Course Title:	**English V Certification TOEIC C1**
Course Code:	LAC511
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Mme. Rim RADDADI
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **1.5(1.5-0-)**
2. Course type **a.** College ☐ Department ■ Others ☐ **b.** Fundamental ■ Transversal ☐ Optional ☐
3. Level/year at which this course is offered: 3.1/3
4. Pre-requisites for this course: LAC151, LAC251, LAC351, LAC441,

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	11	26
2	**Blended**	15		
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**	.....
4	**Others** (specify)	.....
	Total	.....

B. Course Objectives and Learning Outcomes

Course Description

This course prepares the learners to sit for the toeic reading and listening test C1 level. It is conceived so that learners would develop their listening and reading skills. Not only does the course provide them with tips and techniques for ansewering correctly and managing time during the exam, but it willl also provide them with the soft skill needed to face the labor .market

.Topics to be considered are socializing, emailing and telephoning

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

By the end of this course learners would be able to:

- listen for general information and listening for details
- Reading for general information and reading for details.
- Communicate effectively to collaborate with diverse teams and face real life challenges.

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	knowledge of basic communication skills while working within a team on innovative computer science engineering projects.	PLO K2
2	**Skills**	
2.1	Collaborate with diverse teams, demonstrate leadership skills, and work effectively in multidisciplinary environments to accomplish project goals.	PLO S.2
2.2	Demonstrate good organizational and planning skills, team working skills, and project management skills to face real life situations and to meet labor market requirements	PLO S.3

C. Course Content

No	List of Topics	Contact Hours
1 Socializing	- Introducing onself and others - socializing	4
2 business communication	- Telephoning - Emailing	4.5
3 Business Meeting	- ushering a meeting - communication skills	4.5
End of term exam		2
Total		15

D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	knowledge of basic communication skills while working within a team on innovative computer science engineering projects.	TBL Role play PBL	Indirect assessement Peer to peer assessement
2.0	**Skills**		
2.1	Collaborate with diverse teams, demonstrate leadership skills, and work effectively in multidisciplinary environments to accomplish project goals.	Activities Group work	exercices
2.2	Demonstrate good organizational and planning skills, team working skills, and project management skills to face real life situations and to meet labor market requirements	Activities group work	Mock test

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	-	00%
4	Final Exam	6	100%

E. Student Academic Counselling and Support

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

- ....
- ....
- ....
- ....

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Oxford Preparation Course For the TOEIC Test
Essential References Materials	Oxford Preparation Course For the TOEIC Test .....
Electronic Materials	You tube British council website
Other Learning Materials	.....

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	11/10/2022

Course Title:	**Human rights**
Course Code:	LAC512
Program:	Computer science Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Mohamed KAROUI
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: 3.1/3
4. Pre-requisites for this course :

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	11	26
2	**Blended**	15		
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**	-
4	**Others** (specify)	-
	Total	15

B. Course Objectives and Learning Outcomes

Course Description

This course explores the fundamental principles of human rights as set out in international treaties, national constitutions and customary norms. Students will be introduced to key concepts of human rights, their historical development, as well as national and international mechanisms for the protection and promotion of these rights. The course also looks at contemporary challenges related to human rights and examines the practical implications of these rights in various contexts.

Course Main Objective

At the end of the course, students should be able to:

- ✓ Understand the fundamental concepts of human rights and their historical development.
- ✓ Identify and analyze the sources of international human rights law.
- ✓ Know the main treaties and conventions relating to human rights.
- ✓ Examine national and international mechanisms for the protection of human rights.
- ✓ Analyze contemporary human rights challenges, including issues of gender, cultural diversity and development.
- ✓ Assess the impact of human rights on national legislation and public policies.
- ✓ Develop skills in human rights research, legal writing and advocacy.

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.2	✓ Understand the fundamental concepts of human rights and their historical development.	PLO.K2
	✓ **Skills**	
1.1	✓ Identify and analyze the sources of international human rights law	PLO.S1
2.1	✓ Examine national and international mechanisms for the protection of human rights.	PLO.S2
4.1	✓ Analyze contemporary human rights challenges, including issues of gender, cultural diversity and development.	PLO.S4
6.1	✓ Assess the impact of human rights on national legislation and public policies.	PLO.S6
6.1	✓ Develop skills in human rights research, legal writing and advocacy.	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to human rights	1.5
2	Philosophical and historical foundations of human rights	1.5
3	Sources of international human rights law	1.5
4	Main human rights treaties and conventions	1.5
5	National and international human rights protection mechanisms	1.5
6	Human rights and gender equality	1.5
7	Human rights and cultural diversity	1.5
8	Human rights and development	1.5
9	Human rights and corporate responsibility	1.5
10	Case studies and practical discussions	1.5
3	Recurring Neural Networks (RNN)	3
4	Transfer learning	3
Total		15

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.2	✓ Understand the fundamental concepts of human rights and their historical development.	Lecturing - Class discussions - Assignments - projects	Assignments, , Exams, Report
2.0	**Skills**		
S.1	✓ Identify and analyze the sources of international human rights law	- Lectures - Class discussions - Assignments - projects	Assignments, Exams, Report,
S.2	✓ Examine national and international mechanisms for the protection of human rights.		
S.4	✓ Analyze contemporary human rights challenges, including issues of gender, cultural diversity and development.		
S6	✓ Assess the impact of human rights on national legislation and public policies.		
S7	✓ Develop skills in human rights research, legal writing and advocacy.		

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	Final Exam	6	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 - Apply projects otherwise.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1. Donnelly, J. (2013). Universal Human Rights in Theory and Practice. Cornell University Press. 2. Morsink, J. (2019). The Universal Declaration of Human Rights: Origins, Drafting, and Intent. University of Pennsylvania Press. 3. Shelton, D. (2019). The Oxford Handbook of International Human Rights Law. Oxford University Press.
Essential References Materials	
Electronic Materials	● Lecture material in PPT ● Any Related material including the YouTube videos relating to engineering measurement Blackboard www.ingenieurs.com/documents/cours/systeme-interactif-aide-a-la-decision
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	11/10/2023

Course Title:	**Data mining and analysis**
Course Code:	CSE522/1
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Med fadhel SAAD
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: 3.1/3

4. Pre-requisites for this course (if any): algorithm and data structure (CSE131), Applied probabilities and statistics (CSE 112), Data base

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	22	52
2	**Blended**	30		
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**	15
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	30

B. Course Objectives and Learning Outcomes

Course Description

This course is designed to provide students with a comprehensive understanding of data mining and analysis techniques. Data mining is the process of discovering hidden patterns, trends, and insights within large datasets, while data analysis involves the examination and interpretation of data to extract valuable information. Through a combination of lectures, hands-on exercises, and real-world applications, students will gain the skills and knowledge needed to become proficient in data mining and analysis.

Course Main Objective

At the end of the module, the student should be able to:

- ✓ Gain a deep understanding of pattern evaluation and its significance in data mining.
- ✓ Develop proficiency in pattern-based classification and its applications.
- ✓ Master the principles of cluster analysis and its role in data segmentation.
- ✓ Acquire knowledge about different clustering methods and when to use them.
- ✓ Learn about advanced topics in pattern discovery, keeping up-to-date with industry advancements.
- ✓ Pattern Evaluation: Understand and apply techniques for evaluating patterns in data.
- ✓ Pattern-Based Classification: Build predictive models based on patterns discovered in data.
- ✓ Cluster Analysis: Utilize various clustering methods to group similar data points.
- ✓ Pattern Mining Applications: Apply data mining techniques to practical scenarios, such as text data analysis.
- ✓ Advanced Topics on Pattern Discovery: Explore advanced concepts and emerging trends in pattern discovery.

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
2.1	✓ Gain a deep understanding of pattern evaluation and its significance in data mining.	PLO.K2
2.2	✓ Acquire knowledge about different clustering methods and when to use them.	
3.1	✓ Develop proficiency in pattern-based classification and its applications.	PLO.K3
3.2	✓ Master the principles of cluster analysis and its role in data segmentation.	
3.3	✓ Learn about advanced topics in pattern discovery, keeping up-to-date with industry advancement	
2	**Skills**	
5.1	✓ Pattern Evaluation: Understand and apply techniques for evaluating patterns in data.	PLO.S5
6.1	✓ Pattern-Based Classification: Build predictive models based on patterns discovered in data.	PLO.S6
7.1	✓ Cluster Analysis: Utilize various clustering methods to group similar data points.	PLO.S7
3.1	✓ Pattern Mining Applications: Apply data mining techniques to practical scenarios, such as text data analysis.	PLO.S3
2.1	✓ Advanced Topics on Pattern Discovery: Explore advanced concepts and emerging trends in pattern discovery.	PLO.S2

