Subjects Modules for S4

Software Engineering

Semester 2 Year 2

U4.1 Advanced Web Technologies

JEE Framework (Spring Boot)

Module designation	**Advanced Web Technologies**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.1
Subtitle, if applicable	
Courses, if applicable	**JEE Framework (Spring Boot)**
Semester(s) in which the module is taught	**Semester 4**
Person responsible for the module	Dept Head
Lecturer	Mr. Nassim Bahri
Language	French
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours practical workshop in Lab/ semester 21 hours of Supervised projects on Campus/ semester
Workload	Total 77 hours/ Semester (35 hours of Self Study)
Credit points	3
Requirements according to the examination regulations	- Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	• Proficiency in Java programming language. • Understanding of web development concepts (HTML, CSS, HTTP). • Familiarity with SQL and relational databases
Module objectives/intended learning outcomes	**Course Objectives:** The objective of this course is to equip students with the skills to develop modern, production-ready Java web applications using the Spring Boot framework. The course emphasizes rapid development, auto-configuration, RESTful API creation, data persistence with Spring Data JPA, and best practices for building scalable and maintainable applications. **Learning outcomes:** • Spring Boot Mastery: Mastering Spring Boot from foundational to advanced levels. • RESTful API Development: Designing and building robust RESTful APIs using Spring Boot. • Database Integration: Integrating Spring Boot applications with relational databases effectively. • Security Implementation: Implementing advanced security measures for Spring Boot applications.

Content	**Chapter 1: Introduction to Spring Boot** 1. Spring Boot features and advantages 2. Project setup and initialization. 3. Spring Boot application structure. **Chapter 2: RESTful API Development with Spring Boot** 1. Designing RESTful endpoints. 2. Building RESTful controllers. 3. Request and response handling. **Chapter 3: Database Integration with Spring Boot** 1. Data access with Spring Data JPA. 2. Database configuration and connection. 3. CRUD operations with Spring Boot and Hibernate. **Chapter 4: Security in Spring Boot** 1. Authentication and authorization. 2. OAuth 2.0 and JWT for secure APIs. 3. Implementing security best practices. **Chapter 5: Microservices with Spring Boot** 1. Microservices architecture and principles. 2. Building microservices with Spring Boot. 3. Service discovery and communication. ***Group Projects are proposed***
Study and examination requirements and forms of examination	Continuous Assessment 50% + Evaluation of the final report of project (50%) (Report for each workshop/Project required)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online(Moodle ULT) Video projection
Reading list	1. "Spring Boot in Action" by Craig Walls. 2. "Spring Microservices in Action" by John Carnell and Ronnie Mitra. 3. "Mastering Spring Boot 2.0" by Greg Turnquist. 4. Spring Boot official documentation and guides (https://spring.io/guides).

U4.1 Advanced Web Technologies

Server-side JavaScript (Node JS)

Module designation	**Advanced Web Technologies**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.1
Subtitle, if applicable	
Courses, if applicable	**Server-side JavaScript (Node JS)**
Semester(s) in which the module is taught	**Semester 4**
Person responsible for the module	Dept Head
Lecturer	Mr. Anis Chedli
Language	French
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours practical workshop in Lab/ semester 21 hours of Supervised projects on Campus/ semester
Workload	Total 77 hours/ Semester (35 hours of Self Study)
Credit points	3
Requirements according to the examination regulations	- Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	• JavaScript basics. • Understanding of web development concepts (HTML, CSS, HTTP). • Familiarity with SQL and relational databases
Module objectives/intended learning outcomes	**Objective:** The objective of the course is to introduce students to the content and skills necessary to understand and use the Node.js architecture, resources and programming model. **Learning Outcomes:** At the end of this course students will be able to: 1- Describe the Node.js architecture. 2- Understand the differences and implications of handling non-blocking software. 3- Define Node-based sites. 4- Learn how to manage Node configuration tools, such as NPM. 5- Handle input/output data and information persistence mechanisms. 6- Manage and program the event cycles on which the operation

