Course Title:	**Languages theory and compilation**
Course Code:	CSE211
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Naziha DHIBI
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **3 (2-1-0)**

2. Course type

a. College ☐ Department ■ Others ☐

b. Fundamental ■ Transversal ☐ Optional ☐

3. Level/year at which this course is offered: 1.2/3

4. Pre-requisites for this course : Computer architecture, Programming languages, Formal logic, Data structures and algorithms.

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	33	78
2	**Blended**	45		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	-
3	**Tutorial**	15
4	**Others** (specify)	-
	Total	45

B. Course Objectives and Learning Outcomes

Course Description

The course "Language theory and compilation " covers the fundamental notions in language theory, Need for Theory of Languages in the computer field. Allows students to acquire basic knowledge language theory and compilation allowing them to subsequently understand words, language, automata, grammars and compilation phases.

Course Main Objective

- ✓ Understand the different categories of programming languages, including high-level languages, intermediate languages, and low-level languages.
- ✓ Gain an in-depth understanding of formal grammars, automata, and regular, context-aware, and context-aware languages.
- ✓ Understand intermediate code optimization techniques, including local and global optimizations aimed at improving the efficiency of generated code.Master the compilation phases
- ✓ Be able to design the general structure of a compiler, taking into account the different compilation phases
- ✓ Be able to generate code optimized for specific hardware architectures.
- ✓ Ability to collaborate with other developers to create advanced build tools and solve complex problems.

1. Course Learning Outcomes

CLOs		Aligned PLOs
	Knowledge and Understanding	
1.1	✓ Understand the different categories of programming languages, including high-level languages, intermediate languages, and low-level languages.	PLOK.1
2.1	✓ Gain an in-depth understanding of formal grammars, automata, and regular, context-aware, and context-aware languages.	
3.1	✓ Understand intermediate code optimization techniques, including local and global optimizations aimed at improving the efficiency of generated code.Master the compilation phases	
	Skills	
2.1	✓ Be able to generate code optimized for specific hardware architectures.	PLOS.1
2.5	✓ Be able to design the general structure of a compiler, taking into account the different compilation phases	PLO.S5

C. Course Content

No	List of Topics	Contact Hours
1	Fundamental notions in language theory	3
2	Need for Theory of Languages in the computer field	3
3	Symbol and words	4
4	Language and operation on language	3
5	Regular expression and language	3
6	Finite Automata	6
7	Recognition of a word by an automaton	3
8	Notion of grammars	6
9	MidTerm-1	2
10	Link between deterministic finite Automata, regular grammar and language	4
11	The compilation phases	6
16	Final Exam	2
Total		45

Tutorials work Content

No	List of Topics	Contact Hours
1	Tutorial 1: Symbol, words, Regular expression and language	5
2	Tutorial 2: Finite Automata	4
3	Tutorial 3: Notion of grammars	4
4	Tutorial 4 : Compilation techniques : lexical analysis	3
5	Tutorial 5: Compilation techniques: syntactic and semantics analysis	4
Total		20

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**		
PLOK.1	✓ Understand the different categories of programming languages, including high-level languages, intermediate languages, and low-level languages. ✓ Gain an in-depth understanding of formal grammars, automata, and regular, context-aware, and context-aware languages. ✓ Understand intermediate code optimization techniques, including local and global optimizations aimed at improving the efficiency of generated	- Lecturing, Tutorial	- Assignments, Quizzes , Exams,

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
	code.Master the compilation phases		
2.0	**Skills**		
PLOS.1	✓ Be able to generate code optimized for specific hardware architectures.	- Lecturing, Tutorial	- Assignments, Quizzes , Exams,
PLO.S5	✓ Be able to design the general structure of a compiler, taking into account the different compilation phases		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	00%
2	Quizzes, Homework assignments	Random	00%
3	First mid Term	8	35%
4	Final Exam	16	65%

E. Student Academic Counselling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
- Office hours - Blackboard interface - Academic advisor - Bibliotic

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Christine Solnon, Language theory

2. Facilities Required

Item	Resources
Accommodation	**Classroom board**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**Graph Theory and optimization**
Course Code:	CSE212
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Naziha DHIBI
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: 3 (2-1-0)

2. Course type

a. College ☐ Department ■ Others ☐

b. Fundamental ■ Transversal ☐ Optional ☐

3. Level/year at which this course is offered: 1.2/3

4. Pre-requisites for this course : Discrete mathematics, algebraic theory

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	33	78
2	**Blended**	45		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22.5
2	**Laboratory/Studio**	-
3	**Tutorial**	22.5
4	**Others** (specify)	-
	Total	45

B. Course Objectives and Learning Outcomes

Course Description

The course "Graph Theory" covers the basic notions and concepts of graph theory, as well as the fundamental optimization algorithms to solve the shortest path problem and acquire basic knowledge of graph theory allowing them to subsequently understand the topological structures of computer networks and to apply search and optimization algorithms.

Course Main Objective

- ✓ Understand fundamental graph concepts such as vertices, edges, directed and undirected graphs, weighted graphs, etc.
- ✓ Know graph traversal algorithms such as depth-first search (DFS) and breadth-wise search (BFS), and their applications and have an understanding of basic optimization concepts, including optimization goals and constraints.
- ✓ Learn how to solve the problem of finding a shorter path by optimization algorithms.
- ✓ Master coloring and optimization problems on graphs, algorithms: minimum cost tree, maximum or minimum paths and solve central problem of scheduling.
- ✓ Present the transport networks, flows, circuits, separators; Ford-Fulkerson algorithms, Assignment problems, maximum couplings.
- ✓ Manage the design problems and ethics related to graphs theory with other disciplines

1. Course Learning Outcomes

	CLOs	AlignedPLOs
1	**Knowledge and Understanding**	
1.1	✓ Understand fundamental graph concepts such as vertices, edges, directed and undirected graphs, weighted graphs, etc.	PLOK.1
2.1	✓ Know graph traversal algorithms such as depth-first search (DFS) and breadth-wise search (BFS), and their applications and have an understanding of basic optimization concepts, including optimization goals and constraints.	
3.1	✓ Learn how to solve the problem of finding a shorter path by optimization algorithms.	
2	**Skills**	
1.1	✓ Master coloring and optimization problems on graphs, algorithms: minimum cost tree, maximum or minimum paths and solve central problem of scheduling	PLOS.1
2.1	✓ Present the transport networks, flows, circuits, separators; Ford-Fulkerson algorithms, Assignment problems, maximum couplings.	
1.5	✓ Manage the design problems and ethics related to graphs theory with other disciplines.	PLO.S5

C. Course Content

No	List of Topics	Contact Hours
1	Fundamental concepts of graph theory	2
2	Representation of a graph	1.5
3	Pathways and Connections	1.5
4	Hamiltonian graph concept	1.5
5	Coloring a graph: Welch-Powell algorithm	1.5
6	Tree course	1.5
7	Research problem: a tree of minimum weight	1.5
8	Kruskal's algorithm Prim's algorithm	1.5
9	MidTerm-1	2
10	Shorter path problem	1.5
11	Dijkstra algorithm, Bellman-Ford algorithm	2
12	The central problem of scheduling	2
13	The potential-Tasks graph, The potential steps graph (PERT)	1.5
14	Transport networks	1.5
15	Maximum flow problem	1.5
16	Final Exam	2
Total		22.5

