Course Code	Course Title	Credits	Prerequisite
DTE511	Fundamentals of Digital Transformation	٤	-
Course Description	**1. Objectives:** Upon completion of the course, a student will be able to: • Understand Core IT technologies and importance of Digital Transformation. • Learn about the elements and examples of digital disruption. • Explore the transformative potential of disruptive technologies such as Artificial Intelligence, the Internet of Things, Big Data, and many more. • Develop a digital business model and refine it in stages. • Develop an innovative customer-centric product or service that can be at the center of your business model. **2. Content:** This course covers the following main topics: Deep-dive into Digital Disruption; Disruptive Technologies & Their Transformation Potential; Developing a Digital Business Model. **3. Assessment Method** • Assignments and exercises • Quizzes • Project and Seminars • Midterm Exam • Final Exam.		

Course Code	Course Title	Credits	Prerequisite
DTE512	Cloud Computing and Business	٤	-
Course Description	**1. Objectives:** Upon completion of the course, a student will be able to: • Explain the core concepts of the cloud computing paradigm. • Distinguish the types of cloud models by service layers and deployment types. • Describe the needs, usage, importance, and impact of cloud systems in various disciplines.		

- Identify organizational skills gaps and design business solutions leveraging cloud innovation.
- Implement a governance model to manage cost, security, and compliance at an enterprise scale.

2. Content:

This course will provide a comprehensive introduction to cloud computing and will focus on the unique knowledge and skills that students need to unlock the value of cloud technologies for various business organizations. Also, the students will learn the major migration strategies that allow a business at any stage of technology to adopt the cloud and will learn how to maximize business value while minimizing risks to their organization by defining an organization-wide governance model. In particular, the course will enable the students to dive deep into risk areas such as security, compliance, and cost to understand the mechanisms provided by cloud providers and help them build a governance model on top to manage the risks.

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam
- Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE513	Cybersecurity and IT Risk Management	٤	

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Develop security strategies that are consistent with the goals and objectives of an organization.
- Employ risk assessment techniques in real scenarios
- Implement a robust cybersecurity education, training, and awareness programs.
- Use quantitative risk measurement techniques when discussing networks and projects
- Use qualitative risk measurement techniques when discussing networks and projects
- Discuss current events in the technology space in relation to risk management decision

2. Content:

In this course, you will learn the terms used by executives and managers in discussing Risk Management, and how to apply the concepts of Risk Management to your networks, systems, and projects. This course focuses on the mindset of managers and teaches you how to think like they do. Once you master these concepts, it is much easier to build your business case for your projects and justify your budgetary needs. Throughout this course, we will discuss what comprises Risk (assets, threats, and vulnerabilities), providing numerous real-world examples along the way. We will also cover Qualitative and Quantitative Risk Measurements, showing how you can calculate the risk of an uncertainty due to vulnerabilities and threats.

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam
- Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE521	Data Analytics and Artificial Intelligence	٤	-

Course Description	**1. Objectives:** Upon completion of the course, a student will be able to: • Discover a wide variety of concepts relevant to data analysts, such as the data analysis process. • Discover necessary knowledge and practical understanding of the main statistical techniques. • Use data analytics and AI for practical tasks • Define the principles of data analytics and AI and its history • Implement common AI applications including image recognition, sentiment analysis, and product recommendations. **2. Content:** Ways to describe data with simple parameters, analysis of training data and test, standard deviation, correlation, data analysis process. Introduction to AI, The history of AI, Concept of Agent, Types of Learning, Searching algorithm and Problem Solving, Heuristic Search, foundation of machine learning, data classification. **3. Assessment Method** • Assignments and exercises • Quizzes • Project and Seminars • Midterm Exam • Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE522	Internet of Things Technologies	٤	-

Course Description	**1. Objectives:** Upon completion of the course, a student will be able to: • Recognize the reference framework of IoT and its main components. • Identify different IoT sensors and actuators needed for different IoT solutions. • Evaluate different IoT communication protocols. • Compare between the threats in IoT and traditional ad hoc networks.

	• Illustrate the security and privacy challenges and solutions in IoT. • Apply different mechanisms to manage large data files collected from sensors. • Implement IoT prototypes and test them as running applications. **2. Content:** **Introduction to the Internet of Things (IoT):** define IoT, its main components and how it works from a technical standpoint. **IoT sensors and devices:** identify sensors, microcontrollers and actuators needed for different IoT solutions, and recall basic electronic design to map an IoT system incorporating these devices. **IoT networks and protocols:** evaluate different infrastructure components and network systems, analyses protocols and determine best fit for different IoT applications. **IoT security and privacy issues:** Illustrate the security challenges and solutions in IoT. **IoT programming and big data:** apply software to manage large data files collected from sensors and interact with the real world via actuators and other output devices. IoT implementation: students will be given an opportunity to apply IoT technologies to conduct study cases of their choice in teams, using an experimental platform for implementing prototypes and testing them as running applications. All project teams will present their completed projects. **3. Assessment Method** • Assignments and exercises • Quizzes • Project and Seminars • Midterm Exam • Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE523	Blockchain Fundamentals	٤	-
Course Description	**1. Objectives:** Upon completion of the course, a student will be able to: • Define concepts, the features and the limitations of Blockchain technology • Explain the differences between Blockchain and other technology systems • Describe cryptographic concepts that are related to Blockchain technology		

	• Analysis and evaluate the risk of using Blockchain • Understand current attacks on Blockchain at sufficient depth to determine the possible attack in the future • Discuss how Blockchain can be applied for different frameworks such as legal, political, medical and societal • Create a simple Blockchain application **2. Content:** This course covers the following main topics: • Blockchain technology overview (definitions, limitations, opportunities and challenges of Blockchain) • Public & private Blockchain • Cryptography, hashing and transaction • Mining and consensus • Centralized and decentralized • Smart contacts • Wallet, transactions, public and private keys • Security, integrity and privacy issues of Blockchain • Blockchain applications **3. Assessment Method** • Assignments and exercises • Quizzes • Project and Seminars • Midterm Exam • Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE531	Business Decision Analytics	٤	-
Course Description	**1. Objectives:** Upon completion of the course, a student will be able to: • Understand of how managers use business analytics to elicit and resolve business issues and support managerial decision-making. • Employ several optimization tools, and technologies for evaluating, leveraging, and sharing business data to benefit enterprise workers to make informed decisions. • Analyze, visualize and report the business data using several techniques for solving business real-world problems.		

- Employ data management science and business analytics in decision-making related to business and industrial processes.
- Utilize advanced business analytics tools/software in data-driven decision-making.

2. Content:

This course covers the use of the concepts and methods such as quantitative and statistical techniques to analyze business problems that require decision-making. In fact, it covers an understanding of how managers can use several business analytics to elicit and solve business issues and support managerial decision-making in a coherent manner using various optimization tools and techniques for business problem-solving. Since business problems often have too many alternative solutions, you will learn how optimization tools can help you identify the best option. Also, this course explores Business Decision Analytics as a wide-ranging category of concepts, tools, and technologies currently used in managerial decision-making processes to solve real-world business problems, such as method/duality, decision tree analysis, linear/dynamic programming, multi-criteria decision-making, network optimization models, simulation, data mining, data visualization, and decision theory.

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam
- Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE532	Human Centred Design	٤	-

Course Description	**1. Objectives:** Upon completion of the course, a student will be able to: • Understand the core concepts of human centered design. • Describe the needs, usage, importance, and impact of human centered design in various disciplines. • Learn the human centered design methodology as well as gain tools and techniques to implement it. • Recognize the phases and principles of human centered design • Learn how to build and develop better solutions with the end user in mind. **2. Content:** This course provides a framework for innovation and design process to develop solutions that match up with what the end user needs. It explains how to move forward and respond to changing customer ideas, expectations, needs, and wants. It gives details about the phases of human centered design (i.e., inspiration, ideation, and implementation). Also the course will provide the critical principles in order to successfully implement a human-centered design approach (i.e., focusing on the people, finding the right problem, thinking of everything as a system, and testing everything). **3. Assessment Method** • Assignments and exercises • Quizzes • Project and Seminars • Midterm Exam • Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE533	Big Data Analytics	3	-

Course Description	**1. Objectives:** Upon completion of the course, a student will be able to: • Demonstrate a critical understanding of concepts and activities for Big Data Analytics • Reframe a business challenge as an analytics challenge • Explain how advanced analytics can be leveraged to create a competitive advantage from the available big stores of business data • Apply appropriate advanced analytic techniques and tools to analyze big data, create statistical models, and identify insights that can lead to actionable results • Select appropriate data visualizations to clearly communicate analytic insights to business sponsors and analytic audiences **2. Content:** This course will aim to educate the students about how to apply the growing body of machine learning (ML) algorithms to various Big Data sources in a business context. By the end of this course, students will have a better understanding of processes, methodologies, and tools used to transform a large amount of business data available into useful information and support business decision-making by applying ML algorithms. The focus of the course is less on the technical aspects of ML algorithms and more on the application of ML algorithms to Big Data available in different domains. The course will use recent technologies such as python as the primary data analysis platform for the execution and deployment of ML projects. **3. Assessment Method** • Assignments and exercises • Quizzes • Project and Seminars • Midterm Exam • Final Exam.