	of Node is based. 7- Learn to program the routing of requests to the server. Manage and implement the socket creation libraries.
Content	**1. Introduction to Node.js** • Background and environment creation • Frameworks and IDE support • Node.js environment tools and other related tools **2. JavaScript and the module system** • Some JavaScript features • The module system • Using third-party modules • Creating third-party modules • Accessing files using the fs module • Basic read/write operations • Other file system operations **3. Express** • Objectives of Express • Installing and using Express • Creating a simple REST API • Templating **4. Building the back-end** • TCP communications • Web Socket concepts • Socket.IO solutions • Building clients and servers **5. Creating REST services** • Introduction to REST services • The HTTP protocol and verbs • Creating a basic REST server • Native storage alternatives • Other storage alternatives **6. Extending Node.js with JavaScript APIs** • The core JavaScript (and ECMAScript) APIs • Geolocation • Local and session storage • Web Workers

Study and examination requirements and forms of examination	Continuous Assessment 50% + Evaluation of the final report of project (50%) (Report for each workshop/Project required)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online(Moodle ULT) Video projection
Reading list	1. Advanced Node.js Development: Master Node.js by building real-world applications by Andrew Mead Packt Publishing, 2018. 2. Node.js: Novice to Ninja by Craig Buckler, sitepoint, 2022. 3. Get Programming with Node.js by Jonathan Wexler, MANNING, 2019.

U4.2: Software Engineering I

Software Engineering

Module designation	**Software Engineering**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.2
Subtitle, if applicable	
Courses, if applicable	**Software Engineering**
Semester(s) in which the module is taught	Semester 4
Person responsible for the module	Dept Head
Lecturer	Ms. Kadria Ezzine
Language	French
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours of Supervised projects on Campus/ semester
Workload	Total 42 hours/ Semester (21 hours of Self Study)
Credit points	3
Requirements according to the examination regulations	- Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	Software Lifecycle
Module objectives/intended learning outcomes	**Objectives :** The agile methods course will address what agile methods are, how they are implemented (correctly), and their impact on software engineering. A variety of agile methods will be described, but the focus will be on Scrum and Extreme Programming. Issues associated with planning and controlling agile projects, along with the implications of empowered teams on the customer-supplier dynamic, will give a fuller picture of how the agile practices are realized. The course will conclude with a discussion of some of the issues facing organizations adopting agile methods. **Student Learning Objectives/Outcomes** 1. Ability to apply critical thinking in analyzing a software engineering method. 2. Ability to analyze the tradeoffs in selecting a software engineering method. 3. Ability to understand the practices and philosophies of agile methods.

	4. Ability to understand and apply Scrum. 5. Ability to understand and apply Extreme Programming. 6. Ability to tailor an agile method to the needs of the project
Content	I. **Agile Manifesto and Principles** II. **Scrum Overview** III. **Extreme Programming Overview** IV. **XP Corollary Practices** V. **Agile Management Practices** VI. **Risk Management and the Customer in Agile Methods** VII. **Crystal Clear** VIII. **Lean Development and Kanban** IX. **Agile Engineering Practices** X. **Tailoring and Improving Agile Methods** XI. **Miscellaneous Agile Methods** XII. **Challenges in Adopting Agile Method** XIII. **Tradeoffs for Software Engineering Methods** XIV. **Agile Methods and Software Process Frameworks**
Study and examination requirements and forms of examination	Continuous Assessment (50%) + Project (50%) (Report for each workshop/Project required)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online(Moodle ULT) Video projection
Reading list	1. K. Beck and C. Andres, Extreme Programming Explained: Embrace Change, 2nd Edition, 2004. 2. B.W. Boehm and R. Turner, Balancing Agility and Discipline: A Guide for the Perplexed, 2004. 3. Cockburn, Crystal Clear: A Human-Powered Methodology for Small Teams, 2004. 4. M. Cohn, Succeeding with Agile: Software Development Using Scrum, 2009. 5. H. Kniberg, Scrum and XP from the Trenches, 2007. *6.* C. Larman and B. Vodde, Scaling Lean & Agile Development: Thinking and Organizational Tools for Large-Scale Scrum, 2008.