C. Course Content

No	List of Topics	Contact Hours
1	Module 1: Pattern Evaluation; Mining Diverse Frequent Patterns ✓ Introduction to pattern evaluation ✓ Frequent pattern mining techniques ✓ Diverse frequent pattern mining	5
2	Module 2: Pattern-Based Classification ✓ Principles of classification ✓ Decision trees and rule-based classification ✓ Pattern-based classification algorithms	5
3	Module 3: Pattern Mining Applications: Mining Quality Phrases from Text Data; Advanced Topics on Pattern Discovery ✓ Text data preprocessing and analysis ✓ Mining quality phrases from text data ✓ Emerging trends in pattern discovery	4.5
4	Module 4: Cluster Analysis Overview; Cluster Analysis Introduction; Similarity Measures for Cluster Analysis ✓ Introduction to cluster analysis ✓ Differentiating between supervised and unsupervised learning ✓ Similarity measures for clustering	
5	Module 5: Partitioning-Based Clustering Methods; Hierarchical Clustering Methods ✓ K-means and hierarchical clustering ✓ Agglomerative and divisive clustering ✓ Choosing the right clustering method	4
6	Module 6: Hierarchical Clustering Methods (continued); Density-Based and Grid-Based Clustering Methods; Cluster Analysis ✓ Advanced hierarchical clustering techniques ✓ Density-based clustering (DBSCAN) ✓ Grid-based clustering (STING) ✓ Real-world applications of clustering analy	
Total		30

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.K2	✓ Gain a deep understanding of pattern evaluation and its significance in data mining. ✓ Acquire knowledge about different clustering methods and when to use them.	- Class discussions - Assignments - Projects	Assignments, , Report, exam
PLO.K3	✓ Develop proficiency in pattern-based classification and its applications. ✓ Master the principles of cluster analysis and its role in data segmentation. ✓ Learn about advanced topics in pattern discovery, keeping up-to-date with industry advancements.		
2.0	**Skills**		
PLO.S2	✓ Advanced Topics on Pattern Discovery: Explore advanced concepts and emerging trends in pattern discovery.	- Class discussions - Assignments - Projects	Assignments, , Report, exam
PLO.S3	✓ Pattern Mining Applications: Apply data mining techniques to practical scenarios, such as text data analysis.		
PLO.S5	✓ Pattern Evaluation: Understand and apply techniques for evaluating patterns in data.		
PLO.S6	✓ Pattern-Based Classification: Build predictive models based on patterns discovered in data.		
PLO.S7	✓ . Cluster Analysis: Utilize various clustering methods to group similar data points.		

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	-	00 %
4	Final Exam	11	100%

E. Student Academic Counselling 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. Han, J., Kamber, M., & Pei, J. (2011). Data mining: Concepts and techniques. Morgan Kaufmann. 2. Tan, P. N., Steinbach, M., & Kumar, V. (2013). Introduction to data mining. Pearson. 3. Witten, I. H., Frank, E., Hall, M. A., & Pal, C. J. (2016). Data mining: Practical machine learning tools and techniques. Morgan Kaufmann. 4. Hastie, T., Tibshirani, R., & Friedman, J. (2009). The elements of statistical learning: Data mining, inference, and prediction. Springer.
Essential References Materials	Resource Sites https://www.cs.waikato.ac.nz/ml/weka https://weka.wikispaces.com
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 (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	11/10/2022

Course Title:	**Big data framework & technologies**
Course Code:	CSE523/1
Program:	Computer science Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Rim Afdhal
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **3 (1.5-1.5-0)**
2. Course type **a.** College ☐ Department ■ Others ☐ **b.** Fundamental ■ Transversal ☐ Optional ☐
3. Level/year at which this course is offered: 3.1/3
4. Pre-requisites for this course (if any): CSE131, CSE323

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**	15
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	45

B. Course Objectives and Learning Outcomes

1. Course Description

This course covers the fundamental concepts of spark, the different versions of Spark (Scala, Python and Java), programming with Resilient Distributed Dataset (RDD), Handling graphs with GraphX, the different types of architecture: Standalone, Apache Mesos or Hadoop YARN, and the presentation of SparkML and MLlib.

2. Course Main Objective

- Acquire the fundamental concepts of spark.
- Explore the different modules of Spark and the Apache Hadoop environment
-Develop applications with spark.
-Handling of Datasets via SQL queries.
-Setting up a Spark cluster.
-Consumption of logs with Spark Streaming.
-Handling the GraphX API through different examples.

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Acquire the fundamental concepts of spark.	PLO.K1
1.2	Explore the different modules of Spark and the Apache Hadoop environment.	PLO.K2
2	**Skills**	
2.2	Handling the GraphX API through different examples. Handling of Datasets via SQL queries.	PLO.S2
2.3	Evaluate and analyze in real time with Spark Streaming	PLO.S3
2.6	Develop applications with spark	PLO. S6

C. Course Content

No	List of Topics	Contact Hours
1	Presentation of Apache Spark, History of the Framework, the different versions of Spark (Scala, Python and Java), the different modules of Spark.	2
2	Comparison with the Apache Hadoop environment,	2
3	Programming with Resilient Distributed Dataset (RDD), Presentation of RDDs Create, manipulate and reuse RDDs Accumulators and broadcastees variables	3
4	Manipulate structured data with Spark SQL: SQL, DataFrames and Datasets. The different types of data sources.	2
5	Interoperability with RDDs. Performance of Spark SQL.	3
6	Spark on a cluster: The different types of architecture: Standalone, Apache Mesos or Hadoop YARN.	2
8	Deploy applications with Spark-submit.	3

	Size a cluster	
9	Analyze in real time with Spark Streaming: Principle of operation, Presentation of Discretized Streams (DStreams)	2
10	The different types of sources, API manipulation, Comparison with Apache Storm.	2
11	Handling graphs with GraphX: Presentation of GraphX,The different operations, Create graphs,Vertex and Edge RDD, Presentation of different algorithms.	2
12	Introduction to Machine Learning, The different classes of algorithms	3
13	MidTerm exam	2
Total		30

C.1Practical work Content

No	List of Topics	Contact Hours
1	Installing Apache Spark	3
2	Programming with RDDs	3
3	Manipulating structured data with Spark SQL	3
4	Handling graphs with GraphX	3
5	Presentation of SparkML and MLlib, Implementations of the different algorithms in MLlib.	3
Total		15

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	Acquire the fundamental concepts of spark.	Lecturing	Assignments, Quizzes , Exams,
PLO.K2	Explore the different modules of Spark and the Apache Hadoop environment.		
2.0	**Skills**		
PLO.S2	Handling the GraphX API through different examples. Handling of Datasets via SQL queries.	Lecturing	Assignments, Quizzes , Exams,
PLO.S3	Evaluate and analyze in real time with Spark Streaming		
PLO. S6	Develop applications with spark		

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	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

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1. Data Science and Big Data Computing Frameworks and Methodologies Big Data: Concepts, Methodologies, Tools, and Applications (4 Volumes) Information Resources Management Association (USA) DOI: 10.4018/978-1-4666-9840-6 2. A Conceptual Framework for Big Data Analysis Fernando Almeida University of Porto, Portugal) and Mário Santos (University of Aveiro, Portugal) Source Title: Organizational, Legal, and Technological Dimensions of Information System Administration
Essential References Materials	Apache Spark
Electronic Materials	● Lecture material in PPT ● Any Related material including the YouTube videos relating to engineering measurement Blackboard https://www.computersciencedegreehub.com/big-data-books/
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, Faculty, Program Leaders, Peer Reviewer	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, Peer Reviewer	Direct, Indirect
Quality of Learning resources	Faculty, Program Leaders, Peer Reviewer	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders, Peer Reviewer	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	11/10/2022

Course Title:	**IT Security**
Course Code:	CSE531/1
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. wajdi SAADAOUI
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

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

2. Course type

a. College ☐ Department ■ Others ☐

b. Fundamental ■ Transversal ☐ Optional ☐

3. Level/year at which this course is offered: 3.1/3

4. Pre-requisites for this course (if any): Networking Fundamentals, Operating Systems: Foundational Knowledge of Computer Science

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**	…..	22	52
2	**Blended**	30		
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**	15
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	30

B. Course Objectives and Learning Outcomes

Course Description

The course aims to provide engineering students with a solid foundation in the principles and concepts of IT security. It covers the basic terminology, components, and technologies used in securing computer systems, networks, and data. The course focuses on increasing students' awareness of various security threats and vulnerabilities in the IT domain. It helps them understand the potential risks associated with cyber attacks, malware, social engineering, and other common security breaches.

Course Main Objective

At the end of the module, the student should be able to:
Develop an in-depth knowledge on fundamental IT security concepts and principles.
Develop skills in recognizing and assessing common security threats and vulnerabilities faced by computer systems, networks, and information resources, such as malware, social engineering attacks, data breaches, and network intrusions.
Inderstand different types of security controls: and Develop practical skills in securing systems and networks.

