



Punjab University College of Information Technology

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Dr. Muhammad Shahid Soroya,
The Director General,
The Punjab Higher Education Commission,
10th Floor, Arfa Software Technology Park,
346-B, Ferozepur Road, Lahore

Subject: List of Courses for 3rd Semester Associate Degree Program

This is with reference to your letter having reference number PHEC/(PD&R) 5-2/V2/2017/1119. The course outlines of the 3rd semester for both the specializations (Web Technologies and Computer Networking) are attached as Annexure I. The course outlines of 1st and 2nd semester have already been sent to your office.

Thank You.


26.09.17

Prof. Dr. Syed Mansoor Sarwar
Principal
Punjab University College
of Information Technology
University of the Punjab, Lahore

CC: Registrar, University of the Punjab

Scheme of studies for BS Web Technology

Semester 1	Semester 2	Semester 3	Semester 4
Introduction to Computing	Programming Fundamentals	Object Oriented Programming	Data Structures and Algorithms
Calculus-I	Calculus II	Discrete Mathematics	Probability and Statistics
Mechanics and Wave Motion	Electricity and Magnetism	Communication Skills	Enterprise Application Development
Writing Workshop	Pakistan Studies	Internet Programing	Business and Technical Writing
Islamayat/Ethics	Digital Logic Design	Database Systems	Software Engineering
	Digital Logic Design Lab	Database Systems Lab	Data Structures and Algorithms Lab
	Programming Fundamentals Lab	Object Oriented Programming Lab	Enterprise Application Development Lab
Total CHrs:14	Total CHrs:16	Total CHrs:17	Total CHrs:17



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Scheme of studies for BS Information Technology (Computer Network)

Semester 1	Semester 2	Semester 3	Semester 4
Introduction to Computing	Programming Fundamentals	Object Oriented Programming	Data Structures and Algorithms
Calculus-I	Calculus II	Discrete Mathematics	Probability and Statistics
Mechanics and Wave Motion	Electricity and Magnetism	Communication Skills	Network Administration
Writing Workshop	Pakistan Studies	Data Communication and Networking	Business and Technical Writing
Islamayat/Ethics	Digital Logic Design	Database Systems	Software Engineering
	Digital Logic Design Lab	Database Systems Lab	Data Structures and Algorithms Lab
	Programming Fundamentals Lab	Object Oriented Programming Lab	Network Administration Lab
Total CHrs:14	Total CHrs:16	Total CHrs:17	Total CHrs:17



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Semester 3

Web Technology Track

Object Oriented Programming

3 Credit Hours

Objectives

The course aims to focus on object-oriented concepts, analysis and software development. The following topics will be covered in the course: Evolution of OO, OO concepts and principles, problem solving in OO paradigm, OO program design process, classes, methods, objects and encapsulation, constructors and destructors, operator and function overloading, virtual functions, derived classes, inheritance and polymorphism, I/O and file processing, exception handling.

Prerequisites

Introduction to Computing, Programming Fundamentals

Text Book

R. Lafore, *Object-Oriented Programming in C++*, 4th Edition, Sams publishing, 2002.

Reference Material

- Deitel and Deitel, *C++: How to Program*, 4/e, Pearson.
 - Bruce Eckel, *Thinking in C++*, 2nd Edition, Prentice Hall.
 - D.S. Malik, *C++ Programming*, 4th Edition, Thomson, 2008.
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Object Oriented Programming Lab

1 Credit Hours

Relevant to the above topics

Discrete Mathematics

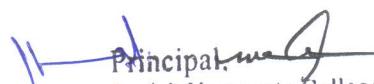
3 Credit Hours

Objectives

This course introduces the foundations of discrete mathematics as they apply to Computer Science, focusing on providing a solid theoretical foundation for further work. It aims to develop understanding and appreciation of the finite nature inherent in most Computer Science problems and structures through study of combinatorial reasoning, abstract algebra, iterative procedures, predicate calculus, tree and graph structures. The following topics will be covered in the course: Introduction to logic and proofs, Direct proofs, proof by contradiction, Sets, Combinatorics, Sequences, Formal logic, Prepositional and predicate calculus, Methods of Proof, Mathematical Induction and Recursion, loop invariants, Relations and functions, Pigeon hole principle, Trees and Graphs, Elementary number theory, Optimization and matching, Fundamental structures, Functions (surjections, injections, inverses, composition), relations (reflexivity, symmetry, transitivity, equivalence relations), sets (Venn diagrams, complements, Cartesian products, power sets), pigeonhole principle; cardinality and countability.

