

Computer Science Course Description

Course Code and Title: MATH 3/MATH 1103 Pre-Calculus

Basic principles of algebra including the number line and an introduction to equations and inequalities, polynomials, rational expressions, exponents and radicals, the quadratic formula, and functions. **Prerequisite:** GFP 302

Course Code and Title: Psych 1101 / Psych 50 Introduction to Psychology

Designed to assist the individual in developing a growing understanding of basic psychological concepts, an increased awareness of oneself, a continuous interest in human behavior, and an increased effectiveness in relating to other people.

Course Code and Title: SPMS1185 / SPMS85 Introduction to Speech

This course provides the students with an opportunity to study the components of a good presentation. It gradually guides candidates to prepare and introduce effective presentations. It also aims at increasing self-confidence through controlling stage fright, enhancing participation skills, and involving students in debates and discussion.

Course Code and Title: Eng 1120 / Eng20 Exposition and Argumentation

This course will provide participants the opportunity to continue to develop the necessary writing skills with special emphasis on expository, descriptive, persuasive (argumentative) and narrative writing. This course will introduce advanced writing concepts and continued emphasis will be place on writing according to the rules of good essay writing.

Course Code and Title: CS 53/CS 1570- Introduction to Programming

Programming design and development using C++. Emphasis placed on problem solving methods using good programming practices and algorithm design and development. Topics included are syntax/ semantics, logical, relational, and arithmetic operators, decision branching, loops, functions, file I/O, arrays, output formatting, C-strings, and an introduction to Object-Oriented Programming including the development and use of classes. **Prerequisite:** GFP 302 & 304

Course Code and Title: CS 158/CS 1200 - Discrete Mathematics for Computer Science

A rigorous treatment of topics from discrete mathematics which are essential to computer science. Principal topics include formal logic (propositional & predicate), proof techniques, mathematical induction, program correctness, sets, combinatorics, probability, relations, functions, matrices, graph theory and graph algorithms. **Prerequisite:** GFP 302 and 304.



Course Code and Title: MATH 8/MATH 1208 - Calculus with Analytical Geometry - I

A study of limits, continuity, differentiation, and integration of algebraic and trigonometric functions. Applications of these concepts in physical as well as mathematical settings are considered. **Prerequisites:** MATH 3/MATH 1103

Course Code and Title: Econ 1175 / Eco 75 Economic Development in the Gulf States

Principles and concepts of economic growth and development; theories of economic development, economic development since 1990s, factors of growth and development in the Gulf countries, employment, health, education, training, entrepreneurship, and its role in the development of the region; natural resources and its role in Gulf region.

Course Code and Title: Eng 1600 / Eng 65 Technical Writing

This course deals with writing that occurs in the workplace and allows the reader to take an action. It will equip students with the necessary range of skills to write in a range of technical documents. Students will analyze and produce texts appropriate to the communication of scientific, technological, and business data.

Course Code and Title: CS 153/CS 1510 - Data Structures

Continuation of Object-Oriented Programming, with emphasis on the efficient organization of data through Abstract Data Types and Data Structures. Topics include Linked Lists, Vectors, Stacks, Queues, Trees, Hash Tables, Graphs, and their use in a variety of algorithms. Recursive programming techniques are also covered. **Prerequisite:** CS53/CS 1570.

Course Code and Title: CS 284/CS 3800 - Introduction to Operating Systems

This course teaches the concepts, structure, and mechanisms of Operating Systems. Topics include process management, concurrency, synchronization, deadlock, multithreading, memory management, scheduling, and internetworking. Special emphasis is given to UNIX and its modern-day derivatives. **Prerequisites:** CS1/CS1010

Course Code and Title: Phil1335 / Phil35 Business Ethics

This course is an examination of the principles of ethics and issues that guide behavior in the world of business. The topics covered are corporate responsibility, employee rights, and the nature of the free enterprise system, environmental concern, and ethical business practices.

Course Code and Title: ENG 1160 / ENG 60 Writing & Research

Academic conventions of writing a research paper. Terminology and concepts of research: research proposal, thesis statement, bibliography, references, literature review, abstract, appendix, footnotes, acknowledgement, and table of content. The process of writing a research paper: formulation of thesis statement; writing a research proposal; follow ordering of table of contents in accordance with academic standards.



MIS 210 / MIS 3010 / IST 210 / IST 3010/ CS 210 / CS 3010:

The students work in the course is devoted to a seminar, for which they are expected to apply computing to their own area of interest. The seminar stated is as broadly as possible, and student's seminar ranges among the current trends in Information Systems in the real time business computing systems.