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	✓ Understand the fundamental concepts of IT security, including confidentiality, integrity, and availability.	PLO.K1
2.1	✓ Apply secure coding practices to develop and maintain secure web applications	PLO.K2
2.2	✓ Analyze data protection techniques, including encryption, access controls, and data masking.	PLO.K3
2	**Skills**	
2.1	✓ Develop critical thinking skills to analyze security issues and make informed decisions	PLO.S2
3.1	✓ Conduct risk assessments and create risk management plans.	PLO.S3
4.1	✓ Develop a deeper understanding and appreciation of cultural diversity through their participation in cultural events and international computer security clubs.	PLO.S4
6.1	✓ Monitor network traffic for security incidents and respond to threats effectively.	PLO.S6
7.1	✓ Implement security features in web development, including authentication and authorization.	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	Chapter 1: Introduction to IT Security • Overview of IT security fundamentals • Importance of IT security in today's digital landscape • Key principles and concepts in IT security	3
2	Chapter 2: Risk Assessment and Management • Conducting risk assessments and threat modeling • Identifying vulnerabilities and potential impacts • Developing risk mitigation strategies and incident response plans	3
3	Chapter 3: Cryptography and Data Protection • Fundamentals of cryptography • Symmetric and asymmetric encryption algorithms • Securing data at rest and in transit	3
4	Chapter 4: Network Security • Network infrastructure security • Firewalls, IDS/IPS, and network monitoring • Securing wireless networks	3
5	Chapter 5: Security in Web Applications • Common vulnerabilities in web applications • Best practices for secure coding • Web application firewalls and secure development frameworks	3
6	Labs: • Lab 1 : Detection of threats and vulnerabilities (Nmap/nessus/ettercap) • Lab 2 : Using the OpenSSL cryptographic toolbox • Lab 3 : Traffic Filtering on Cisco Packet Tracer • Lab 4 : Deploying Snort and exploring Cisco IOS IPS • Lab 5 : Creating a VPN Tunnel on Cisco Packet Tracer	15
Total		30

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 fundamental concepts of IT security, including confidentiality, integrity, and availability.	• Lectures • Hands-On Labs • Group Discussions • Research Projects	• Exam, Quizzes, Homework assignments Practical Work
PLO.K2	✓ Apply secure coding practices to develop and maintain secure web applications		
PLO.K3	✓ Analyze data protection techniques, including encryption, access controls, and data masking.		
3.0	**skills**		
PLO.S2	✓ Develop critical thinking skills to analyze security issues and make informed decisions	✓ Lectures ✓ Hands-On Labs ✓ Group Discussions Research Projects	▪ Exam, Quizzes, Homework assignments ▪ Practical Work
PLO.S3	✓ Conduct risk assessments and create risk management plans.		
PLO.S4	✓ Develop a deeper understanding and appreciation of cultural diversity through their participation in cultural events and international computer security clubs.		
PLO.S6	✓ Monitor network traffic for security incidents and respond to threats effectively.		
PLO.S7	✓ Implement security features in web development, including authentication and authorization.		

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	-	00 %
4	Final Exam	11	100 %

E. Student Academic Counselling 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. Wendell Odom, CCNA 200-301 Official Cert Guide, Volume 1, 2019 2. Wendell Odom, CCNA 200-301 Official Cert Guide, Volume 2, 2019 3. Stallings, W. (2017). "Cryptography and Network Security: Principles and Practice." Pearson. 4. Schneier, B. (2015). "Secrets and Lies: Digital Security in a Networked World." Wiley. 5. Anderson, R. (2020). "Security Engineering: A Guide to Building Dependable Distributed Systems." Wiley. 6. Whitman, M. E., & Mattord, H. J. (2017). "Management of Information Security." Cengage Learning.
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 (Classrooms, laboratories, demonstration rooms/labs, etc.)	**classroom board software …**
Technology Resources (AV, data show, Smart Board, software, etc.)	**data show;**

G. Course Quality Evaluation

EvaluationAreas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students, Faculty, Program Leaders, Peer Reviewer	Direct/Indirect
Extent of achievement of course learning outcomes.	Faculty, Program Leaders, Peer Reviewer	Direct, Indirect
Quality of Learning resources	Faculty, Program Leaders, Peer Reviewer	Direct, Indirect
Teaching and learning quality and effectiveness.	Students, Faculty Program Leaders, Peer Reviewer	Direct, Indirect

H. Specification Approval Data

Council / Committee	Computer Engineering Council
Date	11/10/2022

Course Title:	**Operational safety and fault tolerance**
Course Code:	CSE532/1
Program:	Computer science Engineering
Department:	Computer Engineering
College:	ESIP
Institution:	ESIP

A. Course Identification

1. Credit hours: **3 (1.5-1.5-0)**
2. Course type **a.** University ☐ College ☐ Department ■ Others ☐ **b.** Required ■ Elective ☐
3. Level/year at which this course is offered: 3.1/3
4. Pre-requisites for this course: Real-time systems, Programming, Computer science basics

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	11	26
2	**Blended**	15		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	10
2	**Laboratory/Studio**	-
3	**Tutorial**	5
4	**Others** (specify)	-
	Total	15

B. Course Objectives and Learning Outcomes

Course Main Objective

1. Acquire prior knowledge of basic operational safety and fault tolerance.
2. Understand the operational safety attributes.
3. Apply the analysis method of operational safety.
4. Manipulate the Reliability Diagram.
5. Manipulate the Fault tree.
6. Conclude effectively the basics, principles, and theories related to operational safety and fault tolerance with other disciplines

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	State and relate basics, principles, and theories related to the operational safety and fault tolerance.	PLO.K2
2	**Skills**	
2.2	Apply the analysis method of operational safety	PLO.S2
2.3	Manipulate the Fault tree	PLO.S3
2.4	Master the Concepts of operational safety	PLO.S4
2.5	Manipulate the Reliability Diagram.	PLO.S5
2.6	Master the different methods of operational safety	PLO.S6
2.7	Conclude effectively the basics, principles, and theories related to operational safety and fault tolerance with other disciplines	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to the operational safety and fault tolerance	1
2	Operational safety attributes	1
4	Concepts of operational safety	2
5	Reliability by Structure (architecture)	1
6	Analysis methods of operational safety	1
8	Reliability Diagram	2
9	Fault tree, Fault tolerance, Fault classification	2
Total		10

C. 1 Tutorial Content

No	List of Topics	Contact Hours
1	Operational safety	1
2	Reliability Diagram	2
3	Fault tree, Fault tolerance, Fault classification	2
Total		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.K2	State and relate basics, principles, and theories related to the operational safety and fault tolerance.	Lecturing	Assignments, Quizzes, Exams,
2.0	**Skills**		
PLO.S2	Apply the analysis method of operational safety	Lecturing	Assignments, Quizzes, Exams,
PLO.S3	Manipulate the Fault tree.		
PLO.S4	Master the Concepts of operational safety		Assignments, Report, Quizzes, Exams,
PLO.S5	Manipulate the Reliability Diagram.		
PLO.S6	Manipulate the Reliability Diagram.		
PLO.S7	Conclude effectively the basics, principles, and theories related to operational safety and fault tolerance with other disciplines		

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	-	00%
5	Final Exam	6	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. https://dl.acm.org/doi/book/10.5555/167698 2. https://www.zvei.org/fileadmin/user_upload/Presse_und_Medien/Publikationen/2019/Juli/Fehlertoleranz_in_der_Maschinensicherheit/ZVEI_WP_Fehlertoleranz_EN_Online.pdf 3. https://www.researchgate.net/profile/Cyrille-Artho/publication/322035384_Formal_Techniques_for_Safety-Critical_Systems_FTSCS_2015/links/5bbdc52e45851572315bdcdf/Formal-Techniques-for-Safety-Critical-Systems-FTSCS-2015.pdf#page=132
Essential References Materials	NA
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 (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	11/10/2022

Course Title:	**Interactive Decision Support System**
Course Code:	CSE541/1
Program:	Computer science Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Rim Afdhal
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: 3.1/3
4. Pre-requisites for this course: Statistics and data analysis, artificial intelligence, data structre

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	22	52
2	**Blended**	30		
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**	-
3	**Tutorial**	10
4	**Others** (specify)	-
	Total	30

B. Course Objectives and Learning Outcomes

Course Description

This course covers the topology of decisions in the company, formalization of a single and multi-criteria decision problem, Monte-Carlo simulation model and the Decision tree.