Prerequisites

None


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Text Book

Rosen, *Discrete Mathematics and Its Applications*, 5th edition, McGraw-Hill, ISBN: 0072424346

Reference Material

- Richard Johnsonbaugh, *Discrete Mathematics*, Prentice Hall, ISBN: 0135182425
 - Kolman, Busby & Ross, *Discrete Mathematical Structures*, 4th Edition, 2000, Prentice-Hall, ISBN: 0130831433
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Communication Skills

3 Credit Hours

Objectives

The aim of this course is to develop good English writing, language usage and reading skills, to appreciate the importance of business communication and to develop understanding of communication concepts, principles, theories and problems. It will also help in developing good oral communication and presentation skills. The following topics will be covered in the course: Principles of writing good English, understanding the composition process, Comprehension and expression, Use of grammar and punctuation, Process of writing, observing, audience collecting, composing, drafting and revising, persuasive writing, reading skills, listening skills and comprehension, skills for taking notes, Business communications, planning messages, writing concise but with impact, Letter formats, mechanics of business, letter writing, letters, memo and applications, summaries, proposals, writing resumes, styles and formats, oral communications, verbal and nonverbal communication, conducting meetings, small group communication, taking minutes, Presentation skills, Presentation strategies, material gathering, material organization strategies, time management, opening and concluding, use of audio-visual aids, delivery and presentation.

Prerequisites

None

Text Book

Vawdrey, Stoddard, Bell, *Practical Business English*, ISBN-10: 0256102740

Reference Material

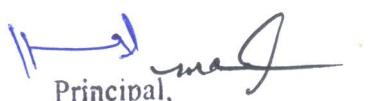
- Herta A. Murphy, *Effective Business Communication*, ISBN-10: 007044398X
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Internet Programming

3 Credit Hours

Objectives

Introduction to course, how to write a Java program, introduction to JVM, JRE and JDK, differences between C++ and Java, Java primitive data-types, Java operators, string class in Java, constants, decision structures in Java, break and continue statements, loops (while, do-while, for, for-each), functions, parameter passing in functions, recursion in Java, classes and objects, constructors and destructors, function and constructors overloading, this keyword, access modifiers, static keyword, command-line arguments, packages, abstract classes, interfaces, arrays, type safe and unsafe collections (ArrayList, Dictionary) in Java, wrapper classes, generic classes, inheritance and polymorphism in Java, method overriding, exception handling in Java, custom exceptions, file handling in Java, serialization and de-serialization, Java database connectivity, threading in Java, network programming (TCP and UDP), remote method



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invocation (RMI), graphical user interface (GUI), AWT and Swing packages, Layout managers, Event-handling in Java and Java Beans.

Prerequisites

Programming Fundamentals

Text Book

Java: The Complete Reference by Herbert Schildt

Reference Material

- Java 2, How to Program Deitel, Deitel & Neito
 - Starting Out with Java: From Control Structures through Objects by Tony Gaddis
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Database Systems

3 Credit Hours

Objectives

The course aims to introduce basic database concepts, different data models, data storage and retrieval techniques and database design techniques. The course primarily focuses on relational data model and DBMS concepts. The following topics will be covered in the course: Traditional File Based Systems, Roles in Database Environment, ANSI-SPARC Architecture, Data Manipulation Language (DML), Data Models, Multi-User DBMS Architectures, Relational Data Structures, Database Schemas, Relational Integrity, Introduction to SQL, Data Manipulation, Creating a Database, Tables, Index, Views, Transactions, Database Application Life Cycle, Database Planning, Database Design, Data Administration & Database Administration, Entity Types, Relationship Types, Structural Constraints, Problems with ER Models, Specialization/Generalization For EERD, Anomalies, Functional Dependency, Process of Normalization, Database Design Methodology, Database Security, Client Server Architecture, Centralized and Distributed Databases, Advance Topics.