Tutorial work Content

No	List of Topics	Contact Hours
1	Tutorial 1: Pathways and Connections	3
2	Tutorial 2: Eulerian graph, Welch-Powell algorithm	3.5
3	Tutorial 3: Kruskal's algorithm and Prim's algorithm to get tree of minimum weight	4
4	Tutorial 4: Dijkstra algorithm qnd Bellman-Ford algorithm for Shorter path problem	4
5	Tutorial 5: The potential-Tasks graph and the potential steps graph (PERT) for solving the central problem of scheduling	4
6	Tutorial 6: Ford-Fulkerson algorithm for solving the maximum flow problem	4
Total		22.5

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**		
PLO.K 1	✓ Understand fundamental graph concepts such as vertices, edges, directed and undirected graphs, weighted graphs, etc. ✓ Know graph traversal algorithms such as depth-first search (DFS) and breadth-wise search (BFS), and their applications. ✓ Have an understanding of basic optimization concepts, including optimization goals and constraints. ✓ Have in-depth knowledge of concepts related to flows and cuts in networks, as well as associated algorithms	- Lecturing - Tutorial - Class discussions	- Assignments, Quizzes , Exams,
2.0	**Skills**		
PLO.S1	✓ Be able to analyze the structure of a given graph, identify its specific properties and apply appropriate algorithms. ✓ Be proficient in using software tools to solve problems related to graphs and optimization	- Lecturing - Tutorial - Class discussions	- Assignments, Quizzes , Exams,
PLO.S6	✓ Apply learned skills to solve real-world problems such as network planning, project management and		

2. Assessment Tasks for Students

	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	00%
2	Quizzes, Homework assignments	-	0%
3	First mid Term	8	35%
4	Final Exam	16	65%

E. Student Academic Counselling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
- Office hours - Blackboard interface - Academic advisor - Bibliotic

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Christine Solnon, Graph theory and optimization in graphs
Essential References Materials	- Aimé Sache, The theory of graphs, University Press of France. - Lilia Horchani, graph algorithmic and optimization, ENSI, 2012. - Michel COUPRIE, Graphs and algorithms Written notes and exercises, 2017
Electronic Materials	- Lecture material in PPT - Any Related material including the YouTube videos relating to engineering measurement - Blackboard
Other Learning Materials	- NA

2. Facilities Required

Item	**Resources**
Accommodation	**Classroom board** **Computer lab with the necessary software** **Internet access**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**Object Oriented Programming**
Course Code:	CSE221
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Rim AFDHAL
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **4.5 (1.5-0-3)**

2. Course type

a. College ☐ Department ■ Others ☐

b. Fundamental ■ Transversal ☐ Optional ☐

3. Level/year at which this course is offered: 1.2/3

4. Pre-requisites for this course (if any): Practice of a programming language. Algorithm and data structures, programming workshop

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	52.5	120
2	**Blended**	45		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other (Project)**	22.5		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22.5
2	**Laboratory/Studio**	22.5
3	**Tutorial**	-
4	**Others** (Project)	22.5
	Total	

B. Course Objectives and Learning Outcomes

Course Description

This course is an introduction to object programming. We learn to identify objects and classes in a problem, as well as we learn to solve a problem through a set of interacting objects.
the integration of software components into a large-scale software architecture. Software development in this way represents the next logical step after learning coding fundamentals, allowing for the creation of sprawling programs.

Course Main Objective

- ✓ Understand the fundamentals of object-oriented programming, such as encapsulation, inheritance, polymorphism, and abstraction.
- ✓ Know the difference between classes and objects, and how to create classes and instantiate objects from those classes.
- ✓ Understand how to create class hierarchies through inheritance, and how to use polymorphy to deal with objects of different classes
- ✓ Know the use of object-oriented libraries and frameworks to accelerate development and reuse code.
- ✓ Be able to design software solutions using OOP principles, identifying necessary classes, relationships and behaviors.
- ✓ Apply OOP skills to analyze, design and implement complex applications using a modular approach.

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	✓ Understand the fundamentals of object-oriented programming, such as encapsulation, inheritance, polymorphy, and abstraction.	PLO.K1
1.2	✓ Know the difference between classes and objects, and how to create classes and instantiate objects from those classes.	
1.3	✓ Understand how to create class hierarchies through inheritance, and how to use polymorphy to deal with objects of different classes	
1.4	✓ Know the use of object-oriented libraries and frameworks to accelerate development and reuse code.	
2	**Skills**	
2.2	✓ Be able to design software solutions using OOP principles, identifying necessary classes, relationships and behaviors.	PLO.S2
2.7	✓ Apply OOP skills to analyze, design and implement complex applications using a modular approach.	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	- Fundamental concepts of the object paradigm (objects, classes, attributes and methods, ...)	2
2	- General introduction to Java: - Introduce the Java language, - Introduce the JDK, - Detail the general structure of a Java application - Writing arguments to the command line	2
3	- The basic elements of the Java language: - Comments and identifiers in Java - Data types - Control structures - Reference types	3
4	- Principles of object-oriented programming: - Classes and objects - The builders - References and destruction of objects - Packages - Encapsulation and visibility levels - Accessors - Characteristics of attributes and methods	3
5	- Inheritance - Constructors and inheritance - The redefinition of methods - The redefinition of attributes - The keywords super and final - Type compatibility	3
6	- Polymorphism - Abstract classes - Interfaces - Genericity	3
7	- Exception handling: - Exceptional objects - The keywords try, catch and finally	3
8	- Exception handling - The multi catch	2
9	- The throw and throws keywords - Interception vs Spread - Exception checked/unchecked	1.5
Total		22.5

Practical work Content

No	List of Topics	Contact Hours
1	Classes and objects	9
2	Inheritance Polymorphism and Abstract class	9
3	Interface	9
4	Graphic Interface	9
5	Application with Java	9
Total		45

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**		
PLO.K1	✓ Understand the fundamentals of object-oriented programming, such as encapsulation, inheritance, polymorphism, and abstraction. ✓ Know the difference between classes and objects, and how to create classes and instantiate objects from those classes. ✓ Understand how to create class hierarchies through inheritance, and how to use polymorphy to deal with objects of different classes ✓ Know the use of object-oriented libraries and frameworks to accelerate development and reuse code.	- Lecturing	- Assignments, Quizzes , Exams,
2.0	**Skills**		
PLO.S1	✓ Be able to design software solutions using OOP principles, identifying necessary classes, relationships and behaviors.	- Lecturing	- Assignments, Quizzes , Exams,

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
PLO.S7	✓ Apply OOP skills to analyze, design and implement complex applications using a modular approach.	- Lecturing	- Assignments, Quizzes , Exams,

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (final evaluation project)	-	25%
2	Quizzes, Homework assignments	-	-
3	First mid Term	8	25%
4	Final Exam	16	50%

E. Student Academic Counselling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
- Office hours - Blackboard interface - Academic advisor - Bibliotic

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- La programmation orientée objet by Released July 2011 Publisher(s): Eyrolles ISBN: 9782212128062
Essential References Materials	- https://www.emse.fr/~picard/cours/1A/java/livretJava.pdf - https://members.loria.fr/goster/files/teaching/oop/OOP-CM1-classroom.pdf
Electronic Materials	- Lecture material in PPT - Any Related material including the YouTube videos relating to engineering measurement - Blackboard
Other Learning Materials	- NA

