- Practical Sessions

F- Student assessment methods:

Assessment methods	Tools	ILOs	Week	Weight
Quiz 1	Tools	a1,a2,a3 ,b5,c1,c2,c3	3	20%
Quiz 2	Tools	a1,a2 ,b4,b5,c1,d3,d4	10	20%
Assignment		,a4,b1,b2,b3,b4, d1	5	5%
Mid – term exam		a1,a2, ,b2,b5,c1,	8	25%
Final written exam		a1,a2,a3,a4,b1,b2,b3,b4,b5,c1,c2,c3,c4,d1,d2,d3,d4	16	50%
Total				100%

G-List of references.

6.1 **Required Books (Textbooks)**

Software Engineering 10th Edition by Ian Sommerville , Pearson ,2014

Recommended Books

. Tanenbaum, "Modern Software Engineering"

", Prentice Hall, Inc.,Third Edition, 2008

6.2 Web Sites

Course homepage is accessed from the university e-learning website.

H- Facilities required for teaching and learning:

7-1 Lecture hall equipped with projectors and computers.

7-2 Tutorial rooms equipped with projectors and computers.

7-3 Labs equipped with computers and software.

7-4 Library.

I- COURSE MATRIX

Week No.	Topic	A-Knowledge & Understanding Skills				B- Intellectual Skills				C-Professional Skills				D-General & transferable Skills			
		a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	C3	C4	d1	d2	d3	d4
1	Overview of software engineering	√				√	√	√									
2	Software requirement: requirement engineering processes.	√				√					√						√
3	Software requirement: requirement engineering processes.	√				√				√				√			√
4	system models	√	√											√	√		
5	software prototyping	√				√			√	√				√		√	√
6	Design: architecture design.			√				√	√			√		√			√
7	Design: architecture design	√			√					√			√	√		√	√

8	Midterm																
9	Distributed system architecture	√	√					√			√			√		√	√
10	testing			√				√				√	√	√			
11	implementation	√	√							√	√						√
12	-object oriented design	√					√	√		√							√
13	Software requirement: requirement engineering processes.	√	√				√	√			√		√	√			
14	Software requirement: requirement engineering processes.			√	√	√			√	√							√
15	Revision																
16	Final Exam																

Course Coordinator: Dr. Mohmed Abdallah

Head of Department: **Dr. Abdelaziz Mohmed**

Date: