Dr Description of Courses offered by the Department of Computer Science\Computer Multimedia Systems 2019/2020.

11021101 General Physics (1) (Prerequisite: - none) (3) Cr. Hrs

Vectors, Basics of Mechanics Description of Motion in one Dimension, Motion in two Dimensions, Applications of Newton's Laws, Work Energy Theorem, Collisions and Rotational Motion

11031101 Calculus (1) (Prerequisite:- none) (3) Cr. Hrs

Functions and Limits, Continuous functions, derivative, differentiation rules, implicit differentiation, applications integrals, definite integrals, transcendental functions, inverse trigonometric functions.

06051110 Programming Methodology (Prerequisite: - none) (3) Cr. Hrs

Problem-solving concepts: constants and variables, data types, problem-solving steps, expressions, problem solving tools, algorithms, flowcharts, pseudo-code, programming logic structures (sequential, decision, and loops), Arrays.

06051200 Discrete Mathematics (Prerequisite: - none) (3) Cr. Hrs

Introduction to discrete structures and techniques for computing. Sets, graphs and trees. Functions, relation properties, recursive definitions, solving recurrences, equivalence, partial order. Proof techniques, inductive proof counting techniques and discrete probability

06051220 Logic Design (Prerequisite: - 11021101**) (3) Cr. Hrs**

Fundamental concepts of Numbering systems, computer codes. Boolean algebra and logic gates. Simplification of Boolean functions, Karnaugh map, combinational logic implementation including PLAs, (adders, comparators, coders, decoders, code converters, multiplexers, de-multiplexers). Sequential circuits, flip flops, counters, shift registers, memories

06051211 Programming Fundamentals (Prerequisite: - 06051110**) (3) Cr. Hrs**

Fundamental concepts of programming using C++ or Java: classes and objects, modeling object (attributes and behaviors), algorithms, problem solving flowcharts, pseudo codes. Basic blocks of programming such as variable names, data types, control structures, functions, arrays.

06032102 Data Structures (Prerequisite: - 06051211**) (3) Cr. Hrs**

Problem solving, Data Structures (static & dynamic), lists, stacks, queues, graphs, trees, sets and dictionaries). Recursion and iteration. Students are expected to do lab experiments using C# or Java.

06012232 Information Systems Analysis & Design (Prerequisite:-06032112**) (3) Cr. Hrs**

System Theory, information systems and information systems types, system analysis and design methods, object oriented system analysis and design methods. Study cases.

06032112 **Object Oriented Paradigm** **(Prerequisite: -** 06051211**)** **(3) Cr. Hrs**

Introduction to OOP, models, objects, methods, links, message passing, polymorphism, dynamic binding, classes constructors and destructors, association, generalization and specialization, inheritance, overridden methods, aggregation. Students are required to perform some lab experiments using the latest JAVA or C# language version and UML using Rational Rose software.

06012201 **Algorithmic** **(Prerequisite: -** 06032102**)** **(3) Cr. Hrs**

Introduction to the design and analysis of algorithms, mathematical algorithms. Greedy technique, manipulating data: sorting, searching, dynamic programming, space & time tradeoffs. The concept of algorithm efficiency, table, and information retrieval. Combinatorial problems, advancement in Java skills and techniques

06032122 **Computer Architecture** **(Prerequisite: -**06051220**)** **(3) Cr. Hrs**

Hardware components of a modern computer system, history and performance, the instruction cycle, memory organization, cache memory, I/O organization, CPU, micro-programmed control, instruction formats and modes

06033113 **Visual Programming** **(Prerequisite: -** 06032112**)** **(3) Cr. Hrs**

Basic Visual Programming, solid foundation of the syntax and semantics of a visual Programming language used to develop both windows-based and web-based application. Coverage of Microsoft's. NET platform architecture.

06013214 **Web Design (1)** **(Prerequisite: -** 06032112**)** **(3) Cr. Hrs**

Basic concepts of the Internet and Internet browsers, Internet applications, web page creation tools and languages. Basic XHTML (frames, forms), cascading style sheets, scripting and scripting languages. Dynamic XHTML (object based programming and events). Students are required to do a Mini- project.

06014115 **Web Design (2)** **(Prerequisite: -**06013214**)** **(3) Cr. Hrs**

This unit introduces students to design, development and implementation of server side applications, the use of multimedia and human interaction on the browser side. Students gain practical experience creating dynamic web applications that interact with a database using client side scripts, server side scripts and compiled server programs. Security, access right, financial transactions and legal issues are also covered. This unit incorporates substantial practical experience in applying theoretical concepts. Students are required to submit mini project.

06013130 Databases (Prerequisite: - 06012201**) (3) Cr. Hrs**

An in-depth examination of relational databases, modern database technologies, conceptual design and entity relationship modeling, relational algebra and calculus, data definition and manipulation languages using SQL, schema and view management, query processing and optimization, transaction management, security, privacy, integrity, and management. Students are required to do project work.

06083223 Operating System (Prerequisite: - 06032122**) (3) Cr. Hrs**

Definition of operating system, review of hardware, software and firmware, process concepts, asynchronous concurrent processes, real storage, virtual storage, processor scheduling, distributed computing, disk performance optimization.

06052221 Computer Organization and Design (Prerequisite: - 06032122**) (3) Cr. Hrs**

Explores the levels of architecture and organization in digital computers: logic circuit design, integrated circuits and assembly language coding.

06022173 Multimedia Systems (Prerequisite: - None**) (3) Cr. Hrs**

Introduction to the study and creation of multimedia, using various software programs. Students will learn both the aesthetic and technical aspects of multimedia design and production. Students will be introduced to Web production and the business process behind multimedia, working in teams to produce a Web-based product for real business clients. Students will use software programs such as Macromedia Dreamweaver, Flash, Director, and Adobe Photoshop.

06022251 Multimedia Production (Prerequisite: - 06022173**) (3) Cr. Hrs**

This course is concerned with assembling, adjusting and operates various audio and video components, including cameras, microphones, lights and sound mixers. Fundamentals of video shooting, sound, lighting, and editing, among other production issues will be covered. Students will know how to compose text, images, graphics, charts, audio, and videos to produce a short film.

06022252 2-D Graphics Animation (Prerequisite: - 06022157**) (3) Cr. Hrs**

Creation of animation and dynamic interactive media for web and multimedia applications. Students will learn how to animate objects, create symbols, and assemble motion teens. However this course focuses on the animation objects of 2-D images.

06024153 Virtual Vision (Prerequisite: - 06023158**) (3) Cr. Hrs**

Introduce the students to the new concepts, techniques and applications of virtual reality in multimedia and engineering. The major areas of study include an overview of virtual reality systems, both hardware and software, and computer graphics techniques used to simulate virtual environments. Problems relating to interacting with the virtual world, including depth perception, the selection of objects, and the movement of objects are studied. Also problems relating to the interaction and collision of objects within the environment are studied.

06023254 Visualization of Data (Prerequisite: - 06033113**) (3) Cr. Hrs**

Define data visualization, and how to re-represent data in clear graphics. Design and create data scenarios using available and important data to be achieved. Explain data modeling and processing (eg aggregation and filtering), visual coding and data mapping of graphic features. How to evaluate the effectiveness of perception scenarios and criticism of design decisions (color selection and visual coding) will be illustrated. Practical part: Use data visualization tools (can be D3.js) to solve problems.

06033274 Human Computer Interaction (Prerequisite: - 06033113**) (3) Cr. Hrs**

Tools and techniques for designing, implementation, deploying and evaluation of user interfaces. Interactive systems; dialogue styles, theories of interaction and component integration, human-computer interaction frameworks.

06023256 3-D Graphics Animation (Prerequisite: - 06022252**) (3) Cr. Hrs**

Basic concepts of 3D modeling and animation using special software for the production of three-dimensional computer animations and the different approaches to modeling in a 3D environment. Familiarization with both the interface and the production process of 3D animation. Texture mapping, lighting and rendering of simple animations and environments.

06022157 Computer Graphics (Prerequisite: - 06051211**) (3) Cr. Hrs**

Introduction and basic fundamentals of computer graphics. Lines and circles algorithms. Geometrical transformation in two - dimensions and three - dimensions (Translation, Scaling, Rotation).Composing transformations, projection, methods for forming two- dimensional views using curves. Students are required to do lab Assignments.

06024290 Practical Training for CMS (Prerequisite: - Pass 90 Cr.hr.**) (3) Cr. Hrs**

Practical training in the public or private sector for at least 8 weeks

06024191 Graduation Project -Multimedia (Prerequisite:-Pass 90 Cr.hr.**) (3) Cr. Hrs**

Student picks one of the projects posted by the department as part of requirements of graduation.

06013256 Smart Phone Programming (Prerequisite: - 06033113) (3) Cr. Hrs

The smart phone programming course allows students to learn the fundamentals of programming for smart phones. It covers various concepts related to layouts, widgets event handling, processing JSON files, using MySQL database with php service. The course allows students to be familiar with a mainstream of today's technology

06023158 Multimedia Programming (Prerequisite: - 06022252**) (3) Cr. Hrs**

The main objective of this course is to introduce the student to the basic programming tools of Multimedia systems. This course provides students with a comprehensive study of the C++ Programming Language which is the basic block for all multimedia programming. The course stresses the object paradigm including classes, inheritance, virtual functions, and templates in the development of C++ programs. Lab exercises reinforce the lectures.