Course Code	Course Title	Credits	Prerequisite

DTE551	Research and Innovation	4	-

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Review and critique digital emerging technologies research literature, research design and reported findings.
- Define ethical and professional issues that may arise in the field of digital research and innovation.
- Recognize the technical, professional and socio-economic contexts that motivate research, and the implicates research outcomes;
- Recognize the main general research methodologies of digital research.
- Define most common data collection and analysis methods used in emerging technologies and digital transformation.
- Acquire the necessary skills to select and justify an appropriate research methodology for tackling a specified problem.
- Acquire the communication and presentation skills to represent research findings and presentation of innovative idea, both orally and in writing, in research settings.

2. Content:

This course enables students to conduct and to communicate their own research and innovation, as well as to be knowledgeable consumers of others' research and innovation in the field of digital transformations. It introduces students to the basic concepts, methods, problems, tools, and techniques associated with research and innovation in general but focuses on those most commonly used for research and innovation in digital transformations and emerging technologies. It introduces students to research ethics and professional practice, problem statement and hypothesis formulation, the principles of research design, research methods and techniques of data acquisition and analysis appropriate to new emerging technologies. Course focuses on user-centric innovation and change management within new and existing systems. It also covers oral and written research and innovation presentation and communication skills.

3. Assessment Method

- Assignments and exercises
- Quizzes

	• Project and Seminars • Midterm Exam • Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE561	Research Project	4	-

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Demonstrate that he has acquired specialization and skills in a particular part of data transformation and emerging technologies field.
- Formulate a moderate sized problem and select and justify an approach to solve the problem within certain constraints.
- Watch ethical principles throughout the work.
- Prepare a written report on the work done
- Make an oral presentation that should accurately summarize the work done.

2. Content:

In this course, the student will use the skills and knowledge gained during his studies to demonstrate the ability to design a data transformation and emerging technologies project from the design stage to the implementation and verification stage. This is done under the supervision of a faculty member in the department.

3. Assessment Method

- Project presentation and discussion in front of a Committee
- Evaluation of the project report

Course Code	Course Title	Credits	Prerequisite
DTE540	Social Enterprise Design	4	-

Course Description	**1. Objectives:** Upon completion of the course, a student will be able to: • Understand social enterprise business models and designing principles. • Link strategies to organizational performance, competitiveness, and innovation. • Analyze social impact assessments and evaluate how to enhance stakeholder experience. • Dealing with organizational and measuring its impact over organizational ecosystem. • Creating efficient and effective organization via enabling social enterprise. • Knowledge of measuring and reporting impact of social enterprise. **2. Content:** The aim of this course is to guide students through various stages of social enterprise necessary to design an enterprise from abstract and conceptual notions through the design for a proposed venture. Major components of this course are: framework for strategic decisions based on social norms, value creation and business model design, corporate social responsibilities, understanding competitive business landscapes, entrepreneurial drives, and confronting paradoxes in the social enterprise design. Students will also learn about social impact assessments, communication strategies for developing social enterprises, providing competitive edge to beneficiaries and stakeholders, organizational growth and change, and managing internal and external strategic relationships. **3. Assessment Method** • Assignments and exercises • Quizzes • Project and Seminars • Midterm Exam

	• Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE541	Work Integrated Learning	4	-

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Define the scope of work integrated learning in various environments
- Understand key ideas of work integrated learning, e.g., professional, employability and soft skills, tacit knowledge, and conscious knowledge and reflection
- Understand work integrated learning complexities and challenges in workplaces
- Develop strategies and approaches to work integrated learning
- Practice work integrated learning case studies focusing on various environments
- Practice work integrated learning strategies for students, staff, industries, and institutions

2. Content:

The aim of this course is to enable students to immediately apply their learned knowledge into the real world of work to have hands-on experience over industrial standards and practices. The integrated learning enables to improve career prospects, enhance student employability, scale up or cope with professional growth, to improve outcomes and practices, to socialize potential future talents, and to know how effectively be part of the system that best suits the professional context. This course will provide basics of work integrated learning and complexities, resources and templates, information on how to make informed decisions, involvement of industries in work integrated learning, and know how to discover a growing strategy in career development.