2. **Facilities Required**

Item	Resources
Accommodation	**Classroom board** **Computer lab with the necessary software** **Internet access**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**Web and multimedia programming**
Course Code:	CSE222
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Mrs. MOUNA HLIMA
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **3 (0-0-3)**
2. Course type **a.** College ☐ Department ■ Others ☐ **b.** Fundamental ■ Transversal ☐ Optional ☐
3. Level/year at which this course is offered: 1.2/3
4. Pre-requisites for this course (if any):
5. Co-requisites for this course (if any)**:** None

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	30	55
2	**Blended**	22.5		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other (Project)**	22.5		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	-
2	**Laboratory/Studio**	22.5
3	**Tutorial**	-
4	**Others** (Project)	22.5
	Total	45

B. Course Objectives and Learning Outcomes

Course Description

This course contains an introduction to programming and computer science with an emphasis on the development of multimedia applications.
The course introduces the fundamental principles of programming, including object-oriented and event-driven programming.
Students will develop an understanding of how to use and create classes and methods and combine them with multimedia libraries to produce animations, handle input from keyboard and mouse, and import sounds and videos to produce multimedia applications which can be directly deployed on the Internet.
Multimedia Web Programming covers the main technologies and techniques of client-side web development, with an emphasis on graphics and multimedia interface programming.
This course gives an introduction to the Angular framework

Course Main Objective

- ✓ The objective of this module is to familiarize students with HTML, CSS, and JavaScript programming
- ✓ Introducing main Scripting and Common Programming Concepts
- ✓ Preparing Angular framework (installing programming environments such as Visual studio code and NodeJS)
- ✓ Understanding JavaScript Operators, Expressions, alerts, and Prompts
- ✓ Understanding JavaScript Keywords and Reserved Words
- ✓ Understanding Functions, Methods, Exceptions, and Events in JavaScript
- ✓ Understanding Controlling Decisional Program Flow
- ✓ Installing dependencies of the angular framework
- ✓ Building an Angular application with the CLI
- ✓ Setting the stage for Angular
- ✓ Building components
- ✓ Learning how to react to events
- ✓ Adding custom properties
- ✓ Structuring a document with guidelines

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	✓ Know essential web technologies such as HTML, CSS and JavaScript and their role in creating interactive web pages.	PLOK.1
1.2	✓ Understand HTML structure and tags, and how to create a consistent and semantic layout.	
1.3	✓ Know the basics of JavaScript programming, including variables, functions, loops, and conditionals.	
2	**Skills**	
2.1	✓ Have the skill to debug common issues related to web development and multimedia integration	PLOS2
2.2	✓ Be able to create a static web page using HTML and CSS to format and structure content. ✓ Be able to design attractive and relevant multimedia elements for a web page, using graphic design software.	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to HTML, CSS, and JavaScript	8.5
2	Introduction to Typescript	3
3	Visual Studio Code and NodeJS: Explore and install Cli dependencies to prepare Angular framework	3
4	Building components and learning how to react to events	5
5	Adding custom properties and structuring a document with guidelines	3
Total		22.5

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**		
PLO.K1	✓ Know essential web technologies such as HTML, CSS and JavaScript and their role in creating interactive web pages. ✓ Understand HTML structure and tags, and how to create a consistent and semantic layout. ✓ Know the basics of JavaScript programming, including variables, functions, loops, and conditionals.	- Lecturing - Class discussions - projects	- Assignments, Quizzes - Report - Exam
2.0	**Skills**		
PLO.S2	✓ Have the skill to debug common issues related to web development and multimedia integration	- Lecturing - Class discussions - projects	- Assignments, Quizzes - Report - Exam
PLO.S7	✓ Be able to create a static web page using HTML and CSS to format and structure content. ✓ Be able to design attractive and relevant multimedia elements for a web page, using graphic design software.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Monthly	25%
2	Quizzes, Homework assignments	Random	25%
3	First mid Term	-	00%
5	Final Exam(Project)	16	50%

E. Student Academic Counselling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
- Office hours - Blackboard interface - Academic advisor - Bibliotic

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Angular Development with TypeScript - Yakov Fain and Anton Moiseev - Pro Angular 9: Build Powerful and Dynamic Web Apps Adam Freeman
Essential References Materials	
Electronic Materials	- Lecture material in PPT - PC - Any Related material including the YouTube videos relating to image and signal processing - Blackboard - Collaboratory Software
Other Learning Materials	- NA

2. Facilities Required

Item	**Resources**
Accommodation	**Classroom board** **Computer lab with the necessary software** **Internet access**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	**Evaluators**	**Evaluation Methods**
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**Preparing for LPI 101 certification**
Course Code:	CSE231
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Thouraya GOUASMI
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **1.5(0-0-1.5)**

2. Course type

a. University ☐ College ☐ Department ■ Others ☐

b. Required ■ Elective ☐

3. Level/year at which this course is offered: 1.2/3

4. Pre-requisites for this course : digital circuits, Data structure, operating system (OS)

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	15	37.5
2	**Blended**	22.5		
3	**E-learning**	…..		
4	**Distance learning**	…..		
5	**Other(Specify)**	…..		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	-
2	**Laboratory/Studio**	22.5
3	**Tutorial**	-
4	**Others**(specify)	-
	Total	22.5

B. Course Objectives and Learning Outcomes

Course Description

The LPI 101 Certification Prep Course is a comprehensive training course designed to help students effectively prepare for the LPI 101 certification exam, also known as Linux Professional Institute Certification 101. This course aims to provide an in-depth understanding of the skills and knowledge needed to pass this certification exam.

Course Main Objective

Students will be able to:

- ✓ Recognize the hardware: PCI / USB ports, BIOS settings for booting, physical addresses (IRQ, DMA)
- ✓ Know how to install and configure a GNU/Linux system on a PC type workstation.
- ✓ Know how to use system run levels (shutdown, restart, single and multi-user)
- ✓ Know how to install and uninstall programs on RedHat or Debian family distributions, and manage shared libraries.
- ✓ Understand the basics of the command line (Bash, vi)
- ✓ Manage common disks, partitions and file systems (including quotas)
- ✓ Understand file management: permissions and properties, search and links

1. Course Learning Outcomes

	CLOs	AlignedPLOs
1	**Knowledge and Understanding**	
1.1	✓ Recognize the hardware: PCI / USB ports, BIOS settingsfor booting, physical addresses (IRQ, DMA)	PLO.K1
1.2	✓ Know how to install and configure a GNU/Linux system on a PC type workstation	
1.3	✓ Know how to use system runlevels (shutdown, restart, single and multi-user)	
1.4	✓ Know how to install and uninstall programs on RedHat or Debian family distributions, and manage shared libraries	
1.5	✓ Understand the basics of the command line (Bash, vi)	
	✓ Understand file management: permissions and properties, search and links	
2	**Skills**	
2.1	✓ Students will develop diagnostic and problem-solving skills to effectively identify and resolve common problems encountered on Linux systems.	PLO.S1
2.2	✓ Manage common disks, partitions and file systems (including quotas)	PLO.S6