Course Code and Title: CS 253/CS 2500 - Algorithms

Students will solve recurrence relations, analyze algorithms for correctness and time/space complexity, apply these analysis techniques to fundamental dynamic programming, greedy, shortest-path, minimal spanning trees, and maximum flow algorithms and validate these analyses through programming. **Prerequisite:** CS153/CS1510

Course Code and Title: CS 263/CS 3600 - Introduction to Computer Security

This course encompasses threats and vulnerabilities, trust and security policies, and enforcement. Specific topics include access control, risk management, systems and applications life cycle, physical security, key management, transmission security, and cryptography.

Prerequisite: CS53/CS1570

Course Code and Title: CS 234/CS 2889 - Introduction to Computer Organization and Assembly

A detailed study designed to teach the building blocks of a computer system, assembly language programming and the basic computer organization concepts. Subjects include digital logic, performance issues, machine & assembly language, binary arithmetic, and the structure of an ALU. **Prerequisites:** CS153/CS1510

Course Code and Title: CS 304/CS 5300 - Database Management / Database Systems

This course introduces the advanced database concepts of normalization and functional dependencies, transaction models, concurrency and locking, timestamping, serializability, recovery techniques, and query planning and optimization. Students will participate in programming projects. **Prerequisite:** CS1/CS1010

Course Code and Title: Acc 1130/ Acc130 Accounting I

This course presents a comprehensive and practical approach to modern day principles of accounting. It focuses largely on the accounting for external reporting and the generation of financial information necessary for managerial decision making. This course gives students the opportunity to master accounting concepts and provides a firm foundation for further studies. This course introduces students to the conceptual structure of financial accounting in an effort to develop their ability to read, understand and interpret the general purpose of financial statements – [Income Statement, Position Statement, Statement of Retained Earnings, Cash Flow Statements] reported to investors and creditors of corporate business entities.



Course Code and Title: CS 285/CS 5600 - Computer Networks

This course focuses on the Internet and the general principles of computer networking. It covers the TCP/IP model from the application layer to the link layer in a top-down approach. It also exposes students to multimedia networking, network security, wireless and mobile networks. It is a networking class targeted for entry-level graduate students. **Prerequisite:** CS1/CS1010

Course Code and Title: CS 220/CS 2200 - Theory of Computer Science

This course will cover the theoretical underpinnings of computer science. This course will cover the following topics: basic computability and formal language concepts, regular languages, context free languages, recursively enumerable languages, and classes P, NP, and NP-completeness. **Prerequisite:** CS158/CS1200

Course Code and Title: MATH 21/MATH 1221 - Calculus with Analytical Geometry - II

A continuation of Math 8; differentiation and integration of elementary transcendental functions, integration techniques, improper integrals, conic sections, polar coordinates, introduction to sequences and series. **Prerequisites:** MATH 8 / MATH 1208

Course Code and Title: SOC 1100 / SOC 100 Omani Society:

This course is intended to provide the students with an understanding of the Omani Society and provide an overview of the different sectors of Oman, its geography and history, institutions and policies, access to law, values of society and culture.

Course Code and Title: CS 238/CS 2300 - File Structures and Introduction to Database Systems

Course covers major topics in file structures and database systems including techniques for disk access and organization, record and file structures, index structures, sequential file, dense/sparse and secondary indexes, B-trees, range queries, insertion/deletion, hash tables, fundamentals of database systems, the ER model, relational model, algebra, and SQL. **Prerequisite:** CS304/CS5300

Course Code and Title: CS 228/CS 3200 - Introduction to Numerical Methods

Finite difference interpolation, numerical differentiation and integration, linear systems of equations, solution of nonlinear equations, numerical solution of ordinary differential equations, computational techniques, and the programming of many problems on digital computers. **Prerequisites:** MATH21/MATH122

Course Code and Title: PHIL 212/PHIL 2001 - Ethics for Computer Usage

The course familiarizes the students with the fundamental concepts and principles of Computer Ethics. Topic covered includes the Philosophical Ethics, Professional Ethics, Property Rights of Computer Software, Accountability and Computer and Information Technology, Social implication, and Social Values. **Prerequisite:** None



Course Code and Title: MNGT4325 Mngt325 Entrepreneurship

This course is interdisciplinary, it is designed to help students unfold and develop their personal attributes required to become a successful entrepreneur through case studies, and creative problem solving. Students will identify, discuss, and grow an idea about a business they might start.