U4.2: Software Engineering I

Software Validation and Verification (ISTQB)

Module designation	**Software Engineering**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.2
Subtitle, if applicable	
Courses, if applicable	**Software Validation and Verification (ISTQB)**
Semester(s) in which the module is taught	Semester 4
Person responsible for the module	Dept Head
Lecturer	Mr. Mohamed Hrizi
Language	French
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours of Classroom Lecture/ Semester 21 hours for Workshop in Lab
Workload	Total 77 hours/ Semester (35 hours of Self Study)
Credit points	2
Requirements according to the examination regulations	- Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	Proficiency in Java programming language
Module objectives/intended learning outcomes	**Course Objectives:** The objective of this course is to provide students with a comprehensive understanding of software testing principles based on the ISTQB (International Software Testing Qualifications Board) Foundation Level syllabus. The course emphasizes the concepts of validation and verification, types of testing, test design techniques, testing throughout the software lifecycle, and test management practices, preparing students for real-world software quality assurance and ISTQB certification. **Learning Outcomes:** By the end of this course, students will be able to: • Understand the principles of software validation and verification. • Apply different test levels and types across the software development lifecycle.

	• Use static and dynamic testing techniques effectively. • Design and execute test cases using industry-standard methodologies. • Manage test activities including planning, monitoring, and reporting. • Utilize test tools and understand their role in automation and efficiency
Content	**Chapter 1: Fundamentals of Software Testing** • Purpose, principles, and process • Verification vs. validation **Chapter 2: Testing Throughout the Software Lifecycle** • Testing in different SDLC models (Waterfall, Agile, V-model) • Levels of testing: unit, integration, system, acceptance **Chapter 3: Static Techniques** • Reviews, walkthroughs, inspections • Static analysis tools **Chapter 4: Test Design Techniques** • Black-box (equivalence partitioning, boundary value analysis) • White-box (statement, decision coverage) • Experience-based testing **Chapter 5: Test Management** • Test planning, estimation, monitoring • Risk-based testing • Configuration and defect management **Chapter 6: Tool Support for Testing** • Test automation, management, performance testing tools • CI/CD integration
Study and examination requirements and forms of examination	Written Mid-Term Exam (40%) + Written Final Exam (60%)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online(Moodle ULT) Video projection

Reading list	1. ISTQB® Certified Tester Foundation Level Syllabus – www.istqb.org 2. Rex Black & Dorothy Graham – Foundations of Software Testing: ISTQB Certification, Cengage Learning 3. Paul Ammann & Jeff Offutt – Introduction to Software Testing, Cambridge University Press *4.* Ron Patton – Software Testing, Pearson

U4.2: Software Engineering I

Collaborative Work Tools (git)

Module designation	**Software Engineering**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.2
Subtitle, if applicable	
Courses, if applicable	**Collaborative Work Tools (git)**
Semester(s) in which the module is taught	Semester 4
Person responsible for the module	Dept Head
Lecturer	Ms. Salma Bouazizi
Language	French
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours of Supervised projects on Campus/ semester
Workload	Total 42 hours/ Semester (21 hours of Self Study)
Credit points	2
Requirements according to the examination regulations	- Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	Software Lifecycle
Module objectives/intended learning outcomes	**Objectives:** The objective of this course is to introduce students to modern collaborative software development practices using Git. It focuses on version control, branch management, collaborative workflows, and integrating Git with platforms like GitHub or GitLab. By the end of the course, students will be able to contribute effectively to team-based development projects using industry-standard tools and practices. **Learning Outcomes:** By the end of this course, students will be able to: • Understand the principles of version control and the Git architecture • Use Git commands to manage code changes, branches, and collaboration • Apply branching strategies and resolve merge conflicts