Course Main Objective

1. Acquire prior knowledge of decision theory.
2. Master the decision-making process.
3. Understand and modeling decision-making processes: the IDC model.
4. Master the concept of Interactive decision support systems (IDSS)
5. Study the IDSS and Computer science Decisional (ID).
6. Manipulate the IDSS of group
7. Manage the design problems and ethics related to interactive decision support systems
8. Represent effectively the basics, principles, and theories related to IDSS with other disciplines

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.3	Acquire prior knowledge of decision theory	PLO.K3
2.3	Understand and modeling decision-making processes: the IDC model.	
2	**Skills**	
2.1	Master the decision making process.	PLO.S1
2.2	Master the concept of Interactive decision support systems (IDSS)	PLO. S2
2.4	Manipulate the IDSS of group	PLO. S4
2.6	Represent effectively the basics, principles, and theories related to IDSS with other disciplines	PLO. S6
2.7	Manage the design problems and ethics related to interactive decision support systems	PLO. S7

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Decision Theory	2
2	Typology of decisions in the company	2
3	Modeling of the decision-making process	2
4	Representation of decision	2
5	Formalization of a single and multi-criteria decision problem	2
6	Types of decision models	2
7	Monte-Carlo simulation model	2
8	IDSS of group	2
9	Decision making in the face of risk and uncertainty	2
10	Decision tree	2
Total		20

C.1 Tutorial Content

No	List of Topics	Contact Hours
1	Decision making and mathematical modeling	2
2	Representation of decision and Formalization of a single and multi-criteria decision problem	4
3	Decision tree	4
Total		10

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.K3	Acquire prior knowledge of decision theory. Understand and modeling decision-making processes: the IDC model.	Lecturing	Assignments, Quizzes , Exams,
2.0	**Skills**		
PLO.S1	Master the decision making process.	Lecturing Class discussions projects	Assignments, Quizzes , Exams,
PLO.S2	Master the concept of Interactive decision support systems (IDSS)		
PLO.S4	Manipulate the IDSS of group		
PLO.S6	Represent effectively the basics, principles, and theories related to IDSS with other disciplines		
PLO.S7	Manage the design problems and ethics related to interactive decision support systems		

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	Final Exam	11	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
- Apply projects otherwise.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1. Bernard ESPINASSE, Introduction to Interactive Decision Support Systems (SIAD) 2. Arnaud Zinflou, Interactive decision support system based on genetic algorithms for multi-objective optimization
Essential References Materials	Python
Electronic Materials	• Lecture material in PPT • Any Related material including the YouTube videos relating to engineering measurement Blackboard www.ingenieurs.com/documents/cours/systeme-interactif-aide-a-la-decision
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	11/10/2022

Course Title:	**Advanced machine learning**
Course Code:	CSE542/1
Program:	Computer science Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Rim Afdhal
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: 3.1/3
4. Pre-requisites for this course (if any): CSE112, algorithm data structure, CSE432
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**	…..	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**	15
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	45

B. Course Objectives and Learning Outcomes

Course Description

This Advanced Machine Learning course offers an in-depth exploration of advanced machine learning concepts and techniques. Students will delve into advanced topics such as meta-learning, deep neural networks, deep learning, autoencoders, deep Boltzmann machines, deep belief networks, convolutional neural networks (CNN), recurrent neural networks (RNN) and transfer learning.

Course Main Objective

- ✓ Develop a deep comprehension of advanced machine learning concepts, including deep learning, meta-learning, and transfer learning.
- ✓ Cultivate expertise in identifying complex research problems within the domain of machine learning and artificial intelligence.
- ✓ Foster advanced critical thinking skills to deconstruct complex computational challenges encountered in machine learning and artificial intelligence.
- ✓ Enable students to evaluate, compare, and select appropriate machine learning solutions based on their understanding of the problem's nature and characteristics.
- ✓ Cultivate advanced communication skills, enabling students to articulate complex technical concepts clearly and persuasively through oral presentations.
- ✓ Develop proficiency in crafting comprehensive written reports that communicate research methodologies, findings, and implications effectively.
- ✓ Develop advanced analytical skills to assess the performance of hardware/software systems in the context of machine learning tasks.
- ✓ Apply machine learning models to real-world datasets and assess their performance, including accuracy, efficiency, and scalability.
- ✓ Develop the ability to adapt machine learning models and systems to address emerging challenges and evolving technologies
- ✓ Develop a deep understanding of embedded systems concepts, architectures, and their role in the broader IoT ecosystem.
- ✓ Encourage the ethical consideration of software design choices, including fairness, bias, and transparency in machine learning systems.

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	✓ Develop a deep comprehension of advanced machine learning concepts, including deep learning, meta-learning, and transfer learning.	PLO.K1
1.2	✓ Cultivate expertise in identifying complex research problems within the domain of machine learning and artificial intelligence.	PLO.K2
	✓ **Skills**	
1.1	✓ Foster advanced critical thinking skills to deconstruct complex computational challenges encountered in machine learning and artificial intelligence.	PLO.S1
1.2	✓ Enable students to evaluate, compare, and select appropriate machine learning solutions based on their understanding of the problem's nature and characteristics.	
2.1	✓ Cultivate advanced communication skills, enabling students to articulate complex technical concepts clearly and persuasively through oral presentations.	PLO.S2
2.2	✓ Develop proficiency in crafting comprehensive written reports that communicate research methodologies, findings, and implications effectively.	
5.1	✓ Develop advanced analytical skills to assess the performance of hardware/software systems in the context of machine learning tasks.	PLO.S5
5.2	✓ Apply machine learning models to real-world datasets and assess their performance, including accuracy, efficiency, and scalability.	
5.3	✓ Develop the ability to adapt machine learning models and systems to address emerging challenges and evolving technologies	
6.1	✓ Develop a deep understanding of embedded systems concepts, architectures, and their role in the broader IoT ecosystem.	PLO.S6
6.1	✓ Encourage the ethical consideration of software design choices, including fairness, bias, and transparency in machine learning systems.	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to advanced machine learning: Meta-learning	3
2	Deep neural networks	3
3	Deep learning	3
4	Auto-encoders	3
5	Deep Boltzmann machines	4
6	Deep Belief Networks	3
7	Convolutional Neural Networks (CNN)	3
8	Recurring Neural Networks (RNN)	3
9	Transfer learning	3
10	MidTerm exam	2
Total		30

C .1 Practical work Content

No	List of Topics	Contact Hours
1	Deep neural networks	3
2	Deep learning, Convolutional Neural Networks (CNN)	6
3	Recurring Neural Networks (RNN)	3
4	Transfer learning	3
Total		15

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.2	✓ Cultivate advanced communication skills, enabling students to articulate complex technical concepts clearly and persuasively through oral presentations.	Lecturing	Assignments, Quizzes , Exams,
	✓ Develop proficiency in crafting comprehensive written reports that communicate research methodologies, findings, and implications effectively.		
2.0	**Skills**		
S.1	✓ Foster advanced critical thinking skills to deconstruct complex computational challenges encountered in machine learning and artificial intelligence. ✓ Enable students to evaluate, compare, and select appropriate machine learning solutions based on their understanding of the problem's nature and characteristics	- Lectures - Class discussions - Assignments - projects	Assignments, Quizzes , Exams, Report,

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
S.2	✓ Cultivate advanced communication skills, enabling students to articulate complex technical concepts clearly and persuasively through oral presentations. ✓ Develop proficiency in crafting comprehensive written reports that communicate research methodologies, findings, and implications effectively.		
S.5	✓ Develop advanced analytical skills to assess the performance of hardware/software systems in the context of machine learning tasks. ✓ Apply machine learning models to real-world datasets and assess their performance, including accuracy, efficiency, and scalability. ✓ Develop the ability to adapt machine learning models and systems to address emerging challenges and evolving technologies		
S6	✓ Develop a deep understanding of embedded systems concepts, architectures, and their role in the broader IoT ecosystem..		
S7	✓ Encourage the ethical consideration of software design choices, including fairness, bias, and transparency in machine learning systems		

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	Random	00%
3	First mid term exam	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 - Apply projects otherwise.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1. Deep Learning (Adaptive Computation and Machine Learning series) Illustrated Edition by Ian Goodfellow (Author), Yoshua Bengio (Author), Aaron Courville (Author) 2. Sarker, I.H. Machine Learning: Algorithms, Real-World Applications and Research Directions. SN COMPUT. SCI. 2, 160 (2021). https://doi.org/10.1007/s42979-021-00592-x
Essential References Materials	Python
Electronic Materials	• Lecture material in PPT • Any Related material including the YouTube videos relating to engineering measurement Blackboard www.ingenieurs.com/documents/cours/systeme-interactif-aide-a-la-decision
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	11/10/2022

Course Title:	**Preparation to certification ISTQB**
Course Code:	CSE551/1
Program:	Computer science Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Rim Afdhal
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **3 (1.5-1.5-0)**
2. Course type **a.** College ☐ Department ■ Others ☐ **b.** Fundamental ■ Transversal ☐ Optional ☐
3. Level/year at which this course is offered: 3.1/3
4. Pre-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**	…..	22	52
2	**Blended**	30		
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**	15
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	30

B. Course Objectives and Learning Outcomes

Course Description

This course covers the basic notions and concepts of software testing, the test during the software development lifecycle, the types of tests: functional, non-functional, black box, white box, the testing techniques, the review techniques: Ad hoc, role-based, perspective-based, as well as the test support tools.