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam
- Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE542	Design Thinking and Creative Intelligence	4	-

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Understand the ideas behind design thinking methodologies.
- Form design thinking teams and hold design thinking workshops.
- To address challenges, use both critical thinking and design thinking simultaneously.
- Incorporate some design thinking principles into your regular job.
- Improve your results by using data design.
- Resolve issues and enhance management approach.
- Create products and services that are centered on the consumer.
- Anticipate and react to emerging trends and technology.
- Product, service, process, business model, and strategy development
- Make critical decisions early in the development process to save resources later in the process.

2. Content:

The course should cover the following main topics: Origins of design thinking and design thinking skills; Principles of Design Thinking; Design thinking frameworks and techniques**;** general design thinking practices; Writing a design brief; Competitor analysis; Creative leadership, vision and values; Brainstorming and ideation; Audience/customer profiling; Customer journeys & empathy experiments; Synthesis and insights; Visualization methodologies; Prototyping & iteration; Design metrics, evaluation, validation and testing.

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam

	• Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE543	User Experience Design	4	-

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Empathize with users, establish pain areas, brainstorm solutions, build wireframes and prototypes, test and iterate on ideas.
- Understand the fundamentals of user experience research, such as how to organize research studies, conduct interviews and usability testing, and synthesize research findings.
- Use fundamental user experience principles such as user-centered design, accessibility, and equity-focused design.
- Create a professional user experience portfolio with three complete projects: a mobile app, a responsive website, and a cross-platform experience.

2. Content:

The course should cover the following main topics:

- User Experience History and Background
- Elements of User Experience Design
- Heuristic Evolution
- User Research
- User Experience Design Process
- User Experience Delivery Process
- User Experience Projects

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam
- Final Exam.

<table>
<tr><th>Course Code</th><th>Course Title</th><th>Credits</th><th>Prerequisite</th></tr>
<tr><td>DTE544</td><td>Big Data Theory and Practice</td><td>4</td><td>-</td></tr>
<tr><td>Course Description</td><td colspan="3">
1. Objectives:

Upon completion of the course, a student will be able to:

Demonstrate a comprehensive understanding of the essential principles, practices, and technologies employed in the effective design and development of systems capable of collecting, storing, and managing Big Data;
Describe the needs, usage, importance, and impact of big data in various disciplines
Explore business problems and create scalable solutions using Big Data resources
Recognize challenges faced by business applications dealing with large volumes of data
Demonstrate knowledge to adapt emerging big data such as MapReduce and NoSQL, to support business applications

2. Content:

This course starts giving the theory of big data systems with an aim to educate the students with foundation knowledge of Big Data. Also, the course provides an overview of the global trend of big data and how big data can be used to solve problems in various disciplines. On the practical side, the students will gain hands-on experience in collecting, storing, and managing a large volume of data. Then, they will learn to implement big data systems and their values in various disciplines through case studies. Also, the course will enable the student to recognize and solve the challenges of high-dimensional data.

3. Assessment Method

Assignments and exercises
Quizzes
Project and Seminars
Midterm Exam
Final Exam.

</td></tr>
</table>

Course Code	Course Title	Credits	Prerequisite
DTE545	Robotics and Automation	4	-

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Recognize the basic principles, software and hardware architectures of smart robotic systems.
- Describe the essential issues of analysis, design and control of intelligent robotic systems.
- Perform Programming and implementation of smart algorithms.
- Define the difference between the conventional robot and AI robot.
- Design and develop an Intelligent Robotic Systems.

2. Content:

This course covers: the design and development of robotic systems. Emphasis is on the multidisciplinary nature of robotic systems, including system design, feedback control systems, vision-based control, and autonomy. Participants will obtain detailed knowledge of the techniques needed to develop intelligent robots. Major topic areas include manipulator kinematics and dynamics, closed-loop control for robotic systems, mobile robots, vision techniques for robotics, building robotic systems, intelligent control, object recognition and supervised learning. The course highlights the fundamental difference between what we will call an AI robot and a more normal robot

	3. Assessment Method • Assignments and exercises • Quizzes • Project and Seminars • Midterm Exam • Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE546	Agile Mindset Methodology	4	-

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Understand the need for an agile system (including the Scrum framework), and perceive its benefits.
- Learn the dimensions of agile transformation, and see how agile differs from lean
- Gauge where one's organization stands on an agile barometer, and enable it for an agile transformation.
- Create an agile playbook for reference and to educate new adopters.
- Build and nurture scalable, agile processes and teams.
- Organize Scrum events for a Scrum team and introduce an Agile or Scrum approach to an organization.