	effectively • Collaborate using platforms like GitHub or GitLab • Contribute to open-source or team-based projects using pull request workflows • Integrate Git into professional development environments and CI/CD pipelines
Content	**Chapter 1: Introduction to Version Control** • Concepts of version control and history • Centralized vs. distributed systems **Chapter 2: Getting Started with Git** • Installing and configuring Git • Creating repositories, staging, committing **Chapter 3: Branching and Merging** • Working with branches • Merging strategies and resolving conflicts **Chapter 4: Remote Repositories and Collaboration** • Cloning, pushing, pulling • Working with GitHub / GitLab **Chapter 5: Collaboration Workflows** • Git Flow, Forking, Pull/Merge Requests • Team collaboration strategies **Chapter 6: Advanced Git Features** • Rebasing, cherry-picking, stashing • Tags and releases **Chapter 7: Issue Tracking and Continuous Integration Basics** • Linking Git with issue trackers • Git in CI/CD pipelines
Study and examination requirements and forms of examination	Continuous Assessment (50%) + Project (50%)(Report for each workshop/Project required)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online(Moodle ULT) Video projection

Reading list	1. Chacon, Scott & Straub, Ben – Pro Git, Apress (available free at git-scm.com) 2. Loeliger, Jon & McCullough, Matthew – Version Control with Git, O'Reilly *3.* Git official documentation – https://git-scm.com/doc

U4.3 Software Architecture

Service Oriented Architecture (SOA)

Module designation	**Software Architecture**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U5.2
Subtitle, if applicable	
Courses, if applicable	**Service Oriented Architecture (SOA)**
Semester(s) in which the module is taught	Semester 4
Person responsible for the module	Dept Head
Lecturer	Mr. Nassim Bahri
Language	English
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours practical workshop in Lab/ semester 21 hours of Supervised projects on Campus/ semester
Workload	Total 77 hours/ Semester (35hours of Self Study)
Credit points	3
Requirements according to the examination regulations	- Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	Software Architecture, JEE, .NET
Module objectives/intended learning outcomes	**Objectives:** To gain understanding of the basic principles of service orientation To learn service-oriented analysis techniques To learn technology underlying the service design To learn advanced concepts such as service composition, orchestration and Choreography To know about various WS- * specification standards **Learning Outcomes:** After the completion of this course student will be able to: 1. Understand primary concepts of SOA 2. Know the integration of SOA technological points with Web Services 3. Implement of SOA in development cycle of Web Services.
Content	**I. Introduction To distributed Computing and SOA** **II. Services Fundamental and Standard** **III. Principles of Service-Oriented Architecture** **IV. SOA and WS-* Extension**

	V. Principle of Service Oriented Computing **VI. SOA Platforms**
Study and examination requirements and forms of examination	Continuous Assessment 50% + Evaluation of the final report of project (50%) (Report for each workshop/Project required)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online(Moodle ULT) Video projection
Reading list	1. SOA Using Java™ Web Services by Mark D. Hansen 2. SOA Design Pattern By Thomas Erl PHI 3. Web service contract Design & Versioning for SOA by Thomas Erl PHI 4. SOA with .NET by Rajbalasubhramaniam Prentice Hall