Course Main Objective

1. Acquire prior knowledge of fundamentals of testing.
2. Understand the test process: the test activities and associated tasks.
4. Master the types and the levels of testing.
5. Study the main test approaches: Big-bang, Ad-hoc, Incremental, Exploratory, Back to Back...
6. Identify the test conditions and design the test cases
7. Manage the design problems and ethics related to software testing.
8. Represent effectively the basics, principles, and theories related to software testing with other disciplines

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Aware with basics and principles related to software testing.	PLO.K2
2	**Skills**	
2.1	Apply the knowledge of software testing to produce solutions and designs that meet specified needs with consideration of society.	PLO.S2
2.3	Master the types and the levels of testing.	PLO.S3
2.4	Evaluate and analyze the performance and sustainability of designed and/or existing information systems.	PLO.S4
2.5	Identify the test conditions and design the test cases	PLO.S5
2.6	Represent effectively the basics, principles, and theories related to software testing with other disciplines	PLO.S6
2.7	Design, conduct, analyze, and evaluate practices, projects, and experiments related to software testing issues.	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	Fundamentals of Testing: Why are the tests necessary? Issues and quality, test vocabulary (verification, validation, error, defect, failure), the importance of traceability…	2
2	Testing and debugging	1
3	The 7 general principles of Testing	1
4	Test during the software development lifecycle	1
5	Test levels, types of testing	2
6	Static tests	2
7	Testing Techniques	2
8	Test management	2
9	Defect management	1
10	Test support tools	1
Total		15

C . Practical work Content

No	List of Topics	Contact Hours
1	Testing and debugging	3
2	Test during the software development lifecycle	3
3	Testing Techniques	3
4	Defect management	3
5	Test support tools	3
Total		15

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.K2	Aware with basics and principles related to software testing.	Lecturing	Assignments, Quizzes , Exams,
	Skills		
PLO.S2	Apply the knowledge of software testing to produce solutions and designs that meet specified needs with consideration of society.		
PLO.S3	Master the types and the levels of testing.	Lecturing	Assignments, Quizzes , Exams,
PLO.S4	Evaluate and analyze the performance and sustainability of designed and/or existing information systems. Identify the test conditions and design the test cases		
PLO.S5			
	Identify the test conditions and design the test cases		
PLO.S6	Represent effectively the basics, principles, and theories related to software testing with other disciplines		
PLO.S7	Design, conduct, analyze, and evaluate practices, projects, and experiments related to software testing issues.		

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	Final Exam	11	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 - Apply projects otherwise.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1. https://www.istqb.org/certification-path-root/foundation-level/foundation-level-content.html
Essential References Materials	
Electronic Materials	• Lecture material in PPT • Any Related material including the YouTube videos relating to engineering measurement Blackboard www.ingenieurs.com/documents/cours/systeme-interactif-aide-a-la-decision
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	11/10/2022

Course Title:	**Software architecture project**
Course Code:	CSE553/1
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. wajdi SAADAOUI
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **3 (1.5-1.5-0)**
2. Course type **a.** College ☐ Department ■ Others ☐ **b.** Fundamental ■ Transversal ☐ Optional ☐
3. Level/year at which this course is offered: 3.1/3
4. Pre-requisites for this course: CSE452/1, CSE332, CSE131

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	11	26
2	**Blended**	15		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester)

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

B. Course Objectives and Learning Outcomes

Course Description

This advanced course aims to prepare computer science students for the professional world by engaging them in complex, real-world software development projects. It covers advanced aspects of the software development lifecycle, from design to maintenance, with an emphasis on problem solving, team collaboration and innovation.

Course Main Objective

- ✓ Deepen understanding of advanced software development concepts.
- ✓ Master project management methodologies adapted to large-scale projects.
- ✓ Develop advanced skills in software design and architecture.
- ✓ Engage in agile and iterative development practices.
- ✓ Explore emerging technologies and industry trends

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
2.1	✓ Deepen understanding of advanced software development concepts.	PLO.K2
2	**Skills**	
2.1	✓ Master project management methodologies adapted to large-scale projects	PLO.S2
3.1	✓ Develop advanced skills in software design and architecture.	PLO.S3
4.1	✓ Ability to carry out a complete software development project	PLO.S4
	✓ Integration of new technologies into projects.	PLO.S5
6.1	✓ Engage in agile and iterative development practices.	PLO.S6
7.1	✓ Explore emerging technologies and industry trends	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	✓ **Architecture Logicielle Avancée** : • Modèles architecturaux (Microservices, SOA). • Conception de systèmes distribués.	3
2	✓ **Advanced Project Management:** • Advanced agile methods (Extreme Programming, Feature-Driven Development). • Complex risk management.	3
3	✓ **Security in Software Development:** • Software security principles. • Secure coding practices.	3
4	✓ **Artificial Intelligence and Machine Learning:** • Practical applications in software development. • Integration of ML models into projects.	3
5	✓ **Big Data and Analytics:** • Big data processing. • Use of Big Data frameworks (Hadoop, Spark).	3
Total		15

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.K2	✓ Deepen understanding of advanced software development concepts.	✓ Lectures ✓ Group Discussions Research Projects	▪ Homework assignments Practical Work
3.0	**skills**		
PLO.S2	✓ Master project management methodologies adapted to large-scale projects.	✓ Lectures ✓ Hands-On Labs ✓ Group Discussions Research Projects	▪ Homework assignments ▪ Practical Work
PLO.S3	✓ Develop advanced skills in software design and architecture.		
PLO.S4	✓ Ability to carry out a complete software development project		
PLO.S5	✓ Integration of new technologies into projects.		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
PLO.S6	✓ Engage in agile and iterative development practices.		
PLO.S7	✓ Explore emerging technologies and industry trends		

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 Counselling 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.
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**

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	11/10/2022

Course Title:	**Service oriented engineering**
Course Code:	CSE561/1
Program:	Computer science Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Thouraya GOUASMI
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **3 (1.5-1.5-0)**
2. Course type **a.** University ☐ College ☐ Department ■ Others ☐ **b.** Required ■ Elective ☐
3. Level/year at which this course is offered: 3.1/3
4. Pre-requisites for this course (if any)**:** Software architecture, Databases, Object-oriented design

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	22	52
2	**Blended**	30		
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**	15
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	30

B. Course Objectives and Learning Outcomes

Course Description

This course describes service-oriented engineering, one of the distributed architectural patterns based on the principle of separating the business activity into set of services. These services can be assembled together according to the principle of weak coupling to execute the desired application. In fact, after introducing the different architectural styles, this course presents XML technologies and the limitations of conventional technologies for the integration of P2P applications. It describes the emerging technology of implementing the service-oriented architecture SOA as the web services 1.0 (UDDI, WSDL and SOAP) and 2.0 (REST *Representational State Transfer*). It specifies, also, the implementation of web services on the provider side as well as the client side.

Course Main Objective

- ✓ Acquire prior knowledge of architectural styles (N-tiers, middlewares, etc.).
- ✓ Discovery the principles of service oriented architecture.
- ✓ Master XML technologies (XML, DTD, XML schema).
- ✓ Discovery the service web 1.0 technology architecture and the associated technologies.
- ✓ Discovery the service web 2.0 technology architecture RESTful.
- ✓ Model complex applications using web service technology
- ✓ Formalize with web service development and deployment platforms and tools.
- ✓ Using effectively the basics, principles, and theories to test and proof the complex problems
- ✓ Explore case studies and industrial scenarios to develop an in-depth understanding of service-oriented engineering applications in specialized areas such as artificial intelligence, data science, IT security or computer networks
- ✓ Acquire skills in service-oriented engineering project planning, including identifying needs, setting objectives, establishing schedules and managing resources
- ✓ Encourage students to expand their professional network by participating in social and cultural events related to their field of study
- ✓ Apply specialized knowledge to identify and resolve complex issues related to service integration, API management, service security and interoperability.
- ✓ Using effectively the basics, principles, and theories to test and proof the complex problems

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
2.1	✓ Acquire prior knowledge of architectural styles (N-tiers, middlewares, etc.).	PLO.K2
2.2	✓ Discovery the principles of service oriented architecture. ✓ Master XML technologies (XML, DTD, XML schema).	
2.3	✓ Discovery the service web 1.0 technology architecture and the associated technologies.	
2.4	✓ Discovery the service web 2.0 technology architecture RESTful.	
3.1	✓ Explore case studies and industrial scenarios to develop an in-depth understanding of service-oriented engineering applications in specialized areas such as artificial intelligence, data science, IT security or computer networks	PLO.K3
2	**Skills**	
2.1	✓ Formalize with web service development and deployment platforms and tools.	PLO.S2
3.1	✓ Acquire skills in service-oriented engineering project planning, including identifying needs, setting objectives, establishing schedules and managing resources	PLO.S3
4.1	✓ Encourage students to expand their professional network by participating in social and cultural events related to their field of study	PLO.S4
6.1	✓ Apply specialized knowledge to identify and resolve complex issues related to service integration, API management, service security and interoperability.	PLO.S6
7.1	✓ Using effectively the basics, principles, and theories to test and proof the complex problems	PLO.S7

C.1. Course Content

No	List of Topics	Contact Hours
1	SOA - Principle and basic concepts	1.5
	1.1 Evolution of information systems (programming model, architecture, web)	
	1.2 Architecture of SOA	
	1.3 Challenge and implementation of SOA	
2	XML- eXtensible Markup Language	3
	2.1 XML Language definition and structure	
	2.2 DTD - Document Type Definition	
	2.3 XML- Schema	
3	Web Services	2
	3.1 Web service 1.0 and these technologies	
	3.2 web service 2.0/ REST type	
4	SOAP- Simple Object Access Protocol	1.5
5	WSDL- Web Service Description Language	1.5
6	UDDI - Universal Description, Discovery and Integration	1.5
7	REST - REpresentational State Transfert	2
15	MidTerm-2	2
Total		15