C. Course Content

No	List of Topics	Contact Hours
1	**I. System Architecture** 1- material 2- start 3- levels of execution	4,5
2	**II. Installing and managing packages** 1- partitioning scheme 2- startup managers 3- shared libraries 4- Debian package manager 5- RPM and YUM	6
3	III. The Linux command line 1- the shell 2- text flow processing 3- file management 4- streams, pipes and redirects 5- process management and priorities 6- regular expressions	6
4	IV. Disks, file systems and FHS 1- partitions and file systems 2- integrity of file systems 3- mount / unmounts file systems 4- quota 5- permissions and owners 6- links 7-file search	6
Total		22.5

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**		
K.1	✓ Recognize the hardware: PCI / USB ports, BIOS settings for booting, physical addresses (IRQ, DMA) ✓ Know how to install and configure a GNU/Linux system on a PC type workstation ✓ Know how to use system runlevels (shutdown, restart, single and multi-user) ✓ Know how to install and uninstall programs on RedHat or Debian family	- Lecturing - Class discussion - Labdemonstration - Class discussion	Assignments, Quizzes , Exams,

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	distributions, and manage shared libraries ✓ Understand the basics of the command line (Bash, vi) ✓ Understand file management: permissions and properties, search and links		
2.0	**Skills**		
S.1	✓ Students will develop diagnostic and problem-solving skills to effectively identify and resolve common problems encountered on Linux systems.	- Lecturing - Lab demonstration - Class discussion	Assignments, report, Quizzes , Exams,
	✓ Manage common disks, partitions and file systems (including quotas)	- Lecturing - Labdemonstration - Class discussion	Assignments, Report, Quizzes , Exams

2. Assessment Tasks for Students

#	Assessmenttask*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	00%
2	Quizzes, Homework assignments	Random	00%
3	First midterm	8	00%
4	Final Exam	16	100%

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
1- Office hours 2- Blackboard interface

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1. Sébastien ROHAUT, « Préparation à la certification LPIC-1 », Examens LPI 101 et LPI 102, 5ème édition 2017 ,838 pages. 2. Kay A. ROBBINS, S. ROBBINS. UNIX Systems Programming: Communication, Concurrency and Threads, 2003, Prentice-Hall. 3. W. RICHARD STEVENS, Stephen A. RAGO. Advanced Programming in the UNIX Environment, 2nd Edition, 2005, Addison-Wesley. 4. A. SILBERSCHATZ, P. GALVIN, G. GAGNE. Operating System Concepts. International Student Version, 8th Edition, Wiley, February 2009. 5. A. SILBERSCHATZ, P. GALVIN, G. GAGNE. Operating System Concepts with Java, 8th Edition, Wiley, February 2010. 6. Andrew S. TANENBAUM. Systèmes d'exploitation, 3ème édition, Octobre 2008, Edition Pearson Education.

	7. U. RAMACHANDRAN, William D. LEAHY Jr. Computer Systems: An Integrated Approach to Architecture and Operating Systems, First Edition, July 2010, Addison Wesley. 8. A. Tanenbaum. Modern Operating Systems, 1992, Computer Science 9. Benoît Semelin, « Astrophysique et instrumentations associées ». Cours UNIX,2006
Essential References Materials	1. https://www.eyrolles.com/Informatique/Theme/239/theories-des-systemes-d-exploitation/ 2. https://www.bestcours.com/systeme-exploitation/ 3. http://www.advancedlinuxprogramming.com/alp-folder **4. https://www.lpi.org/our-certifications/lpic-1-overview**
Electronic Materials	● Lecture material in PPT ● Any Related material including the YouTube videos relating to engineering measurement ● Blackboard
Other Learning Materials	NA

2. Facilities Required

Item	Resources
Accommodation	**Classroom board** **Computer lab with the necessary software** **Internet access**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**Preparing for the CCNA1 certification**
Course Code:	CSE232
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Mr. Mounir Telli
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: 3 (1.5-0-1.5)

2. Course type

a. College ☐ Department ■ Others ☐

b. Fundamental ■ Transversal ☐ Optional ☐

3. Level/year at which this course is offered: 1.2/3

4. Pre-requisites for this course (if any): Knowledge of protocol layering, General knowledge of TCP/IP protocols

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	34.5	79.5
2	**Blended**	45		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other (Specify)**			

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22.5
2	**Laboratory/Studio**	22.5
3	**Tutorial**	
4	**Others** (specify)	-
	Total	45

B. Course Objectives and Learning Outcomes

Course Description

The CCNA1, or Cisco Certified Network Associate - Part 1, course is essential training for obtaining the necessary skills and knowledge of fundamental networking and prepare for the Cisco Certified Network Associate (CCNA) certification. This course is the first module in a series of CCNA courses aimed at deepening the understanding of computer networks.

Course Main Objective

- ✓ Understand the essential principles of IP protocols, their uses as well as IP addressing.
- ✓ Know the advanced protocols implementing IP mechanisms. These protocols are seen from the IP perspective.
- ✓ Students will learn practical skills to configure and manage network devices, such as Cisco routers and switches
- ✓ The whole course emphasizes the importance of the basic mechanism and the general principles on which all network mechanisms are based

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	✓ Understand the essential principles of IP protocols, their uses as well as IP addressing	PLO.K1
1.2	✓ Know the advanced protocols implementing IP mechanisms. These protocols are seen from the IP perspective.	
2	**Skills**	
2.1	✓ Students will learn practical skills to configure and manage network devices, such as Cisco routers and switches	PLO.S.1
	✓ The whole course insists on the importance of the basic mechanism and on the general principles on which all network mechanisms are based.	PLO.S5

C. Course Content

No	List of Topics	Contact Hours
1	**Chapter 1: Introduction to Local Area Networks**	5
	1. Definitions	
	2. Types of networks	
	3. Topologies	
	4. How to transmit information on a network?	
	5. How a network works	
	6. The benefits of networks	
	7. Network software	
	8. OSI and TCP/IP reference models	
2	**Chapter 2: Physical layer**	
	1. Role of the Physical Layer	

	2. Diagram of an ETTD and ETCD data circuit	8
	3. Transmission techniques	
	4. Modes of transmission	
	5. Multiplexing	
	6. Transmission medium and network access media	
3	**Chapter 3: Link layer and Data Transmission**	8
	○ Sharing a transmission channel.	
	○ Machine addressing	
	○ Error detection and correction	
	○ Reliable data transfer and flow control	
	○ Different link layer technologies (ethernet, token ring, FDDI)	
4	**Chapter 4: Network layer and IP addressing**	9
	1. Network Layer Function	
	2. The IP protocol: Internet Addressing	
	3. The Sub-addressing	
	4. The ARP protocol: Address Resolution Protocol	
	5. RARP: Reverse Address Resolution Protocol	
	6. IP: Internet Protocol (the datagram)	
	7. Datagram Routing	
	Practical workshops	**15**
	Practical workshop: Introduction to local networks ***Practical workshop: Computer network simulation*** ***Practical workshop: Build and use a network*** ***Practical workshop: Configure and administer a network***	
Total		**67.5**

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**		
K.1	✓ Understand the essential principles of IP protocols, their uses as well as IP addressing ✓ Know the advanced protocols implementing IP mechanisms. These protocols are seen from the IP perspective.	- Lecturing - Class discussion - work in group	- Assignments, Quizzes, Exams,
2.0	**Skills**		
	✓ Students will learn practical skills to configure and manage network	- Lecturing - Practice Projects	- Assignments, Quizzes, Exams,

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	devices, such as Cisco routers and switches	- work in group	- Assignments, Report, Quizzes, Exams, report
	✓ The whole course insists on the importance of the basic mechanism and on the general principles on which all network mechanisms are based.		