U4.3: Software Architecture

Software Architecture and Design Patterns

Module designation	**Software Architecture**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.3
Subtitle, if applicable	
Courses, if applicable	**Software Architecture**
Semester(s) in which the module is taught	Semester 4
Person responsible for the module	Dept Head
Lecturer	Mr. Imed Ben Boukhatem
Language	French
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours of Classroom Lecture/ Semester 21 hours of Workshop in Lab/ Semester
Workload	Total 77 hours/ Semester (35hours of Self Study)
Credit points	3
Requirements according to the examination regulations	- Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	Knowledge of software development life cycles -some familiarity with modern software engineering concept
Module objectives/intended learning outcomes	**Objectives:** The course presents the concepts and principles of software architecture. It introduces methods and techniques to design and describe software architectures and explains the architectural concepts underpinning the structure and behavior of modern classes of software systems, such as service-oriented systems, cloud-based systems and micro-services. The course furthermore discusses typical tasks and responsibilities of software architects in practice. **Learning Outcomes:** Upon completion of the course, students should be able to: • explain and apply the fundamental principles and concepts of software architecture, • explain and apply the tasks and duties of software architects in the software development process • explain and describe the architecture of a software system in terms of principle design decisions and the systems fundamental structures and behavior • explain different classes of software systems from a software architectural point of view and apply this knowledge to compare/contrast different software architecture alternatives

	with each other - critically evaluate the suitability of a software architecture of a software system about the desired functionality and quality attributes of the system - design appropriate software system architectures and communicate the design to the systems stakeholders.
Content	I. **Fundamental software architecture concepts and principles** II. **Description and communication of software architectures through architectural views** III. **Software architecture patterns** IV. **Software architecture design principles** V. **Architecting software systems for quality attributes, such as dependability, efficiency, and security** VI. **Architectures of modern software systems, such as SOA, Webservices, Microservices, and cloud-based systems** VII. **Software architecture and the Implementation and deployment process, particularly continuous integration** VIII. **Case Studies**
Study and examination requirements and forms of examination	Written Mid-term Exam (25%) + Practical Exam (25%) + Written Final Exam (50%) (Report for each workshop required)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online(Moodle ULT) Video projection
Reading list	1. Len Bass, et al., Software Architecture in Practice, Addison Wesley, 2nd. Edition 2003. [Hofmeister 2000] Christine Hofmeister, et al., Applied Software Architecture, Addison-Wesley, 2000. 2. Clements, P., et al., Documenting Software Architectures: Views and Beyond, AddisonWesley, 2003. 3. Gluch, D., Feiler. P., and Hudak. J., The Architecture Analysis & Design Language (AADL): An Introduction, CMU/SEI-2006-TN-011, Carnegie Mellon University, February 2006.

U4.4 Data Science

Machine Learning

Module designation	**Data Science**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.4
Subtitle, if applicable	
Courses, if applicable	**Machine Learning**
Semester(s) in which the module is taught	**Semester 4**
Person responsible for the module	Dept Head
Lecturer	Mr. Mehdi Kaabi
Language	English
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours practical workshop in Lab/ semester 21 hours of Supervised projects on Campus/ semester
Workload	Total 84 hours/ Semester (42 hours of Self Study)
Credit points	3
Requirements according to the examination regulations	- Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	Basic knowledge of artificial intelligence / Data Mining. Python programming
Module objectives/intended learning outcomes	**Course Objectives:** Machine Learning (ML) is basically that field of computer science with the help of which computer systems can provide sense to data in much the same way as human beings do. In simple words, ML is a type of artificial intelligence that extract patterns out of raw data by using an algorithm or method. The key focus of ML is to allow computer systems to learn from experience without being explicitly programmed or human intervention. **Learning outcomes:** Student will learn: • The difference between the two main types of machine learning methods: supervised and unsupervised • Supervised learning algorithms, including classification and regression • Unsupervised learning algorithms, including Clustering and Dimensionality Reduction • How statistical modeling relates to machine learning and