C.2. Practical Work Content

No	List of Topics	Contact Hours
1	TP1 : Introduction to XML	1.5
2	TP2 : XML & DTD	2
3	TP3 : XML-schema	2.5
4	TP4 : Create a client-side web service	3
5	TP5 : Create a provider-side web service	3
6	TP6 : Create a Rest web service	3
Total		15

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.K2	✓ Acquire prior knowledge of architectural styles (N-tiers, middlewares, etc.). ✓ Discovery the principles of service oriented architecture. ✓ Discovery the service web 1.0 technology architecture and the associated technologies. ✓ Discovery the service web 2.0 technology architecture RESTful.	- Lecturing - Hands-On Labs and Coding Exercises - Project-Based Learning	Assignments, Quizzes , Exams
PLO.K3	✓ Explore case studies and industrial scenarios to develop an in-depth understanding of service-oriented engineering applications in specialized areas such as artificial intelligence, data science, IT security or computer networks		
2.0	**Skills**		
PLO.S2	Formalize with web service development and deployment platforms and tools.	Lab demonstration - Lecturing - Hands-On Labs and Coding Exercises Project-Based Learning	Assignments, Quizzes , Exams,
PLO.S3	✓ Acquire skills in service-oriented engineering project planning, including identifying needs, setting objectives, establishing schedules and managing resources		
PLO.S4	✓ Encourage students to expand their professional network by participating in social and cultural events related to their field of study		
PLO.S6	✓ Apply specialized knowledge to identify and resolve complex issues related to service integration, API management, service security and interoperability.		
PLO.S7	✓ Using effectively the basics, principles, and theories to test and proof the complex problems		

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	-	-
5	Final Exam	11	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	- Jean-Marie Chauvet, « Services Web avec SOAP, WSDL, UDDI, ebXML... », 2002 - Sanjiva Weerawarana, Francisco Curbera, Frank Leymann, Tony Storey, Donald F. Ferguson, « Web - Services Platform Architecture », 2005 - Cours web services, http://www-inf.int-evry.fr/cours/WebServices, Université de paris - France. - Benny Mathew, Matjaz Juric, Poornachandra « Business Process Execution Language for WS », - Packt Publishing, January 2006 - 372 pages - ISBN : 1904811817 - Cours Evolution des systèmes d'informations, Dr H. EL BOUHISSI
Essential References Materials	- Computer - Network
Electronic Materials	- Data show
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	11/10/2023

Course Title:	**Model Driven Engineering**
Course Code:	CSE562/1
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Mr. AHMED KHLIFI
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: 3.1/3

4. Pre-requisites for this course (if any): UML modeling, Software design

1. Mode of Instruction (mark all that apply

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	22	52
2	**Blended**	30		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours

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

B. Course Objectives and Learning Outcomes

Course Description

This course presents the principles of model-driven software engineering. In Particular, the course covers the process of software development through model transformations and the concepts of platform-independent and platform-specific models.
The course also covers modeling and meta-modeling principles and standards, domain-specific languages, and the Object Management Group's Model-Driven Architecture (MDA).

Course Main Objective

- Understand the fundamental concepts and principles of MDE.
- Learn how MDE differs from traditional software development approaches.
- Explore the advantages and disadvantages of MDE in software engineering.
- Skills
- Learn how MDE can enhance the reliability and correctness of process models.
- Apply MDE concepts to a real-world case study involving process modeling.
- Investigate the challenges and opportunities presented by model-driven engineering in familiar and unfamiliar contexts within IoT.
- Recognize the importance of effective project planning and project management in model-driven engineering initiatives, including requirements analysis, modeling, code generation, and quality assurance.

1. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	✓ Understand the fundamental concepts and principles of MDE. ✓ Learn how MDE differs from traditional software development approaches.	PLO.K.1
1.1	✓ Explore the advantages and disadvantages of MDE in software engineering.	PLO.K3
2	**Skills**	
2.1	✓ Learn how MDE can enhance the reliability and correctness of process models.	PLO.S2
3.1	✓ Apply MDE concepts to a real-world case study involving process modeling.	PLO.S3
6.1	✓ Investigate the challenges and opportunities presented by model-driven engineering in familiar and unfamiliar contexts within IoT.	PLO.S6
7.1	✓ Recognize the importance of effective project planning and project management in model-driven engineering initiatives, including requirements analysis, modeling, code generation, and quality assurance.	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	☐ Chapter 1: Introduction to model-driven engineering • Interest of models • Models and meta-models • Types of models in a development • Model transformation	3
2	☐ Chapter 2: Case Study: Verifying Process Models • Definition of the problem • Petri nets • Translation of processes into Petri nets • Formalization of the termination property • General architecture of the application	6
3	☐ Chapter 3: Meta-modeling (with Ecore) • Meta-mo deling languages • The Ecore language of Eclipse/EMF • SimplePDL metamodeling • PetriNet metamodeling	7
4	☐ Chapter 4: The OCL language • Motivation • General presentation of OCL • Syntax of the language	7
5	☐ Chapter 5: Transformations • Application to the case study • Background/Motivation • Transformation languages • Types of transformation • The QWL standard • Conclusion	7
Total		30

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 fundamental concepts and principles of MDE. ✓ Learn how MDE differs from traditional software development approaches.	Lecturing Course project Assignment work	Assignments, Quizzes, homework
PLO.K2	✓ Explore the advantages and disadvantages of MDE in software engineering.		
2.0	**Skills**		
PLO.S2	✓ Learn how MDE can enhance the reliability and correctness of process models.	- Lectures - Class discussions - Course project Assignment work - projects	Assignments, Report, Quizzes, Exams
PLO.S3	✓ Apply MDE concepts to a real-world case study involving process modeling.		
PLO.S6	✓ Investigate the challenges and opportunities presented by model-driven engineering in familiar and unfamiliar contexts within IoT.		
PLO.S7	✓ Recognize the importance of effective project planning and project management in model-driven engineering initiatives, including requirements analysis, modeling, code generation, and quality assurance.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes, Homework assignments	Random	00%
2	Final Exam	11	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

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	▪ Brambilla, Marco, et al. Model-Driven Software Engineering in Practice, Second Edition. - Springer Nature, 31 May 2022. ▪ Slimane Hammoudi, et al. Model-Driven Engineering and Software Development : 7th International Conference, MODELSWARD 2019, Prague, Czech Republic, February 20{U2013}22, 2019, Revised Selected Papers. Cham, Springer International Publishing, 2020. ▪ García DíazVicente, et al. *Advances and Applications in Model-Driven Engineering*. Hershey, PA, Information Science Reference, 2014.
Essential References Materials	▪ Lecture material in PPT ▪ Any Related material including the YouTube videos relating to engineering measurement. ▪ Blackboard
Electronic Materials	▪ Lecture material in PPT ▪ Blackboard
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	05/10/2022

Course Title:	**Development of advanced web applications (JEE /.NET)**
Course Code:	CSE563/1
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Mouna HALIMA
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: 3.1/3

4. Pre-requisites for this course (if any): Object-oriented programming, Databases and SQL, CSE222

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	22	52
2	**Blended**	30		
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**	15
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	30

B. Course Objectives and Learning Outcomes

Course Description

This course introduces students to Java EE, a platform for building enterprise-level, scalable, and robust Java applications. It emphasizes the use of the MVC architectural pattern to design and develop web applications. Students will learn about Servlets, JavaServer Pages (JSPs), and Enterprise JavaBeans (EJBs) while working in groups to develop Java EE applications.

Course Main Objective

- ✓ Understanding the fundamental concepts of Java EE (Enterprise Edition), including its purpose, architecture, and components.
- ✓ Ability to explain the role of Java EE in building enterprise-level applications and its advantages.
- ✓ Ability to differentiate between the Model, View, and Controller components in MVC and comprehend how they interact
- ✓ Ability to develop and deploy EJB components within a Java EE application.
- ✓ Contribution to the iterative development process, meeting project milestones, and adaptability to changing project requirements.
- ✓ Competence in using version control systems (e.g., Git) and project management tools.