2. Assessment Tasks for Students

	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	25%
2	Quizzes, Homework assignments	-	-
3	mid Term	8	25%
4	Final Exam	16	50%

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
- Office hours - Blackboard interface - Academic advisor - Bibliotic

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Local Area Network Reference (McGraw-Hill Communications Series) 1st. Edition (1989) - J. F. Kurose and W. R. Ross, *Computer Networking: A Top-Down Approach Featuring the Internet.* 7th Edition (2016) - Technologies des ordinateurs et des réseaux, cours et exercices corrigés ; Pierre-Alain Goupille ; 6ème édition, Dunod - Réseaux locaux ; G.Beuchot ; polycopiés
Essential References Materials	- CCNA 200-301 Official Cert Guide Library
Electronic Materials	- PPT - PC - Cables, hubs, switches, and routers - YouTube videos relating to LAN - Blackboard
Other Learning Materials	- NA

2. Facilities Required

Item	Resources
Accommodation	**Classroom board** **Computer lab with the necessary software** **Internet access**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**Digital Transmission**
Course Code:	CSE241
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	DR. Malek Ferhi
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **3 (1.5-0.5-1)**

2. Course type

a. College ☐ Department ■ Others ☐

b. Fundamental ■ Transversal ☐ Optional ☐

3. Level/year at which this course is offered: 1.2/3

4. Pre-requisites for this course (if any): **CSE122**

5. Co-requisites for this course (if any)**:** **CSE572/2**

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	33	78
2	**Blended**	30		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other (Project)**	15		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	20
2	**Laboratory/Studio**	15
3	**Tutorial**	10
4	**Others** (specify)	-
	Total	45

B. Course Objectives and Learning Outcomes

Course Description

The course covers the basic notions of data transmission, and focuses on the first two layers of the OSI model, namely the physical layer and the data link layer learning and analyzing the entire chain of digital communication, different transmission medium characteristics and the settings conditions of transmission possibilities in terms of bit rates and distance that can be covered with different digital techniques of modulation.

Course Main Objective

- ✓ Digital conversion of analog information.
- ✓ Analyze the advantages and disadvantages of the different modes of transmission.
- ✓ Acquire the fundamental and theorical knowledge allowing the functionally specify.
- ✓ Learning the different faults of transmission medium
- ✓ design and analyze an entire chain of digital communications
- ✓ Master the techniques of digital modulation.

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and understanding**	
1.1	✓ Master the basic elements used in signal processing, particularly in the technique of data transmission.	PLO.K1
2	**Skills**	
2.1	✓ Apply the fundamental and theoretical knowledge allowing to functionally specify, design and analyze an entire chain of digital communication.	PLO.S1
3.1	✓ The ability to use the acquired skills in digital transmission to solve real problems related to telecommunication and to use them in the development of this field	PLO.S5

C. Course Content

No	List of Topics	Contact Hours
1	Chapter 1 : Analog/Digital Converters 1- the analog domain 2- the numerical domain 3- The applications of an analog digital converter: 4- The steps of analog to digital conversion (digitization) ● Sampling: ● Sampling theorem: Shannon's theorem: ● Quantize: ● signal-to-noise quantization - Linear quantization - Coding of values: 5- The characteristics of an analog-digital converter:	9

No	List of Topics	Contact Hours
	6 - The different types of analog-digital converters: Analog ramp converter: ● Serial converters: ● Successive weighing converters: ● Sigma delta converter	
2	Chapter 2 Digital Communication Chain 1 communication channel 2 Modules of the communication chain 3 Messages and signal s inthecommunication chain 4 Transmission rate	9
4	Chapter 3 Baseband Transmission 1. Chain architecture. 2. Flow of data to be transmitted. 3. Source Coding 4. Disturbances introduced by the Transmission Channel 5.Transmission media. 6.Recovery of transmitted data	9
5	Chapter 4: Digital modulations 1. Amplitude shift keying (ASK) 2. Phase shift keying (PSK) 3. Amplitude and phase shift modulations (APSK) 4. Frequency shift keying (FSK) 5. FSK and CPFSK6 modulations. MSK-modulation	9
6	PRATICAL WORKS TD1: Digital transmission with correction TD2: Optical fiber with correction	
7	lab 1: SIMULINK MATLAB INITIALIZATION lab 2: simulink for digital transmission lab 3: baseband modulation lab4: digital modulation modulation	9
Total		45

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**		
PLOK.1	Master the basic elements used in signal processing, particularly in the technique of data transmission.	-Lecturing - Class discussions	Exams,
2.0	**Skills**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
PLO.S1	Apply the fundamental and theoretical knowledge allowing to functionally specify design and analyze an entire chain of digital communication.	-Lecturing - Class discussions	Assignments, Report, Exams,
PLO.S5	The ability to use the acquired skills in digital transmission to solve real problems related to telecommunication and to use them in the development of this field	- Lectures - Class discussions - Assignments - projects	Assignments, Report, Exams

2. Assessment Tasks for Students

	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Monthly	15%
2	Quizzes, Homework assignments	Random	10%
3	First mid Term	8	25%
4	Final Exam	16	50%

E. Student Academic Counselling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
- Office hours - Blackboard interface - Academic advisor - Bibliotic

F. Learning Resources and Facilities

1. .Learning Resources

Required Textbooks	– Guy Pujolle "Les Réseaux" édition 2003 EYROLLES – Guy Pujolle. "Cours. Réseaux. Télécoms. Avec exercices corrigés" 3ème edition – EYROLLES
Essential References Materials	MATLAB
Electronic Materials	– Lecture material in PPT – PC – Blackboard
Other Learning Materials	NA

2. Facilities Required

Item	Resources
Accommodation	**Classroom board** **Computer lab with the necessary software** **Internet access**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**Architecture & micro processors**
Course Code:	CSE242
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Oussama BOUFARES
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

Course Identification

1. Credit hours: **3 (1.25-1-0.75)**

2. Course type

a. College ☐ Department ■ Others ☐

b. Fundamental ■ Transversal ☐ Optional ☐

3. Level/year at which this course is offered: 1.2/3

4. Pre-requisites for this course (if any): DIGITAL CIRCUITS, DATA STRUCTURE

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	33	78
2	**Blended**	45		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	20
2	**Laboratory/Studio**	15
3	**Tutorial**	15
4	**Others** (specify)	-
	Total	45

A. Course Objectives and Learning Outcomes

Course Description

The Computer Architecture and 8086 Microprocessor course is an essential subject for computer science and computer engineering students. This course aims to provide an in-depth understanding of computer architecture and how it works, with an emphasis on the 8086 microprocessor, which played a major role in the computer industry. Students will learn the fundamental concepts of the internal organization of a computer, including registers, data and address buses, and memory organization. They will also study the 8086 instruction set, addressing modes and assembler programming. The course will also cover interrupts, I/O, and different modes of operation of the 8086. Through case studies and hands-on projects, students will apply their knowledge to solve real-world problems and deepen their understanding of the architecture of the 8086 microprocessor.