Prerequisites

Data Structures and Algorithms

Text Book

C.J.Date, *Database Systems*, Addison Wesley Publications Co., 2004. ISBN-10: 0321197844

Reference Material

- R.Connolly and P.Begg, *Database Systems: A Practical Approach to Design, Implementation and Management*, Addison-Wesley Publications Company, 2003. ISBN-10: 0201342871
 - Elmasri and Navathe, *Fundamentals of Database Systems*, 3/E, Addison-Wesley, ISBN: 0201741539
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Database Systems Lab

1 Credit Hours

Relevant to the above topics



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Semester 3 **Computer Networks Track**

Object Oriented Programming	3 Credit Hours
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Objectives

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Prerequisites

Programming Fundamentals

Text Book

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Object Oriented Programming Lab	1 Credit Hours
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Relevant to the above topics

Discrete Mathematics	3 Credit Hours
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Objectives

This course introduces the foundations of discrete mathematics as they apply to Computer Science, focusing on providing a solid theoretical foundation for further work. It aims to develop understanding and appreciation of the finite nature inherent in most Computer Science problems and structures through study of combinatorial reasoning, abstract algebra, iterative procedures, predicate calculus, tree and graph structures. The following topics will be covered in the course: Introduction to logic and proofs, Direct proofs, proof by contradiction, Sets, Combinatorics, Sequences, Formal logic, Prepositional and predicate calculus, Methods of Proof, Mathematical Induction and Recursion, loop invariants, Relations and functions, Pigeon hole principle, Trees and Graphs, Elementary number theory, Optimization and matching, Fundamental structures, Functions (surjections, injections, inverses, composition), relations (reflexivity, symmetry, transitivity, equivalence relations), sets (Venn diagrams, complements, Cartesian products, power sets), pigeonhole principle; cardinality and countability.

Prerequisites

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Prerequisites

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Text Book

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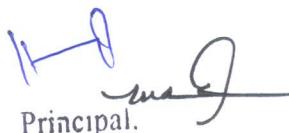
- Herta A. Murphy, *Effective Business Communication*, ISBN-10: 007044398X
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Data Communication and Networking

3 Credit Hours

Objectives

Introduction to Data Communication and Networks, the Internet, Protocols and Standards, Layered Tasks, OSI Model, Layers in the OSI Model and their Brief Functionality, TCP/IP Protocol Suite, Physical Addresses ,Logical Addresses, Port Addresses, Analog and Digital Signals, Periodic Analog Signals, Digital Signals, Transmission Impairment ,Data Rate Limits, Performance, Frequency Division Multiplexing , Wavelength Division Multiplexing, Time Division Multiplexing, Guided media, Unguided Media, Types of Errors, Redundancy, Linear Block Codes, Cyclic Codes, Framing, Flow and Error Control, CSMA/CD, CSMA/CA, Standard Ethernet, Fast Ethernet, Gigabit Ethernet, Connecting Devices, Passive and Active Hubs, Bridges, Switches, Routers, IPV4 addressing, Classful Addressing, Classless Addressing, Network Address Translation, Internetworking, Need of Network Layer, Internet as a Datagram Network, Internet as a Connectionless Network, IPv4 Datagram, Fragmentation, Checksum. Forwarding Techniques, Forwarding Process, Routing Table, UDP: Well-Known Ports for UDP, User Datagram, Checksum, UDP Operation, Use of UDP. TCP: TCP Services, TCP Features.



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Prerequisites

None

Text Book

Behrouz A. Forouzan, Data Communications and Networking, 4th Edition, ISBN-13 978-0-07-296775-3

Reference Material

Andrew S. Tanenbaum, Computer Networks, 5th Edition, ISBN 10: 0-13-212695-8

Database Systems

3 Credit Hours

Objectives

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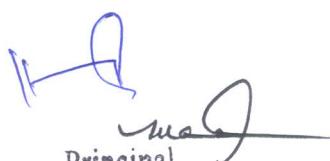
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1 Credit Hours

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