06023259 Image Processing (Prerequisite: - 06032112**) (3) Cr. Hrs**

This is an introductory course to the fundamentals of digital image processing. It emphasizes general principles of image processing, rather than specific applications. The student will cover topics such as image acquisition and display, properties of the human visual system, color representations, sampling and quantization, point operations, linear image filtering and correlation, transforms and sub-band decompositions, and nonlinear filtering, image compression using various methods.

06024160 Games Systems (Prerequisite: - 06023256**) (3) Cr. Hrs**

Provide the students with knowledge of the game industry and also the experience in playing games and creating their own games. The Definition of a "Game", the Psychological Influence in Game Playing, The Difference between Good Games and Bad Games, Defining Good Game-play, Playability and Replay Value, Emotional Effects in Playing Games, Determining the Quality of a Game.

11031230 Statistics and Probabilities (Prerequisite: - 11031101**) (3) Cr. Hrs**

Definitions and basic elements of probability, Rules of probability, Random Variables: Discrete and continuous random variables and their probability distribution functions, the mathematical expectation. Some discrete and continues distributions: Binomal, Poisson, geometric, Hyper geometric and Normal Distributions. Point and interval estimation of the parameters of one and two populations. Tests of hypotheses concerning the above parameters, and Goodness of fit and independence tests. Simple linear Regression and inference concerning its parameters multiple linear regression: Description and estimate using matrices.

06052253 Numeric Analysis (Prerequisite: - 11031101**) (3) Cr. Hrs**

The error calculation, roots of nonlinear equations, use of numerical methods to solve systems of linear equations, approximation Functions, Find derivatives, find the values of numerical integrals by numerical methods, the use of numerical methods to solve differential equations

06042150 Information Security (Prerequisite: - 11031230**) (3) Cr. Hrs**

Information security basics, basic cryptography, modern symmetric ciphers, public key cryptosystems, key management, message authentication, hash functions, digital signatures, IP and web security, firewalls and trusted systems, secured software design, application security software threats, social, legal, and ethical issues. Human factors in security.

06013231 Database Management Systems (Prerequisite: - 06013130**) (3) Cr. Hrs**

Application development, integrated application, XML standards distributed database processing and view support. Data protection problems, recovery, concurrency, security and data integrity. Database administration and tuning, all practical applications shall be implemented in ORACLE.

06014254 Information Retrieval Systems (Prerequisite: - 06013130**) (3) Cr. Hrs**

Consideration of the basic principles and tools for analysis and retrieval of information in various information systems (textual and Database systems). Topics include differences between data retrieval and information retrieval, retrieval concepts, types of retrieval systems, web search architectural, tokenization, and query operations.

06023173 E-Learning Systems (Prerequisite: - 06022173**) (3) Cr. Hrs**

Fundamentals and techniques of e-Learning systems, e-learning theoretical background, models of e-learning modules , theories of learning convenient to e-learning modules, e-learning methodology, tutorial , drill & practice , problem solving , e-exam , dialog, instructional simulation, instructional computer games, intelligent learning, e-learning strategies, Authoring e-learning systems, e-learning for handicapped students, Criteria of evaluating e-learning systems and instructional websites design.

06023274 Digital and Audio Effects (Prerequisite: - 06022251**) (3) Cr. Hrs**

Techniques for the creation of special effects of visual and audio objects on 2D and 3D graphics through digital compositing for film and video. Merging original 2D images such as photographs or other still images generated in Photoshop or Corel Painter with 3D models created in Alias' Maya program. Different output formats and uses for these compositing techniques in diverse industries.

06013176 Artificial intelligence (Prerequisite: -06012201**) (3) Cr. Hrs**

Introduction to artificial Intelligence, symbolic reasoning and knowledge representation techniques, control strategies, heuristic search, and AI applications (expert systems, neural language processing, robotics…etc.). Introduction to neural networks, genetic algorithm and machine learning.

06082140 Computer Networks (Prerequisite: - 06051220**) (3) Cr. Hrs**

Logical and physical of computer networks, architecture and transmission alternatives. OSI-reference model, ALOHA protocol, CSMA protocols, LAN, IEEE standards and protocols (token ring, token bus and Ethernet), physical layer basics, data link layer, framing protocols, error detecting and correcting, routing algorithms, flow control, congestion control algorithms, personal computer networks.

06024277 Multimedia in Advertisement (Prerequisite: - 06022173**) (3) Cr. Hrs**

Provides the students with technical and practical skills in developing digital advertisements via website and digital media using multimedia objects and effects (Text, audio, visual, images, and animation). Objective To expose students the skills of applications and the techniques in the art of advertisement. Topics to be covered include: Text and audio, image and video, the art of multimedia, multimedia over the network, advertisement in website.

06014171 Special Topics (1) (Prerequisite: - Dept. Approval**) (3) Cr. Hrs**

To be set by the department.

06014272 Special Topics (2) (Prerequisite: - Dept. Approval **) (3) Cr. Hrs**

To be set by the department.