Course Main Objective

- ✓ Understand the fundamentals of computer architecture, including key components and their interconnection, in order to develop a holistic view of how a computer system works.
- ✓ Acquire an in-depth knowledge of the architecture of the 8086 microprocessor, including its internal structure, registers, instruction set, and modes of operation, to be able to program and operate this microprocessor effectively.
- ✓ Master assembly programming techniques for the 8086 microprocessor, understanding instruction formats, addressing modes and coding conventions, in order to be able to develop efficient and optimized programs.
- ✓ Understand memory management mechanisms, including the segmented organization of the 8086 and the concepts of segmentation and paging, to be able to effectively manage memory in programs and operating systems.
- ✓ Learn how to handle hardware and software interrupts, as well as use input/output instructions, to enable interaction with external devices and asynchronous event handling.
- ✓ Develop analytical and problem-solving skills by engaging with case studies and hands-on projects that apply computer and 8086 microprocessor architecture concepts to real-world problems, reinforcing practical understanding and application of learned knowledge.

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	✓ Understand the fundamentals of computer architecture, including key components and their interconnection, in order to develop a holistic view of how a computer system works.	PLO.K1
	✓ Acquire an in-depth knowledge of the architecture of the 8086 microprocessor, including its internal structure, registers, instruction set, and modes of operation, to be able to program and operate this microprocessor effectively.	
2	**Skills**	
2.1	✓ Master assembly programming techniques for the 8086 microprocessor, understanding instruction formats, addressing modes and coding conventions, in order to be able to develop efficient and optimized programs.	PLO.S2
2.2	✓ Develop analytical and problem-solving skills by engaging with case studies and hands-on projects that apply computer and 8086 microprocessor architecture concepts to real-world problems, reinforcing practical understanding and application of learned knowledge.	PLO.S7

B. Course Content

No	List of Topics	Contact Hours
1	➢ **Course:** Chapter 0: Basic Architecture of computer - Von Neumann model. - The central unit. - Main memory. - Input/output interfaces. - Buses. - Address decoding	8.5
2	➢ **Course:** Chapter 1 - Memories - The microprocessor - Basic architecture of a microprocessor - Execution cycle of an instruction. - Instruction set (definition, instruction type, coding, addressing mode) - Concept of RISC and CISC architecture.	10
3	➢ **Course:** Chapter 2: THE INTEL 8086 MICROPROCESSOR - Architecture du 8086 - Jeux d'instructions et modes d'adressage - Interfaces d'entrée-sortie - Quelques aperçus sur le processeur 8086	7.5
4	➢ **Course:** Chapter3: La programmation en assembleur pour le microprocesseur 8086	7

	- Les conventions de codage en assembleur pour le 8086 - Exemples de programmes simples en assembleur pour illustrer les concepts clés	
	➢ **Practical content:** - LAB1: Introduction to using the TASM programming environment - LAB2: Register manipulation and memory addressing - LAB3: Table manipulation - LAB4: Conditional and unconditional structure	12
Total		45

C. 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**		
PLO.K1	✓ Understand the fundamentals of computer architecture, including key components and their interconnection, in order to develop a holistic view of how a computer system works.	- Lectures - Tutorials	- Course project report & presentation - Written exams - homework
PLO.K2	✓ Acquire an in-depth knowledge of the architecture of the 8086 microprocessor, including its internal structure, registers, instruction set, and modes of operation, to be able to program and operate this microprocessor effectively.		
2.0	**Skills**		
PLO.S5	✓ Master assembly programming techniques for the 8086 microprocessor, understanding instruction formats, addressing modes and coding conventions, in order to be able to develop efficient and optimized programs.	- Course project - Lectures - Tutorials - Assignment work	- Course project report & presentation - Written exams - Homework - Lab work
PLO.S7	✓ Develop analytical and problem-solving skills by engaging with case studies and hands-on projects that apply computer and 8086 microprocessor architecture concepts to real-world problems, reinforcing practical understanding and application of learned knowledge.		

2. Assessment Tasks for Students

	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	-	15%
2	Quizzes, Homework assignments	monthly	10%
3	First mid Term	8	25%
4	Final Exam	16	50%

D. Student Academic Counselling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
- Office hours - Blackboard interface

E. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Tanenbaum, "Architecture de l'ordinateur", 5ème édition, Pearson, 2005.
Essential References Materials	- PC - Data show
Electronic Materials	- Lecture material in PPT - Any Related material including the YouTube videos relating to engineering measurement - Blackboard
Other Learning Materials	- NA

2. Facilities Required

Item	Resources
Accommodation	**Classroom board** **Computer lab with the necessary software** **Internet access**
Technology Resources	**Data projector**

F. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

G. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**English II: Certification TOEIC B1,2**
Course Code:	LAC251
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Mrs. Rim RADDADI
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **1.5 (1.5-0-0)**
2. Course type **a.** College ☐ Department ■ Others ☐ **b.** Fundamental ■ Transversal ☐ Optional ☐
3. Level/year at which this course is offered: 1.2/3
4. Pre-requisites for this course (if any): LAC151
5. Co-requisites for this course (if any)**:** LAC351

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	16.5	39
2	**Blended**	22.5		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22.5
2	**Laboratory/Studio**	-
3	**Tutorial**	
4	**Others** (specify)	-
	Total	22.5

B. Course Objectives and Learning Outcomes

Course Description

This course prepares learners to sit for the toeic reading and listening test B1 level. It is conceived so that the learners would develop their listening and reading skills. The course provides them with tips and techniques for answering correctly and managing their time properly.
Topics to be considered are computer technology and computer components

This course is student centered and incorporates the 21st century skills in the ELT (English Language Teaching) classrooms, hence, creativity, collaboration, critical thinking, and communication are essential components of the learning process.

Course Main Objective

- listen for general information and listening for details
- Reading for general information and reading for details
- Understand topics around computer technology and computer problems
- Acquire tips and technique for the toeic exam
- Analyse graphics, visuals, tables, and diagrams orally or transfer them into a written text.

1. Course Learning Outcomes

CLOs		AlignedPLOs
1	**Knowledge and Understanding**	
1.1	Demonstrate an advanced understanding of computer science engineering principles	PLO.K1
2	**Skills**	
2.1	Analyse graphics, visuals, tables, and diagrams orally or transfer them into a written text.	PLO.S1

C. Course Content

No	List of Topics	Contact Hours
1	Chapter 1 : technology in use	4.5
2	Chapter 2 : material technology	4.5
3	Chapter 3 : faces of the internet	4.5
4	Chapter 4 : creative software	4.5
5	Chapter: programming jobs in ICT	4.5
Total		22.5

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**		
PLO.K1	Demonstrate an advanced understanding of computer science engineering principles	activities	Indirect assessement Peer to peer assessement
2.0	**Skills**		
PLO.S1	Analyse graphics, visuals, tables, and diagrams orally or transfer them into a written text.	activities	Assignments, Peer to peer assessement, Indirect assessement

2. Assessment Tasks for Students

	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	00%
2	Quizzes, Homework assignments	Random	00%
3	First mid Term	8	00%
5	Final Exam	16	100%

