

FIRST YEAR (FRESHMAN)

Course Code		Title	LC	LB	CR	Course Code		Title	LC	LB	CR
MATH	101	Calculus I	4	0	4	MATH	102	Calculus II	4	0	4
PHYS	101	General Physics I	3	3	4	PHYS	102	General Physics II	3	3	4
ENGL	101	An Introduction to Academic Discourse	3	0	3	ENGL	102	Introduction to Report Writing	3	0	3
CHEM	101	General Chemistry I	3	4	4	CSE	102	Introduction to Computing I	2	3	3
IAS	111	Belief and Its Consequences	2	0	2	IAS	101	Practical Grammar	2	0	2
PE	101	Health and Physical Education I	0	2	1	PE	102	Health and Physical Education II	0	2	1
			15	9	18				14	8	17

SECOND YEAR (SOPHOMORE)

Course Code		Title	LC	LB	CR	Course Code		Title	LC	LB	CR
EE	200	Digital Logic Circuit Design	3	3	4	CSE	253	Discrete Structures	3	0	3
CSE	201	Introduction to Computing II	3	3	4	MATH	280	Introduction to Linear Algebra	3	0	3
EE	211	Electric Circuits I	3	0	3	EE	203	Electronics I	3	3	4
MATH	201	Calculus III	3	0	3	CSE	202	Data Structures	3	3	4
IAS	212	Professional Ethics	2	0	2	BIOL	233	Biology for Engineers	2	3	3
ENGL	214	Academic and Professional Communication	3	0	3						
			17	6	19				14	9	17

THIRD YEAR (JUNIOR)

Course Code		Title	LC	LB	CR	Course Code		Title	LC	LB	CR
CSE	333	Computer Architecture and Assembly Language	3	3	4	STAT	319	Probability and Statistics for Engineers and Scientist	2	3	3
CSE	309	Professionalism and Ethics	1	0	1	CSE	353	Design and Analysis of Algorithms	3	0	3
SWE	205	Introduction to Software Engineering	3	0	3	CSE	343	Fundamentals of Computer Networks	3	3	4
CSE	324	Database Systems	3	3	4	CSE	375	Programming Languages	3	0	3
IAS	201	Writing for Professional Needs	2	0	2	CSE	xxx	Computer Science and Engineering Elective I	3	0	3
XXX	xxx	Free Elective I	3	0	3	IAS	301	Oral Communication Skills	2	0	2
			15	6	17				16	6	18
Summer Session						CSE	350	Begin Cooperative Work	0	0	0

FOURTH YEAR (SENIOR)

Course Code		Title	LC	LB	CR	Course Code		Title	LC	LB	CR
CSE	351	Cooperative Work	0	0	6	GS	xxx	General Studies Elective	3	0	3
						CSE	411	Senior Design Project	1	6	3
						CSE	401	Operating Systems	3	3	4
						CSE	xxx	Computer Science and Engineering Elective II	3	0	3
						XXX	xxx	Free Elective II	3	0	3
						IAS	322	Human Rights in Islam	2	0	2
			0	0	6				15	9	18

TOTAL CREDITS: 130



COURSE DESCRIPTION

CSE 102 Introduction to Computing I

(2-3-3)

Overview of computers and computing. Introduction to a typical object-oriented programming language. Basic data types and operators. Basic object-oriented concepts. Wrapper classes. Console input/output. Logical expressions and control structures. Classes and methods. Arrays and strings.

Co-requisite: MATH 101

CSE 103 Computer Programming in C

(2-3-3)

Overview of computer hardware and software. Programming in “C” with emphasis on modular and structured programming technique. Problem solving and algorithm development. Simple engineering and scientific problems.

Co-requisite: MATH 101

CSE 200 Fundamentals of Computing

(2-3-3)

Further data types: structures, unions, enumerated types. Pointers: pointers and functions, pointers and arrays, arrays of pointers. Dynamic memory allocation and dynamic memory structures. Low-level operations: bitwise operations. C, Unix and standard libraries: using UNIX system calls and library functions (particularly stdlib.h, math.h, stdio.h). Inter-process communication (IPC): pipes.

Prerequisite: CSE 103

CSE 201 Introduction to Computing II

(3-3-4)

Advanced object-oriented programming; inheritance; polymorphism; abstract classes and interfaces, container and collection classes, packages, object-oriented design, software modeling, event-driven programming, recursion, use of stacks, queues and lists from API, searching and sorting.