	how to compare them - Real-life examples of the different ways machine learning affect society
Content	**Module 1 - Introduction to Machine Learning** Applications of Machine Learning Supervised vs Unsupervised Learning Python libraries suitable for Machine Learning **Module 2 - Regression** Linear Regression Non-linear Regression Model evaluation methods **Module 3 - Classification** K-Nearest Neighbour Decision Trees Logistic Regression Support Vector Machines Model Evaluation **Module 4 - Unsupervised Learning** K-Means Clustering Hierarchical Clustering Density-Based Clustering **Module 5 - Recommender Systems** Content-based recommender systems Collaborative Filtering
Study and examination requirements and forms of examination	Continuous Assessment (50%) + Project (50%)(Report for each workshop/Project required)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online(Moodle ULT) Video projection
Reading list	1. Marc Peter Deisenroth, A. Aldo Faisal, Cheng Soon Ong, Mathematics for Machine Learning, Cambridge University Press (23 April 2020) 2. Tom M. Mitchell- Machine Learning - McGraw Hill Education, International Edition 3. Aurélien Géron Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, O'Reilly Media, Inc. 2nd Edition 4. Ian Goodfellow, Yoshoua Bengio, and Aaron Courville Deep Learning MIT Press Ltd, Illustrated edition Christopher M. Bishop Pattern Recognition and Machine Learning - Springer, 2nd edition 5. Trevor Hastie, Robert Tibshirani, and Jerome Friedman - The Elements of Statistical Learning: Data Mining, Inference, and Prediction - Springer, 2nd ed

U4.4: Data Science

Business Intelligence (BI)

Module designation	**Data Science**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.4
Subtitle, if applicable	
Courses, if applicable	**Business Intelligence (BI)**
Semester(s) in which the module is taught	Semester 4
Person responsible for the module	Dept Head
Lecturer	Mr. Nassim Bahri
Language	English
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours practical workshop in Lab/ semester 21 hours of Supervised projects on Campus/ semester
Workload	Total 84 hours/ Semester (42 hours of Self Study)
Credit points	3
Requirements according to the examination regulations	- Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	Object Oriented Design Database and SQL fundamentals
Module objectives/intended learning outcomes	**Objectives:** The objective of this course is to equip students with the knowledge and practical skills to design, implement, and use Business Intelligence (BI) solutions. The course focuses on the principles of data warehousing, data modeling, ETL processes, and data visualization, with hands-on experience using Power BI for dashboard creation and data analysis. **Learning outcomes:** By the end of this course, students will be able to: • Understand the role of BI and data warehousing in business decision-making • Design and implement a data warehouse using dimensional modeling techniques • Perform ETL operations and prepare data for analytics • Use Power BI to connect, clean, and model data • Create dynamic and interactive reports and dashboards • Analyze and communicate data insights effectively using visualizations

Content	**Chapter 1: Introduction to Business Intelligence** • BI concepts, architecture, and value in decision-making • OLTP vs. OLAP systems **Chapter 2: Data Warehousing Fundamentals** • Data warehouse design principles (Inmon vs. Kimball) • Star and snowflake schemas **Chapter 3: ETL Process (Extract, Transform, Load)** • Data integration and transformation • Tools and techniques for ETL **Chapter 4: Dimensional Modeling** • Fact tables, dimension tables, surrogate keys • Slowly Changing Dimensions (SCD) **Chapter 5: Introduction to Power BI** • Connecting data sources • Data transformation using Power Query **Chapter 6: Data Modeling and DAX in Power BI** • Relationships, measures, calculated columns • Introduction to DAX formulas **Chapter 7: Building Interactive Dashboards** • Designing reports and dashboards • Filters, slicers, drilldowns
Study and examination requirements and forms of examination	Continuous Assessment (50%) + Project (50%) (Report for each workshop/Project required)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online(Moodle ULT) Video projection
Reading list	1. Ralph Kimball & Margy Ross – The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling, Wiley 2. Cindi Howson – Successful Business Intelligence: Unlock the Value of BI & Big Data, McGraw-Hill 3. Alberto Ferrari & Marco Russo – The Definitive Guide to DAX, Microsoft Press 4. Microsoft Learn – Power BI Documentation – https://learn.microsoft.com/en-us/power-bi/