E. Student Academic Counseling and Support

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

- Office hours
- Blackboard interface
- Academic advisor
- Bibliotic

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Murphy, Raymond. English Grammar in Use. Fifth Edition. Cambridge University Press. 2019.
Essential References Materials	- Eastwood, John. Oxford guide to English grammar. Oxford University Press. 1997.
Electronic Materials	- You tube videos - British council website
Other Learning Materials	- NA

2. Facilities Required

Item	Resources
Accommodation	**Classroom board** **Computer lab with the necessary software** **Internet access**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**French II: Communication technique and preparation for Delf B2,1**
Course Code:	LAC252
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	MR. NOUREDDINE AMEUR
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours : **1.5 (1.5-0-0)**
2. Course type **a.** College ☐ Department ■ Others ☐ **b.** Fundamental ■ Transversal ☐ Optional ☐
3. Level/year at which this course is offered: 1.2/3
4. Pre-requisites for this course (if any):
5. Co-requisites for this course (if any)**:** None

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	16.5	39
2	**Blended**	22.5		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	15
2	**Laboratory / Studio**	-
3	**Tutorial**	7.5
4	**Others** (specify)	-
	Total	22.5

B. Course Objectives and Learning Outcomes

Course Description

This French communication course presents in a specific way the mechanisms necessary for a student to improve his or her oral and written language skills.

In this advanced stage of learning, students should be encouraged to correct frequent errors in their written and oral production by following a specific strategy. In this spirit, this course should be seen as a collection of linguistic, written and oral production activities using a variety of knowledge and evaluation methods.

Course Main Objective

- ✓ To enable the student to acquire (or consolidate in) the rapid and reliable use of all kinds of documentation, the ability to synthesise, to take accurate and complete notes and to express him/herself fluently and easily.
- ✓ To move from active listening/reading to coherent and effective written or oral production.
- ✓ Synthesise and reformulate.
- ✓ Avoiding any ambiguitý (oral and written).
- ✓ Mastering certain linguistic structures enabling one to speak and write coherently and fluently.
- ✓ Interact in formal and non-formal contexts.

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
2.1	- Knowledge of organizational communication - Fundamental concepts of communication: awareness of the complex process of communication, identification of the means of communication, the functions of speech, the obstacles to communication. - The ability to synthesise, to take accurate and complete notes and to express him/herself fluently and easily	PLO. K.2
2	**Skills**	
2.1	- Expressing oneself correctly in terms of written language and in the context of professional documents (letters, minutes of meetings, notes, files, press reviews, etc.), which presupposes an adequate command of the French language itself and of certain computer tools.	PLO.S.2
7.1	- Facilitate the practical application of acquired language skills in real-world software development scenarios	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	Presentation of the course and correction of the S1 exam.	2
2	Synthesis of documents.	2,5
3	Taking notes from audio/written material.	3
4	The internship report: a brief overview and steps to follow.	3
5	Practice session on some professional writing (cover letter and a CV prepared for an interview...)	2,5
6	Audio-visual session: videos to watch and comment on (interviews, how to write a good internship report, a cover letter for an internship, a professional e-mail...)	3,5
7	Preparation for the Delf B2 and a placement test	3,5
8	Pre-examination debriefing	1
9	Main review	1,5
Total		22,5

D. Teaching and Assessment

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

3	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
PLO. K.2	- Knowledge of organisational communication - the ability to synthesise, to take accurate and complete notes and to express him/herself fluently and easily	- Lecturing speaking & writing	- Assignments, Quizzes, Exams,
2.0	**Skills**		
PLO S.2	Expressing oneself correctly in terms of written language and in the context of professional documents (letters, minutes of meetings, notes, files, press reviews, etc.), which presupposes an adequate command of the French language itself and of certain computer tools. - Acquire the necessary skills to enter professional life. - Conducting a meeting: preparation, moderation, participation, evaluation of a meeting, conflict management, decision making.	- Lecturing - Tutorials - Courses project	- Assignments, Quizzes, Exams,

3	Course Learning Outcomes	Teaching Strategies	Assessment Methods
Plo.s7	Facilitate the practical application of acquired language skills in real-world software development scenarios	-	-

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	00%
2	Quizzes, Homework assignments	Random	00%
3	First mid Term	08	00%
4	Final Exam	16	100%

E. Student Academic Counselling and Support

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

- Office hours
- Blackboard interface
- Academic advisor
- Bibliotic

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Jérôme Koechlin, "La communication professionnelle: les clés pour réussir"("Professional communication: the keys to success"), Paris : Edition PPUR 2015(1ère edition). - Michel Danilo, Lincoln, Jean-Luc Penfornis, "Le français de la communication professionnelle"("French for professional communication"), Allemagne : Edition Cle International (collection Le français de) 1993.
Essential References Materials	- Electronic references: - https://www.podbean.com/podcast-detail/hvdrf-37d03/Learn-French-with-French-Podcasts---Fran%C3%A7ais-avec-Pierre - https://www.printbasprix.com/blog/quest-ce-que-communication-professionnelle/ - https://www.reussirmavie.net/Comment-preparer-son-entretien-d-embauche_a118.html
Electronic Materials	- Lecture material in Word & PDF… - Any Related material including the YouTube videos relating to Communication French.
Other Learning Materials	- NA

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**classroom board software …**
Technology Resources (AV, data show, Smart Board, software, etc.)	**data show;**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**Introduction to financial systems and banking management**
Course Code:	LAC253
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Mrs. Safaa ELGHEAIB
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **1.5 (1.5-0-0)**
2. Course type **a.** College ☐ Department ■ Others ☐ **b.** Fundamental ■ Transversal ☐ Optional ☐
3. Level/year at which this course is offered: 1.2/3
4. Pre-requisites for this course : Business creation and systems management
5. Co-requisites for this course (if any)**:**

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	16.5	39
2	**Blended**	22.5		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	12.5
2	**Laboratory/Studio**	-
3	**Tutorial**	10
4	**Others** (specify)	-
	Total	22.5

B. Course Objectives and Learning Outcomes

Course Description

The course covers the basic knowledge related to banking management and bank financial systems.

This course represents a brief introduction to banking and financial economics. It describes the main characteristics of the financial system and seeks to explain them: financial structure, bond market, stock market, foreign exchange market, financial crises and financial regulation, as well as the control of stocks and bonds and the bank balance sheet and better understand the principle of international monetary system.

