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| **Course Code** | CS111 | Credit Hours | **4** |
| **Course Title** | Introduction to Emerging Technologies | | |
| **Programme** | BSc. In Computer Science / BSc. in Software Engineering | | |
| **Course Description** | The Introduction to Emerging Technologies course will expose students to the topics and current state-of-the-art in a small set of broad emerging technologies topics. The course will focus on high-demand applications of CS knowledge and theory. Specifically, this will be an exposure to the myths and realities of several (often misunderstood) emerging technologies (e.g., IoT, cloud computing, artificial intelligence). | | |
| **Objectives** | By the end of this course the student will be able to:   * Identify different emerging technologies * Differentiate between a couple of emerging technologies * Select appropriate technology and tools for a given task * Identify necessary inputs for application of emerging technologies   In this course, we will discuss the emergence of new technologies leading to entrepreneurial opportunities. This involves identifying high-potential, technology-intensive commercial opportunities, reviewing what is relevant and currently discussed in the academia. We also discuss disruptive innovations and their effects on organizations and societies.  The course will focus on concepts and the current state-of-the-art of technologies and shall include the following:   * Cloud Computing * Edge Computing; Mobile and Internet of Things * Machine Learning/Artificial Intelligence * Blockchain * Big Data and Data Management * Cyber Security * Quantum Computing | | |
| **Textbook** |  | | |
| **References** | * Introduction to Emerging Technologies Course Module (MoSHE) * Online resources | | |
| **Assessment Method** | |  |  | | --- | --- | | * Assignments: 20% | * Mid. Exam: 20% | | * Class activities & participation 10% | * Final Exam: 50% | | | |
| **Term - Year** | * Winter 2021 | | |
| **Instructor** | Abdella E. Mohammed [abedris@yahoo.com](mailto:abedris@yahoo.com) www.github.com/abedris | | |

**COURSE CONTENT**

1. Introduction
   1. Evolution of Technologies
   2. Role of Data for Emerging Technologies
   3. Enabling devices and networks (Programmable devices)
   4. Human-Machine Interaction
   5. Future Trends in Emerging Technologies
2. Data Science
   1. An overview of data science
   2. Data types and data representations
   3. Data value Chain
   4. Basic concepts of big data
3. Artificial Intelligence (AI)
   1. What is Artificial Intelligence?
   2. History of AI
   3. Levels of AI
   4. Types of AI
   5. Influencers of artificial intelligence
   6. Applications of AI
   7. AI tools and platforms
   8. Sample AI application
4. Internet of Things (IoT)
   1. Overview of IoT
   2. How does it work?
   3. IoT Tools and Platforms
      1. IoT Based Smart Home
      2. IoT Based Smart City
      3. IoT Based Smart Farming
5. Augmented Reality (AR)
   1. Overview of augmented reality
   2. Virtual reality (VR), Augmented Reality (AR) vs Mixed reality (MR)
   3. The architecture of AR Systems
   4. Applications of AR Systems
6. Ethics and Professionalism Of Emerging Technologies
   1. Technology and ethics
   2. Digital privacy
   3. Accountability and trust
   4. Treats and challenges
7. Other emerging technologies
   1. Nanotechnology
   2. Biotechnology
   3. Blockchain technology
   4. Cloud and quantum computing
   5. Autonomic computing (AC)
   6. Computer vision
   7. Embedded systems
   8. Cyber Security
   9. Additive manufacturing (3D Printing)