2. Content:

The course covers the following main topics:

- Introduction to Agile
- Blueprint of Agile Transformation
- Roadmap of Agile Transformation
- Agile Culture & Leadership
- Describe the five important Scrum events and how to set up each event for a Scrum team

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam
- Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE547	Cybersecurity threats and countermeasures	4	-

Course Description

1. Objectives:

Upon completion of this course, a student will be able to:

- Recognize the fundamental cybersecurity principles.
- Define the practical security issues arising in a wide range of domains;
- Understand how to use existing techniques and tools to minimize security risks for the enterprise or organization;
- Acquire experience in discussing and writing about security related issues.

2. Content:

The course covers security issues and current best practices in several applicative domains, ranging from the enterprise to the military. The course discusses emerging security threats and available countermeasures with respect to the most recent network and computing technologies, including wireless networks, computer-controlled physical systems, and social networks. The course concludes presenting current trends and open problems.

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam
- Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE548	Selected Topics in Digital Transformation	4	-

Course Description	**1. Objectives:** Upon completion of the course, a student will be able to: • learn about the state of the art topics that arise in the Digital Transformation field **2. Content:** In this course, a topic or a set of topics that will be determined and approved by the program committee to reflect the most recent issues in the field of Digital Transformation that might appear after approval of the study plan. **3. Assessment Method** • Assignments and exercises • Quizzes • Project and Seminars • Midterm Exam • Final Exam.

<table>
<tr><th>Course Code</th><th>Course Title</th><th>Credits</th><th>Prerequisite</th></tr>
<tr><td>DTE549</td><td>Selected Topics in Emerging Technologies</td><td>4</td><td>-</td></tr>
<tr><td>Course Description</td><td colspan="3">1. Objectives:

Upon completion of the course, a student will be able to:

• learn about the state of the art topics that arise in the Emerging Technologies field

2. Content:

In this course, a topic or a set of topics that will be determined and approved by the program committee to reflect the most recent issues in the field of Emerging Technologies that might appear after approval of the study plan.

3. Assessment Method

• Assignments and exercises
• Quizzes
• Project and Seminars
• Midterm Exam
• Final Exam.</td></tr>
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Course Code	Course Title	Credits	Prerequisite
DTE550	Administrative Leadership	4	-

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Recognize foundations, theories and development of leadership.
- Study of the role of administrative leadership in achieving the organization's goals.
- Acquire the required skills to develop the administrative leader.
- Analysis of the current status of administrative leaders and the problems that intercept them in the public sector
- Learn about models and mechanisms used to achieve the government leadership.

2. Content:

The course deals with the foundations, theories and development of leadership, the study of prevailing leadership techniques and styles, the study of the role of administrative leadership in achieving the organization's goals, the importance of leadership in the organization and the differences between the leader and the manager, the compulsory skills to develop the administrative leader to carry out his role to the fullest, and an analysis of the current status of administrative leaders and the problems that intercept them in the public sector. The concept of government leadership, its models and mechanisms for achieving it.

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam
- Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE551	Managerial Decision Making	4	-

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Recognize how to apply prescriptive analytics such as optimization models and decision analysis in management.
- Use decision models in different applications including data management applications.
- Use software tools to apply decision making concepts.

2. Content:

This course deals with prescriptive analytics including: optimization models, decision analysis, and their applications in management sciences. The course focuses on deterministic and probabilistic decision models. Areas of application include, data management, digital transformation management, corporate planning, finance, marketing, production and operations management, distribution, and project management. Concepts are applied through team projects and tutorials using computer software.

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam
- Final Exam.

Course Code	Course Title	Credits	Prerequisite
DTE552	Crisis and Risk Management	4	-

Course Description

1. Objectives:

Upon completion of the course, a student will be able to:

- Recognize the most important scientific theories related to risk prediction and crisis response.
- Learn about many case studies related to risks and crises.
- Acquire the necessary skills to manage the risks and crises in the organization.

2. Content:

The course includes an introduction to risks and crises. In addition, the course reviews the most important scientific theories related to risk prediction and crisis response. During the study of the course, many case studies related to risks and crises and how to manage them will be addressed.

3. Assessment Method

- Assignments and exercises
- Quizzes
- Project and Seminars
- Midterm Exam
- Final Exam.

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