U4.5 Languages and Management II

Business Management

Module designation	**Languages and Management II**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.5
Subtitle, if applicable	
Courses, if applicable	**Business Management**
Semester(s) in which the module is taught	Semester4
Person responsible for the module	Dept Head
Lecturer	Ms. Yosra Saidi
Language	French
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours of Classroom Lecture/ Semester
Workload	Total 42 hours/ Semester (21hours of Self Study)
Credit points	1.5
Requirements according to the examination regulations	- Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	
Module objectives/intended learning outcomes	**Objectives:** This course has three main objectives: - Allow the student to know the company and the nature of its relationship with the environment. - Introduce him to the fundamental principles of management and management - Prepare him for the various management specialties (Marketing, Finance, Production Management, Management, Human Resources Management).
Content	**Chapter 1: management and the manager** 1. Management 2. The manager 3. The evolution of management **Chapter 2: The Company** 1. Definition 2. The role of the Company 3. The different shapes

	Chapter 3: The business environment 1. Definition 2. Dimensions of the environment 3. ESE-Envt interactions and its evaluation **Chapter 4: Business functions** **1.** Supply management 2. Production management 3. The marketing function 4. Financial management **Practical activities:** **Competency approach or framework**
Study and examination requirements and forms of examination	Written Mid-Term Exam (40%) + Written Final Exam (60%)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online(Moodle ULT) Video projection
Reading list	1. Zouaoui M. et Karoui S. (1999): Le management, processus de gestion et fonctions de l'entreprise, Editions Clés. 2. KorbiK. (2006) : Introduction à la gestion, centre de publication universitaire. **3.** Kotler et Dubois (2002) : Marketing management, Dunod.

U4.5 Languages and Management II

English TOIEC II

Module designation	Languages and Management II
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.5
Subtitle, if applicable	
Courses, if applicable	English TOEIC II
Semester (s) in which the module is taught	Semester 4
Person responsible for the module	
Lecturer	Ms. Nadia Zardi
Language	English
Relation to curriculum	Integrated course module
Type of teaching, contact hours	42 hours Lecture/ semester
Workload	Total 77 hours/semester (35 hours of Self-Study/semester)
Credit points	1.5
Requirements according to the examination regulations	Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	General English, English TOEIC 1
Module objectives/intended learning outcomes	**Objectives:** 1. Pass the TOEIC test 2. Grasp most of all listening and reading tactics **Learning Outcomes:** Students will be able to: 1. Demonstrate how well they understand spoken English. 2. Focus on their learning, think actively, monitor their comprehension of different types of texts and demonstrate appropriate reading strategies.

Content	**Classroom Lecture <u>(Continue from Semester 3)</u>** **Part I: Listening** **Chapter 1. Photographs** Distractor 1: Sound Confusion Distractor 2: Verb/Noun Confusion Distractor 3: Non-Itemed Pictures Distractor 4: Action /State confusion **Mini Test** **Chapter 2. Question and Response** Distractor 1: Repeating words Distractor 2: Related words Distractor 3: Wrong Subject Distractor 4: Wrong Tense Answering Wh-Questions with Yes or No Distractor 5: Negative Questions Distractor 6: Tag Questions **Mini Test** **Chapter 3. Conversations (two or more speakers)** Distractor 1: Topic Questions Distractor 2: Detail Questions Distractor 3: Inference Questions Distractor 4: Types of situations **Mini Test** **Chapter4. Talks (one single speaker)** Distractor 1: Topic Questions Distractor 2: Speaker/Audience Questions Distractor 3: Detail Questions Distractor 4: Types of Talks **Mini Test** **Part II. Reading** **Chapter 1. Incomplete Sentences** Vocabulary Based Items