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	✓ Understanding the fundamental concepts of Java EE (Enterprise Edition), including its purpose, architecture, and components.	PLO.K 2
1.2	✓ Acquire a wealth of expertise in the domain of developing web applications advanced and concentrated on problems and developments in recherche specifiques in the industry.	PLO.K 3
2	**Skills**	
2.1	✓ Develop the ability to effectively and clearly communicate complex technical concepts related to web development, as well as relevant research findings.	PLO.S2
	✓ Demonstrate a thorough understanding of the job market requirements for advanced web development, applying best practices and producing solutions that meet professional standards and industry expectations.	PLO.S3
2.3	✓ Develop the ability to apply knowledge acquired in the classroom to discussions and social activities related to web development, thereby fostering a deeper understanding of industry trends and challenges	PLO.S4
3.2	✓ Develop skills in managing embedded systems in advanced web applications, optimizing their use to meet specific project needs.	PLO.S6
	✓ Apply agile development methodologies to manage dynamic aspects of the project, taking into account changing requirements and priorities.	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	Chapter1: Introduction to Java EE and MVC Architecture • Overview of Java EE architecture and components • Introduction to MVC architecture and its benefits • Setting up a development environment and create « Hello world » app (first app).	2h 1h30 3h30
2	Chapter2: Servlets and JSPs • Introduction to web applications and HTTP • Understanding Servlets and JSPs • create web pages with JSPs and Servlets	1h30 2h 3h30
3	Chapter3: Enterprise JavaBeans (EJB) with MVC Architecture • Developing Message-Driven Beans • Understanding container-managed persistence using MVC architecture	3h30 3h30
4	Chapter4: Develop JEE app in groups and preparation for exam (doing an exam simulation)	9h
Total		30

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.2	✓ Understanding the fundamental concepts of Java EE (Enterprise Edition), including its purpose, architecture, and components.	- Lecturing - Project-Based Learning - Hands-On Labs and Coding Exercises	Assignments, Quizzes, Exams,
K.3	✓ Acquire a wealth of expertise in the domain of developing web applications advanced and concentrated on problems and developments in recherche specifiques in the industry.		
2.0	**Skills**		
S.2	✓ Develop the ability to effectively and clearly communicate complex technical concepts related to web development, as well as relevant research findings.	- Lecturing - Project-Based Learning - Class discussions - Assignments	Assignments, Quizzes, Exams,
S.3	✓ Demonstrate a thorough understanding of the job market requirements for advanced web development, applying best practices		Assignments, Report, Quizzes, Exams,

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	and producing solutions that meet professional standards and industry expectations.	- Hands-On Labs and Coding Exercises	
S.4	✓ Develop the ability to apply knowledge acquired in the classroom to discussions and social activities related to web development, thereby fostering a deeper understanding of industry trends and challenges		
V.2	✓ Develop skills in managing embedded systems in advanced web applications, optimizing their use to meet specific project needs.	- Lectures - Class discussions - Assignments - projects - Project-Based Learning	Assignments, Report, Quizzes, Exams
V.4	✓ Apply agile development methodologies to manage dynamic aspects of the project, taking into account changing requirements and priorities.		Assignments, Report, Quizzes, Exams

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	Final Exam	11	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. 1.Learning Resources

Required Textbooks	• "Design Patterns: Elements of Reusable Object-Oriented Software" by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides: This book is a classic resource for learning software design patterns. It covers a wide range of patterns that can be used in Java EE applications, such as the Model-View-Controller pattern, the Factory pattern, and the Observer pattern. The book includes many code examples and discussions of best practices. http://www.javier8a.com/itc/bd1/articulo.pdf
Essential References Materials	• Oracle Java EE Documentation: Oracle provides extensive documentation for Java EE, including guides, tutorials, and reference materials. This documentation covers all aspects of Java EE, from basic concepts to advanced features and best practices. The Oracle Java EE documentation is an essential resource for understanding the nuances of the Java EE platform and how to use it effectively. • Java EE 8 Tutorial: The Java EE 8 Tutorial is a comprehensive guide to developing Java EE applications. It covers all the major components of Java EE, including Servlets, JSPs, EJBs, JPA, and more. The tutorial includes numerous code examples, exercises, and quizzes to help readers solidify their understanding of the material.
Electronic Materials	• Lecture material in PPT and pdf to sumbit it in ESIP platform • PC • Any Related material including the YouTube videos relating to JEE /.NET as : ➢ Java EE forums on Stack Overflow: Stack Overflow is a popular Q&A forum for programmers. Students can ask questions about Java EE concepts and get answers from experienced developers. They can also browse through existing questions and answers to learn from other people's experiences. ➢ Oracle Java EE Tutorial: The official Java EE tutorial from Oracle provides a comprehensive overview of Java EE and its components, including Servlets, JSPs, EJBs, JPA, and more. The tutorial includes code samples, exercises, and quizzes to help students solidify their understanding of the material. • Blackboard
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	11/10/2023

Course Title:	Mobile programming
Course Code:	CSE571/1
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Dr. AHMED KHELIFI
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1. Credit hours: **3 (1.5-0-0)**
2. Course type **a.** College ☐ Department ■ Others ☐ **b.** Fundamental ■ Transversal ☐ Optional ☐
3. Level/year at which this course is offered: 3.1/3
4. Pre-requisites for this course (if any): JAVA, XML ,Agile methods

1. Mode of Instruction (mark all that apply **not writed**)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	11	26
2	**Blended**	15		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester **not writed**)

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

B. Course Objectives and Learning Outcomes

1. 1. Course Description

This "Introduction to Android Development" course is designed to introduce students to the fundamental concepts of the Android platform. It provides a comprehensive overview of creating Android mobile applications, focusing on key aspects such as user interface, event handling, and database management with SQLite.

2. 2. Course Main Objective

- ✓ Students will gain an in-depth understanding of the Android platform, including its architecture, key components, and development ecosystem.
- ✓ Students will learn how to create attractive and functional Android user interfaces using graphical components and controls.
- ✓ Students will explore event handling in Android applications, including capturing button clicks and touch gestures.
- ✓ Students will master using the SQLite database to efficiently store and manage data in their Android applications.

3. Course Learning Outcomes not writed

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	✓ Students will gain a solid understanding of the Android operating system, its architecture, components, and the overall Android ecosystem.	PLO.K.2
1.2	✓ Students will grasp the concept of event-driven programming in Android and become proficient in capturing and handling user interactions such as button clicks and touch gestures	PLO.K3
2	**Skills**	
2.1	✓ Students will be able to develop Android applications, applying the knowledge of Android components and event handling to create functional and interactive apps.	PLO.S2
2.2	✓ Students will have the skills to design user-friendly Android app interfaces by utilizing various graphical components and XML layout design	PLO.S3
2.3	✓ Have students present their projects or findings to the class	PLO.S4
3.1	✓ Students will demonstrate the ability to capture and manage user interactions effectively, enhancing the user experience in Android applications.	PLO.S6
3.2	✓ Students will be proficient in integrating SQLite databases into Android applications, enabling data storage and retrieval.	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	☐ Chapter 1: Introduction to the Android mobile platform • Introduction to the Android system • The versions • Architecture of the Android system • Elements of an Android application • The development tool stack for Android • The Android SDK • The compilation process • Deploying an application	3
2	☐ Chapter 2: Activities • General architecture of an Activity • Life cycle of an Activity • The activity_main.xml file • The R class	6
3	☐ Chapter 3: Android HMI and graphical components • Building a GUI • Templates • The non-container graphical components	7
4	☐ Chapter 4: Controls and event management • Event management • The intents • The sequence of screens with explicit intents • Implicit intents ☐ Chapter 5: Shared Preferences : Application to the case study • Shared Preferences • Retrieving preferences • Reading shared resources • Writing to shared preferences • Preference activity • Preference categories • Types of preferences • Declaring preferences in manifest file • Preference editing activity • Preference attributes	7
	Chapter 6: SQLite • Creation and update • Data types for SQLite • Table creation with SQLite • Running Queries • Retrieving the database • Data management (Insert, Delete, Edit, Select) • Cursors The Cursor Adapter	7
Total		30

D. Teaching and Assessment not writed

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.2	Students will gain a solid understanding of the Android operating system, its architecture, components, and the overall Android ecosystem.	✓ Lecture ✓ Discussion class ✓ Code Reviews and Debugging ✓ Group Projects	✓ Practical Work (written or oral) ✓ Quizzes, Homework assignments ✓ Final Exam
PLO.K.3	Students will grasp the concept of event-driven programming in Android and become proficient in capturing and handling user interactions such as button clicks and touch gestures		
2.0	**Skills**		
PLO.S.2	Students will be able to develop Android applications, applying the knowledge of Android components and event handling to create functional and interactive apps.	✓ Lecture ✓ Discussion class ✓ Code Reviews and Debugging ✓ Group Projects	✓ , Practical Work (written or oral) ✓ Quizzes, Homework assignments Final Exam
PLO.S.3	Students will have the skills to design user-friendly Android app interfaces by utilizing various graphical components and XML layout design		
PLO.S.4	Students will demonstrate the ability to capture and manage user interactions effectively, enhancing the user experience in Android applications.		
PLO.S7	Students will be proficient in integrating SQLite databases into Android applications, enabling data storage and retrieval.		