Prerequisite: CSE 102

CSE 202 Data Structures

(3-3-4)

Review of object-oriented concepts; Introduction to design patterns; Basic algorithms analysis; Fundamental data structures - implementation strategies for stacks, queues and linked lists; Recursion; Implementation strategies for tree and graph algorithms; Hash tables; Applications of data structures (e.g. data compression and memory management).

Prerequisite: CSE 102

CSE 253 Discrete Structures

(3-0-3)

Propositional Logic, Predicate Logic, Sets, Functions, Sequences and Summation, Proof Techniques, Mathematical induction, Inclusion-exclusion and Pigeonhole principles, Permutations and Combinations (with and without repetitions), The Binomial Theorem, Recurrence Relations; Graphs terminology and applications, Connectivity, Isomorphism, Euler and Hamilton Paths and Circuits, Planarity and Coloring; Trees terminology and applications.

Prerequisite: CSE 102

CSE 309 Professionalism and Ethics

(1-0-1)

Social, ethical, and professional issues facing computing professionals; ethical principles; discussion of case studies.

Prerequisite: Junior Standing



CSE 324 Database Systems

(3-3-4)

Basic database concepts, conceptual data modeling, relational data model, relational theory and languages, database design, SQL, introduction to query processing and optimization, and introduction to concurrency and recovery.

Prerequisite: CSE 202

CSE 333 Computer Architecture and Assembly Language

(3-3-4)

Machine organization; assembly language: addressing, stacks, argument passing, arithmetic operations, decisions, modularization; Input/Output Operations and Interrupts; Memory Hierarchy and Cache memory; Pipeline Design Techniques; Super-scalar architecture; Parallel Architectures.

Prerequisite: CSE 201& EE 200

CSE 342 Computer Networks

(2-3-3)

Introduction to computer networks. Circuit, message, packet and cell switching. The OSI model. WAN and LAN design issues. LAN standards. Network layer design issues. Routing and congestion control. Internetworking. Transport layer design issues and protocols. Application layer design issues and protocols.

Prerequisites: Junior Standing

CSE 343 Fundamentals of Computer Networks

(3-3-4)

Introduction to computer networks and layered architectures: connectivity, topology, circuit and packet switching, TCP/IP and ISO models; Application layer: C/S model, DNS, SMTP, FTP, WWW, socket programming and network security; Transport layer: TCP and UDP, congestion control; Network layer: internetworking, addressing and routing algorithms and protocols; Data link layer: framing, flow and error control protocols, PPP, MAC and LANs; Physical layer: principles of data communications, circuit switching, coding, multiplexing and transmission media.

Prerequisite: CSE 201

CSE 350 Cooperative work

(0-0-0)

Beginning of Coop in summer. Description is as given in CSE 351.

Prerequisite: CSE 324, SWE 205, ENGL 214, Major GPA ≥ 2 , Completion of at least 85 hours, Department Approval

CSE 351 Cooperative work

(0-0-6)

A continuous period of 28 weeks spent as a normal employee in industry, business, or government agencies with the purpose of familiarizing students with the real world of work and enabling them to integrate their classroom learning to a real work environment. During this period, a student is exposed to a real-life work in the field. Each student is required to participate with at least one project. Students are required to submit progress reports during the work period. Students are also required to give a presentation and submit a final report on their experience and the knowledge they gained during their cooperative.

Prerequisite: CSE 324, SWE 205, ENGL 214, Department Approval

CSE 352 End Cooperative work

(0-0-0)

This course is for students who choose to start their coop program during the second term of the academic year.

Prerequisite: CSE 351



CSE 353 Design and Analysis of Algorithms

(3-0-3)

Algorithms and Problem Solving; Basic Algorithmic Analysis; Advanced algorithmic analysis; Advanced Data Structures; Algorithmic strategies & Analysis of fundamental computing algorithms; Basic computability; The complexity classes P and NP.

Prerequisites: CSE 202 and CS 253

CSE 375 Programming Languages

(3-0-3)

Programming Paradigms: Object-oriented, imperative, functional, and logic. Application development in these paradigms. Fundamentals of Language Design: Syntax and Semantics. Language implementation: virtual machines; compilation, interpretation, and hybrid.

Prerequisite: CSE 202

CSE 381 Principles of Artificial Intelligence

(3-0-3)

Introduction to Artificial Intelligence (AI) history and applications; First order logic; State space representation; Blind and heuristic search; Constraint satisfaction and planning; Knowledge representation; Reasoning in uncertain situations; Machine learning; Prolog programming; Natural language processing, Expert systems and real AI applications.

Prerequisite: CSE 253

CSE 401 Operating Systems

(3-3-4)

This course introduces the fundamentals of operating systems design and implementation. Topics include history and evolution of operating systems; Types of operating systems; Operating system structures; Process management: processes, threads, CPU scheduling, process synchronization; Memory management and virtual memory; File systems; I/O systems; Security and protection; Distributed systems; Case studies.