Course Code and Title: CS 236 / CS 3500 - Programming Languages and Translators

Covers basic design of programming languages, compilers, and interpreters. The concepts of syntax, variables, expressions, types, scope, functions, procedures, statements, I/O, exception handling and concurrency are introduced. The way various programming languages handle these concepts is discussed. **Prerequisite:** CS220/CS2200

Course Code and Title: CS 206/CS 3100 - Software Engineering – I

Development of methodologies useful in the software engineering classical life cycle. This includes requirements, design, implementation, and testing phases. These methodologies are reinforced through utilization of a CASE tool and a group project. **Prerequisite:** None

Course Code and Title: CS 272/CS 2501 - Java and Object Oriented Design

This course will cover Basic Java, Applets, Application, Classes, interfaces, Strings, Arrays, Generics, inheritance, Polymorphism, Algorithm and Object-Oriented Design, Software Testing, Exception Handling, File I/O. The use of Graphical User Interfaces in program design and introduction to Software Life Cycle. **Prerequisite:** CS53/CS1570

Course Code and Title: CS 397/CS 4096 - Capstone: Senior Design / Software System Development

Course will cover issues and problems relating to application and integration of business and management system skills, Group projects will require work as a member of a team, Creative Problem solving and application of business systems principles of real and simulated problems.

Prerequisite: Senior Level

Course Code and Title: CS 308/CS 5102 - Object-Oriented Analysis and Design

This course will explore principles, mechanisms, and methodologies in object-oriented analysis and design. An object-oriented programming language will be used as the vehicle for the exploration. **Prerequisite:** CS206/CS3100

Major Elective:

IST 211/IST 2211 - Web Design

A detailed study designed to teach the building blocks of e-commerce and Web designing. Subjects include basic concepts and architecture of e-commerce and designing, developing and hosting a web site through HTML, XML and advance web site features through Front Page, VBScript and ASP.



MATH 208/MATH 3108 – Special Problems (Linear Algebra)

Systems of linear equations, matrices, vector spaces, inner products, linear transformations, determinants, and eigenvalues are studied.

Prerequisite: MATH3/MATH1103

ERP 2110 Introduction to Enterprise Resource Planning: Prerequisite: IS&T 1750.

Fundamentals of enterprise resource planning (ERP) systems concepts, and the importance of integrated information systems in an organization. The focus of this course is on illustrating procurement, production, and sales business processes using ERP software. Use of SAP as an example ERP system.

Art 1180/ Art 80 Appreciation:

This course will provide essential knowledge in experiencing the visual arts. The course will develop critical understanding of Islamic, Egyptian and Roman arts. Participants will be exposed to fine arts, fabric and glass paintings and encouraged to do the same for their project. It provides firsthand experience in performing the skills they learn in their art class.

CS 3601 - Digital Forensics

Planning/managing incidents and response related to digital forensics; identifying, collecting, and preserving digital evidence; live/dead approaches covering systems as a whole emphasizing file system forensics; analysis and interpretation of artifacts culminating in a final project consisting of a collection, analysis, and report; legal and ethical issues.

Prerequisites: CS 3600

CS 5403 - Introduction to Robotics

This course provides an introduction to robotics, covering robot hardware, fundamental kinematics, trajectories, differential motion, robotic decision making, and an overview of current topics in robotics.

Prerequisite: CS53/CS1570

IST 351/IST 5251 - Leadership in Technology-Based Organizations

The course focuses on the knowledge and skills necessary for the development and implementation of effective strategies for the management of technology-based organizations. This involves: developing a general management perspective on technology and innovation, examining the problems of new product development, identifying distinctive technological competencies, licensing and marketing technologies, assessing the organizational and industrial context of technology. Prerequisite: Senior or Graduate Standing.

Prerequisite: IST50/IST1750



**IST 243/IST 3343 - System Analysis and Design**

Introduction to the processes by which business information systems are analyzed, designed, and introduced into the business environment. Topics include investigation of existing systems, requirements analysis, logical and physical design, database design, forms design, and report analysis. **Prerequisite:** IST50/IST1750

IST 4641 - Electronic and Mobile Commerce

Introduction to fundamental concepts of management and application to IT and support of commerce. Examines the use of IT in business processes and the management issues of integrating IT into organization processes to gain a competitive advantage. **Prerequisite:** IST50/IST1750

BUS 110 / BUS 1110 -Management and Organizational Behavior:

The course covers classic and current management principles as well as the study of the behavior of individuals and groups in an organizational setting. Topics include motivation, leadership, organizational design, and conflict resolution.