2. Assessment Tasks for Students not writed

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	00%
2	Quizzes, Homework assignments	Random	00%
3	Final Exam	6	100%

E. Student Academic Counseling and Support not writed

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	• Horton, John. Android Programming for Beginners: Build In-Depth, Full-Featured Android 9 Pie Apps Starting from Zero Programming Experience. Birmingham, Packt Publishing, 2018. • Griffiths, Dawn, and David Griffiths. Head First Kotlin: A Brain-Friendly Guide. Sebastopol, Ca, O'reilly Media, Inc, 2019.
Essential References Materials	• Developing Secure Mobile Applications for Android http://www.isecpartners.com/files/iSEC_Securing_Android_Apps.pdf • Architectural manifesto: How to Choose a mobile platform http://www.ibm.com/developerworks/architecture/library/wi-arch23.html • What is Android http://developer.android.com/guide/basics/what-is-android.html
Electronic Materials	• Lecture material in PPT • Blackboard
Other Learning Materials	NA

2. Facilities Required not writed

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 not writed

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 not writed

Council / Committee	Computer Engineering Council
Date	11/10/2022

Course Title:	**Distributed database**
Course Code:	CSE572/1
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 (1.5-0-0)**

2. Course type

a. University ☐ College ☐ Department ■ Others ☐

b. Required ■ Elective ☐

3. Level/year at which this course is offered: 3.1/3

4. Pre-requisites for this course: CSE323, CSE431, Networks and protocols

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self-study	Total workload
1	**Traditional classroom**	…..	11	26
2	**Blended**	15		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester)

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

B. Course Objectives and Learning Outcomes

Course Description

In this course we will focus on the essentials of the design of a distributed database and the fragmentation techniques in order to establish the allocation scheme of a distributed database. Introduce the main concepts of Distributed Query Processing and Optimization. Present the transaction concurrency problem, access concurrency and reprise.

Course Main Objective

- ✓ Know and introduce the main notions of distributed databases
- ✓ Understand the different database architectures
- ✓ Develop a Designing distributed database
- ✓ Identify the basic concepts of distributed Query Processing and Optimization
- ✓ Master the concept of transaction
- ✓ The skill to manage access concurrency and reprise
- ✓ Mange the design problems and ethics related to distributed database
- ✓ Conclude effectively the basics, principles, and theories related to distributed database with other disciplines

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Know and introduce the main notions of distributed databases	PLOK.2
3.1	Understand the different database architectures	PLOK.3
2	**Skills**	
1.1	Develop a Designing distributed database	PLOS.1
2.1	Identify the basic concepts of distributed Query Processing and Optimization	PLO.S2
3.1	Master the concept of transaction	PLO.S3
4.1	The skill to manage access concurrency and reprise	PLO.S4
6.1	Mange the design problems and ethics related to distributed database	PLO.S6
7.1	Conclude effectively the basics, principles, and theories related to distributed database with other disciplines	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
1	Know and introduce the main notions of distributed databases	1.5
2	Designing a distributed database	1.5
3	Fragmentation Techniques	1.5
4	The basic concepts of distributed Query Processing and Optimization	1.5
5	Access concurrency and reprise	1.5
9	MidTerm	2
Total		7.5

D. Tutorial work Content

No	List of Topics	Contact Hours
1	Tutorial 1: Distributed database design	3
2	Tutorial 2: Distributed Query Processing and Optimization	2
3	Tutorial 3: Access concurrency and reprise	2.5
Total		7.5

E. 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.2	Know and introduce the main notions of distributed databases	Lecturing	Assignments, Quizzes , Exams,
PLOK.3	Understand the different database architectures	Lecturing	Assignments, Quizzes , Exams,
2.0	**Skills**		
PLOS.1	Develop a Designing distributed database	Lecturing Tutorial	Assignments, Quizzes , Exams,
PLOS.2	Identify the basic concepts of distributed Query Processing and Optimization	Lecturing Tutorial	Assignments, Quizzes , Exams,
PLOS.3	Master the concept of transaction	Lecturing Tutorial	Assignments, Quizzes , Exams,
PLOS.4	The skill to manage access concurrency and reprise	Lecturing Tutorial	Assignments, Quizzes , Exams,
PLOS.6	Mange the design problems and ethics related to distributed database	Lecturing Tutorial	Assignments, Quizzes , Exams,
PLOS.7	Conclude effectively the basics, principles, and theories related to distributed database with other disciplines	Lecturing Tutorial	Assignments, Quizzes , Exams,

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%
5	Final Exam	6	100%

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
2- Office hours 3- Blackboard interface

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Rim Moussa, Distributed Database Management Systems & Distribution Mechanisms with Oracle, URL: http://ceria.dauphine.fr/Rim/SupportBDR
Essential References Materials	- D. Donsez, Distribution, Replication, Nomadism, Heterogeneity in DBMSs. - Dan VODISLAV, Advanced databases Access concurrency and recovery. - S. Spaccapietra, C. Vingenot, Distributed databases.
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 (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	11/10/2023

Course Title:	**Project mobile programming**
Course Code:	CSE573/1
Program:	Master Degree In Computer Engineering
Department:	Computer Engineering
Course coordinator:	Mr, Ahmed kHLIFI
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: 3.1/3
4. Pre-requisites for this course (if any): Basic knowledge of Java programming, Android Studio development environment installed.
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**	…..	11	26
2	**Blended**	15		
3	**E-learning**	.....		
4	**Distance learning**	.....		
5	**Other ()**	.....		

2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	
2	**Laboratory/Studio**	-
3	**Tutorial**	5
4	**Others** (Project)	10
	Total	15

B. Course Objectives and Learning Outcomes

Course Description

This Task Management with Android course is designed to introduce students to the development of mobile applications using the Android platform. During this program, students will learn the essential skills to create a mobile task management application, combining basic Android development concepts, user-friendly user interface design, and data management

Course Main Objective

At the end of the module, the student should be able to:

- ✓ Understand the fundamentals of Android, such as Intents, Activities, Fragments, and Services
- ✓ Gain a basic understanding of mobile application development, including the specifics of the Android platform.
- ✓ Know the requirements and steps to publish an application on platforms
- ✓ Master the use of common Android views to create an interactive user interface.
- ✓ Set up navigation between different application activities
- ✓ Present orally and in writing the key concepts of mobile development, the technical challenges, the solutions implemented, and the results obtained
- ✓ Perform unit tests to verify that the application is working properly.
- ✓ Collaborate with team members to propose and implement solutions to real-life mobile application challenges.

1. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
3.1	✓ Understand the fundamentals of Android, such as Intents, Activities, Fragments, and Services	PLO.K2
3.2	✓ Gain a basic understanding of mobile application development, including the specifics of the Android platform.	
3.3	✓ Know the requirements and steps to publish an application on platforms	
2	**Skills**	
2.1	✓ Master the use of common Android views to create an interactive user interface.	PLO.S2
4.1	✓ Present orally and in writing the key concepts of mobile development, the technical challenges, the solutions implemented, and the results obtained	PLO.S4
5.1	✓ Collaborate with team members to propose and implement solutions to real-life mobile application challenges.	PLO.S5
6.1	✓ Analyze the challenges and opportunities presented by the integration of embedded systems in diverse contexts, such as smart homes, healthcare, transportation, and industrial applications.	PLO.S6
7.1	✓ Analyze and evaluate the static aspects of software design, including architecture, data models, and user interfaces, with an emphasis on achieving well-structured and maintainable mobile applications	PLO.S7

C. Course Content

No	List of Topics	Contact Hours
	Project synopsis: The project consists of developing an Android application for the activities of the GAFSA Higher School of Engineers (events, training, news, etc.). The application receives this data from an external server, from a web platform with a user interface to add data (event, etc.). The application is accessible offline, the data from the Web Service is recorded in an internal database so that it can be consulted in the event of no connectivity. For events outside of school, we offer the possibility of consulting the itinerary of the location of the event. The project must respect coding recommendations and offer a better user experience, fluid and easy to use.	
	Step 0: Team training and choice of topics II- Step 1: Needs Analysis and Specifications III- Graphic design and Wireframing IV- Creation of models under Android Studio V- Implementation of the Web Server part 1- Design and implementation of the database 2- Creation of Web services VI- Implementation of the client-mobile functional part VII- Implementation of the local SQLite database.	5
Total		15

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.K2	✓ Understand the fundamentals of Android, such as Intents, Activities, Fragments, and Services ✓ Gain a basic understanding of mobile application development, including the specifics of the Android platform. ✓ Know the requirements and steps to publish an application on platforms	- Class discussions - Assignments - Projects	Assignments, , Report, Homework assignments
2.0	**Skills**		
PLO.S2	✓ Master the use of common Android views to create an interactive user interface.	- Class discussions - Assignments - Projects	Assignments, , Report, Homework assignments
PLO.S4	✓ Present orally and in writing the key concepts of mobile development, the technical challenges, the solutions implemented, and the results obtained		
PLO.S5	✓ Collaborate with team members to propose and implement solutions to real-life mobile application challenges.		
PLO.S6	✓ Analyze the challenges and opportunities presented by the integration of embedded systems in diverse contexts, such as smart homes, healthcare, transportation, and industrial applications.		
PLO.S7	✓ Analyze and evaluate the static aspects of software design, including architecture, data models, and user interfaces, with an emphasis on achieving well-structured and maintainable mobile applications		

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 Counselling 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] François Bonneville, "État de l'art de développement d'applications mobiles", ARICIA, laboratoire d'Info. de l'université de Franche Compté [2] Site officiel du développeur Android: developer.android.com, consulté le 04/2015 [3] Microsoft Patterns and Practices, « Mobile Application Architecture Guide: Application Architecture Pocket Guide », 2008 [4] Ketan Thakkar, « Difference between MVC vs. MVP vs. MVVM », 11 septembre 2014, url:
Essential References Materials	Resource Sites http://blogs.k10world.com/technology/difference-betweenmvc-vsmvp-vs-mvvm
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 (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	11/10/2022