	Grammar Based Items **Mini Test** **Chapter 2. Text Completion** Grammar Concepts **Mini Test** **Chapter 3. Reading Comprehension** Question Types Passage Types Multiple passage Items **Mini Test**
Study and examination requirements and forms of examination	Continuous assessment through mini test A common test for all types of Engineering by the end of each semester Listening Exam (Semester I): 100 questions /multiple choice: 45minutes. Listening and Reading Exam (Semester II): 200 questions/ multiple-choice 120 minutes.
Media employed	Textbook/ hard copies for Classroom
Reading list	1. Dooley, J. (2019). Prepare and Practice for the TOEIC Test. Express Publishing. 2. G rant, T. (2007). Tactics for Toeic. Oxford University Press

U4.6 Project

End of Year Project

Module designation	**Project**
Module level, if applicable	Year 2, Semester 2
Code, if applicable	U4.6
Subtitle, if applicable	
Courses, if applicable	**End of Year Project**
Semester (s) in which the module is taught	Semester 4
Person responsible for the module	Dept Head
Lecturer	Departments teaching staff members
Language	French
Relation to curriculum	Compulsory module
Type of teaching, contact hours	21 hours of Supervision on Campus/ semester
Workload	Total 63 hours/semester (42 hours of Self-Study/semester)
Credit points	2
Requirements according to the examination regulations	Minimum attendance rate: 80% of the total contact hours >20 % of nonattendance = elimination for exams
Recommended prerequisites	Software Programming and Design/Scientific Writing
Module objectives/intended learning outcomes	This exercise will help student to apply knowledges and Skills to work and present a basic project. **Objectives:** 1. Sizing and choice of solution 2. Project studies: functional and structural analysis, design (preparation of technical files) 3. Design Simulation using appropriate software & tools 4. Write a project report and do a presentation **Learning Outcomes:** Students will be able to: 1. Know how to manipulate a project through his steps. 2. Cooperate and work in teams.

Content

List of Projects 2023-2024

Development of Applications

Project 1: AI-Powered Customer Support Chatbot
Build an intelligent chatbot that answers customer questions and handles basic support requests using natural language processing (NLP).

Key Features:

- Integration with GPT-based APIs (e.g., OpenAI, Hugging Face),
- Live chat UI for real-time conversation,
- Dashboard for tracking customer satisfaction and unanswered questions.

Project 2: Automated Resume Screening System

Develop an AI tool that automatically analyzes and ranks job applications based on keywords, experience, and skills matching using machine learning.

Key Features:

- Integration with NLP models for semantic understanding,
- PDF document parsing,
- Admin dashboard to review rankings and download filtered resumes.

Project 3: Smart Content Generator for E-commerce

Build an AI-driven tool that automatically generates product descriptions, advertisements, or blog content for e-commerce websites.

Key Features:

- Integration with text-generation APIs (GPT, Claude, Gemini, etc.),
- Options for tone/style customization,
- Batch content generation for multiple products.

Project 4: AI-Based Image Recognition and Inventory Management

Create a mobile or web application where users can upload images of products, and the system automatically classifies and updates inventory records.

	Key Features: • Integration with Computer Vision APIs (Google Vision, AWS Rekognition), • Inventory database linked to image classifications, • Report generation for stock levels. **Project 5: Video Summarization Platform** Build a platform that allows users to upload long videos and automatically generates short summaries or highlight reels using AI. Key Features: • Integration with video analysis and summarization APIs, • Basic video editing features (cut, trim, export), • Cloud storage for uploads and processing. **Project 6: Business Intelligence Dashboard Enhanced by Predictive Analytics** Develop a BI platform where users can upload business data and receive automated predictive insights (e.g., sales forecasts, churn risk). Key Features: • Integration with AI prediction APIs or build custom ML models, • Interactive dashboards (Power BI-like, custom built), • Report generation and export.
Study and examination requirements and forms of examination	Work carried out during the year (20%) + Prototype realization (30%) + Evaluation of the final report of project (50%)
Media employed	Course Material (Hard/ Soft copy) for Classroom & Online (Moodle ULT) Video projection
Reading list	Document and references are given by supervisors depending on each project