Generates customer loyalty and also manage the money management in one dashboard. To manage customer spending and track their money

Course Main Objectives

- ✓ Understand the structure, functions, and components of financial systems globally and nationally.
- ✓ Comprehend the roles and responsibilities of financial institutions, with a focus on the banking sector
- ✓ Develop the ability to analyze and interpret trends, risks, and opportunities within financial markets.
- ✓ Develop practical skills in strategic financial planning for banks and financial institutions.
- ✓ Develop a mindset for continuous learning to adapt to dynamic changes in financial markets and banking practices

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	- Understand the structure, functions, and components of financial systems globally and nationally.	PLOK.1
1.3	- Comprehend the roles and responsibilities of financial institutions, with a focus on the banking sector	PLO.K.3
2	**Skills**	
2.1	- Develop the ability to analyze and interpret trends, risks, and opportunities within financial markets. - Develop practical skills in strategic financial planning for banks and financial institutions.	PLO.S2
	- Develop a mindset for continuous learning to adapt to dynamic changes in financial markets and banking practices	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	**Chapter I: Overview of the financial system and bank management**	3
2	**Section 1:** Definition and role of a bank	
3	**Section 2:** How do credit transactions work?	
4	**Section 3:** The functions of the financial system	
5	**Section 4:** Direct finance, indirect finance	
6	**Section 5:** The debt market and the equity market	
7	**Section 6:** Primary market and secondary market.	
8	**Chapter II: Banking and management of financial institutions**	4
9	**Section 1:** The bank balance sheet which includes an asset and a liability	
10	**Section 2:** Banking operations	
11	**Section 3:** Balance sheet management principles	
12	**Section 4:** Credit risk management	
13	**Section 5:** Interest rate risk management	
14	**Chapter III: financial institutions**	3
15	**Section 1:** Financial structure	
16	**Section 2:** Financial Crises	
17	**Section 3:** Financial regulation	
18	**Chapter IV: Bond market**	**7.5**
19	**Section 1:** Definition and characteristics	
20	**Section 2 :** The main clauses of the loan contract	
21	**Section 3 :** Valuation of bonds	
22	**Section 4 :** Zero-coupon bonds and stripped coupons: tax consequences	
23	**Section 5 :** Measures of rates of return	
24	**Section 6 :** Measurement of interest rates	
25	**Section 7 :** Changes in interest rates	
26	**Section 8 :** Structure of interest rates	
27	**Section 9 :** The risks of a bond investment	
28	**Section 10 :** The determinants of default risk	
29	**Chapter V: Equity and foreign exchange market**	**5**
30	**Section 1:** Stock market	
31	**Section 2:** Foreign exchange market	
32	**Section 3:** International Monetary System (IMS)	
Total		22.5

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**		
PLO.K.1 PLO.K.3	- Understand the structure, functions, and components of financial systems globally and nationally. - Comprehend the roles and responsibilities of financial institutions, with a focus on the banking sector	- Lecturing - Debate	- Assignments, Quizzes Homework
2.0	**Skills**		
PLO.S.1 PLO.S7	- Develop the ability to analyze and interpret trends, risks, and opportunities within financial markets. - Develop practical skills in strategic financial planning for banks and financial institutions. - Develop a mindset for continuous learning to adapt to dynamic changes in financial markets and banking practices	- Lecturing - Research activities - Assignment work	- Assignments, Quizzes - Homework - Course project report and presentation

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	-
2	Quizzes, Homework assignments	Random	-
3	First mid Term	-	-
4	Second mid Term	8	-
5	Final Exam	15	100%

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
- Office hours - Blackboard interface - Academic advisor - Bibliotic

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Mishkin (2004), Monnaie, Banque et marchés financiers, Pearson Education, ch. 9, Université d'Orléans
Essential References Materials	- Olivier Loisel (2021), « Économie bancaire et financière, Structure des taux d'intérêt », Ensae - Sylvie Coussergues, Gautier Bourdeaux, Héger Gabteni (2020), « Gestion de la banque - Tous les principes et outils à connaître », Dunod, 336 pages.
Electronic Materials	- Lecture material in PPT - Any Related material including the YouTube videos relating to banking management - Blackboard
Other Learning Materials	- NA

2. Facilities Required

Item	**Resources**
Accommodation	**Classroom board**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023

Course Title:	**supervised project II**
Course Code:	CSE261
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Naziha DHIBI
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **3 (0-0-0-3)**

2. Course type

a. University ☐ College ☐ Department ■ Others ☐

b. Required ■ Elective ☐

3. Level/year at which this course is offered: 1.2/3

4. Pre-requisites for this course (if any)**:**

5. Co-requisites for this course (if any)**: Algorithm and data structure, Programming workshop C++**

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	16.5	39
2	**Blended**	…..		
3	**E-learning**	…..		
4	**Distance learning**	…..		
5	**Other (Project)**	22.5		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	-
2	**Laboratory/Studio**	22.5
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	22.5

B. Course Objectives and Learning Outcomes

Course Description

This exercise will provide the student with a valuable opportunity to practically integrate the knowledge acquired into their learning. By applying these skills, he will be able to develop a concrete basic project. This approach will promote a better understanding of theoretical concepts while strengthening their ability to solve real-world problems, which will be beneficial for their future professional career.

Course Main Objective

- ✓ Application of Knowledge: Allow the student to apply the theoretical knowledge acquired as part of their study program to concrete situations in a professional environment.
- ✓ Development of Problem-Solving Skills: Encourage the student to solve real problems related to the completion of the project, thus strengthening their ability to analyze complex situations and find appropriate solutions.
- ✓ Presentation and Communication: Encourage the student to develop their presentation and communication skills by asking them to present the project in a clear and convincing manner.
- ✓ Performance Assessment: Assess the student's ability to plan, execute and complete a basic project successfully, using relevant assessment criteria.

1. Course Learning Outcomes

	CLOs	AlignedPLOs
1	**Knowledge and Understanding**	
1.1	✓ Application of Knowledge: Allow the student to apply the theoretical knowledge acquired as part of their study program to concrete situations in a professional environment.	PLO.K2
2	**Skills**	
2.1	✓ Development of Problem Solving Skills: Encourage the student to solve real problems related to the completion of the project, thus strengthening their ability to analyze complex situations and find appropriate solutions.	PLO.S1
	✓ Presentation and Communication: Encourage the student to develop their presentation and communication skills by asking them to present the project in a clear and convincing manner.	PLO.S4
	✓ Performance Assessment: Assess the student's ability to plan, execute and complete a basic project successfully, using relevant assessment criteria.	PLO.S6

C. Course Content

No	List of Topics	Contact Hours
1	Project 1. Block Chain	
2	Project 2. Transport Company	
3	Project 3. Public Transport	
4	Project 4. E-Doctor	
5	**Others** (specify)	
	Total	22.5

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**		
PLOK.1	✓ Application of Knowledge: Allow the student to apply the theoretical knowledge acquired as part of their study program to concrete situations in a professional environment.	- Class discussions - Assignments - Projects	Assignments, , Report, presentation
2.0	**Skills**		
PLOS.1	✓ Development of Problem Solving Skills: Encourage the student to solve real problems related to the completion of the project, thus strengthening their ability to analyze complex situations and find appropriate solutions.	- Class discussions - Assignments - Projects	Assignments, Quizzes, report presentation,
PLO.S4	✓ Presentation and Communication: Encourage the student to develop their presentation and communication skills by asking them to present the project in a clear and convincing manner.		
PLO.S6	✓ Performance Assessment: Assess the student's ability to plan, execute and complete a basic project successfully, using relevant assessment criteria.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Work carried	Weekly	20%
2	Prototype realization	Random	30%
3	Final Evaluation	-	50%

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
1- Office hours 2- Blackboard interface

F. Learning Resources and Facilities

1. Facilities Required

Item	Resources
Accommodation	**Classroom board** **Computer lab with the necessary software** **Internet access**
Technology Resources	**Data projector**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, course coordinator, Alumni, Employers	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, quality department	Direct
Quality of Learning resources	Faculty, Program Leaders,	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders,	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	07/02/2023