Prerequisite: CSE 333

CSE 411 Senior Design Project

(1-6-3)

The student will work on an applied project designed to develop his interest in some application of computer technology to a real life problem. Student is expected to submit a written report at the end of the project.

Prerequisite: SWE 205 and CSE 324

CSE 415 Computer Graphics

(3-0-3)

Applications of Computer Graphics; Graphics systems and devices; Output Primitives and their Attributes; Geometric Transformations; Window to Viewport Mapping and Clipping; Curves and Surfaces; Three-Dimensional viewing; Hidden surface removal; illumination and color models, Animation.

Prerequisite: CSE 202

CSE 424 Advanced Database Systems

(3-0-3)

Advanced data models: object-oriented model, and object-relational model, conceptual database design. Transaction processing: transactions, failure and recovery, and concurrency control techniques. Database backup and recovery. Query processing and optimization. Database security. Distributed databases: distributed data storage, distributed query processing, distributed transaction processing and concurrency control. Homogeneous and heterogeneous solutions, client-server architecture. XML and relational databases. Introduction to data warehousing, introduction to other current trends in database systems.

Prerequisite: CSE 324



CSE 426 Data Warehousing and Data Mining

(3-0-3)

Review of relational databases and Conjunctive queries, Data Warehousing Concepts and OLAP, Data Warehouse Design and Development, Information and data Integration, OLAP Technology for Data Mining. Data Mining: Primitive, Languages and Application Developments.

Prerequisite: CSE 324

CSE 436 Internetwork Design and Management

(3-0-3)

Overview of computer networks. Principles of internetworking. Internetworking hardware. Bridging and switching technologies. Virtual LANs. Routing strategies. The network development life cycle. Network analysis and design methodology. Enterprise network design model. Backbone design concepts. Network security design. Structured cabling systems. Network design algorithms. Traffic flow analysis. Network reliability. Network management (SNMP). Network administration. Case studies.

Prerequisite: CSE 343

CSE 445 Internet Engineering and Technologies

(3-0-3)

Overview of current internet challenges and its next generation architecture. Overview of modern Internet protocols and supporting algorithms. Information retrieval architecture, design, and performance evaluation: search engines, proxy servers, and content distribution networks. Network programming.

Prerequisite: CSE 343

CSE 446 Mobile Computing

(3-0-3)

Introduction to different types of mobile computing; cellular networks, wireless mobile ad hoc and sensor networks, wireless LAN and so on. Discussion of different IEEE standardized protocols and their implementation and performances. New wireless technologies such as LTE and LTE advance. Quality of Service (QoS) issues. Modeling and optimization methods of wireless protocols.

Prerequisite: CSE 343

CSE 448 Pervasive and Ubiquitous Computing

(3-0-3)

Introduction to ubiquitous and pervasive computing. Designing, building and evaluating ubiquitous computing technologies in order to create novel user experiences. Capturing and disseminating context information through sensors and sensor networks. Sensor network coverage, localization, synchronization, sleep scheduling, connectivity, routing, energy efficiency, data centric and transport protocols. Context-aware applications and intelligent objects and applications.

Prerequisite: CSE 343

CSE 451 Computer & Network Security

(3-0-3)

Introduction to computer security (concepts, threats, attacks, assets, scope, trends). Cryptographic Protocols and standards. Integrity verification mechanisms. Wireless network security and associated protocols. Software tools to apply security in user environments. Access Control models and mechanisms. Database security, Intrusion detection systems, Firewalls. Malicious software, DoS attacks, Trusted computing and multilevel security.

Prerequisite: CSE 343

CSE 483 Computer Vision

(3-0-3)

Image acquisition, The digital image and its properties, Image preprocessing, Segmentation (thresholding, edge- and region-based segmentation), Shape representation and object recognition, Motion analysis, Case studies (object recognition / object tracking).

Prerequisite: Math 102, Math 280, Department approval

CSE 490 Special Topics I

(3-0-3)

State-of-the-art topics in Computer Science and Engineering.

Prerequisite: Department approval.

CSE 491 Special Topics II

(3-0-3)

State-of-the-art topics in Computer Science and Engineering.

Prerequisite: Department approval

SWE 205 Introduction to Software Engineering

(3-0-3)

Introduction to software engineering and software processes. Construction techniques and principals. Concepts of Programming Languages: Syntax and semantics . Analysis and Design Modes. Ethical and professional responsibilities.

Prerequisites: CSE 102

