

Syllabus for
Post Graduate Diploma in Information Technologies (PGDIT)
2016 Onwards

Institute of Information Technology (IIT)
Jahangirnagar University



About the Institute:

Institute of Information Technology of Jahangirnagar University (IIT-JU) started its journey on October 2009 to create efficient Information & Communication Technology professionals. The erstwhile Computer and Information Technology Institute (CITI) previously (known as Computer Center) of JU has been taken as the backbone of the institute. IIT-JU currently offers Bachelor of Science in Information and Communication Technology (BICT), Master of Science in Information and Communication Technology (MICT), Master of Philosophy (MPhil) in Information and Communication Technology, Doctor of Philosophy (Ph.D) in Information and Communication Technology, Professional Master in Information Technology (MIT) and Post Graduate Diploma in Information Technology (PGDIT). This institute also offers short certificate courses and all modules of CCNA. In addition, IIT is conducting state-of-the-art research works in collaboration of industries and foreign universities.

Vision:

The vision of the IIT-JU is to enlighten the students through need-based academic innovation and research works and prepare them for the real-life challenges in the field of ICT.

Mission:

The mission of IIT-JU is to create splendid students by enhancing knowledge and competitiveness through excellent education, hands-on experience, state-of-the-art research and industry collaboration

Program objectives:

The program objectives of IIT-JU are as follows:

1. Practice and grow towards ICT professionals,
2. Possess sufficient theoretical and practical knowledge of ICT sufficient to earn a living and contribute to economic development.
3. Work in a team, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
4. Apply the ethical and social aspects of modern computing and technology to the design, development, and usage of computing artefacts; and,
5. Be prepared for advanced post-graduate studies in ICT.
6. Stimulate self-confidence through the knowledge and application of technology
7. Recognize ethical and professional responsibilities and solve the engineering problem in societal and global contexts

PGD IN IT AT A GLANCE:

Duration of Program	One academic year consisting of three trimesters				
Duration of each Semester	Four months				
Total Credit Hour	36				
Credit in each Course	3				
Course Structure		Core Course	Optional Course	Project Work	Total Credit
	Semester I	04	-	-	4 × 3 = 12
	Semester II	03	01	-	4 × 3 = 12
	Semester III	01	01	6 Credit	3 + 3 + 6 = 12
	Grand Total Credit				12 + 12 + 12 = 36



**Syllabus for the
Post Graduate Diploma in Information Technology (PGDIT)
[Effective from 2016 Onwards]**

**Institute of Information Technology (IIT)
Jahangirnagar University
Savar, Dhaka-1342, Bangladesh.**

OVERVIEW OF THE PGDIT PROGRAM:

- ▶ Duration of Program: One Year (Consisting of Three Trimester)
- ▶ Duration of each Trimester: 4 Months
- ▶ Structure of PGDIT Program: 10 (Ten) Courses + 6 (Six) Credit Hours Project
- ▶ Total Credit Hours: $10 \times 3 + 6 = 36$
- ▶ Class Time: Friday and/or Saturday

1. SHORT DESCRIPTION OF THE PROGRAM:

Post Graduate Diploma in Information Technology (abbreviated as **PGDIT**) is a one-year program for graduates in any discipline on the principles and practices of Information Technology. The program will be conducted by the **Institute of Information Technology (IIT)** of **Jahangirnagar University (JU)**. The PGDIT program is offered mainly to the graduates who are willing to work in ICT domain or the graduates whose current or future career could be accelerated through advanced knowledge in ICT. Most of the classes of the program will run on Fridays/ Saturdays.

2. PROGRAM STRUCTURE AND DURATION:

The PGDIT program is a one-year program consisting of three trimesters; each has duration of four months. Each trimester will be segmented into Class Weeks, Preparatory Leave and Semester-end Examination. The total time distribution for completing a semester will be as follows:

Segment	Length
Class Weeks	12 Weeks
Preparatory Leave (before semester-end examination)	01 Weeks
Semester Final Examination	02 Weeks
Result Publication	01 Weeks
Semester Break	01 Weeks
Total	17 Weeks

3. COURSE STRUCTURE (10 × 3 = 30 + 6 = 36 CREDITS):

Each student will have to take a total of 10 courses along with a project work in the PGDIT program. Course structure is given below:

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	Semester II	03	01	-	4 × 3 = 12
	Semester III	01	01	6 Credit	3 + 3 + 6 = 12
	Grand Total Credit				12 + 12 + 12 = 36

4. TUTION AND OTHER FEE STRUCTURES OF PGDIT PROGRAM:

Program fee may vary from session to session (inflation). The fee for specific session is declared during admission call. Total fee set for completion of PGDIT program is Tk. 90,000. The payment can be made in installments. The fee structure for each student of PGDIT program will be as follows:

Fee Structure (At a glance)

Description	Total Cost (BDT)
Admission Fee	8,000/-
Seminar Library Fee	4,000/-
Trimester Fee (Tk. 2000/trimester)	2000 × 3 = 6,000/-
Course Fee (Tk. 2000/credit)	2000 × 36 = 72,000/-
Total	90,000/-

Fee Structure (Trimester wise)

1st Installment (At the time of Admission)	
Admission Fee	8,000/-
Seminar Library fee	4,000/-
1 st Semester Fee	2,000/-
1 st Semester Course Fee (Tk. 2000/credit × 12 credits)	24,000/-
Total (BDT):	38,000/-

2nd Installment (Beginning of the 2nd Semester)	
2 nd Semester Fee	2,000/-
2 nd Semester Course Fee (Tk. 2000/credit × 12 credits)	24,000/-
Total (BDT):	26,000/-

3rd Installment (Beginning of the 3rd Semester)	
3 rd Semester Fee	2,000/-
3 rd Semester Course Fee (Tk. 2000/credit × 12 credits)	24,000/-
Total (BDT):	26,000/-

5. DISTRIBUTION OF COURSES:

Each student will have to take following number of courses in the given trimester:

1. **First Trimester:** Four Core Courses (4 × 3 = 15 credit-hours)
2. **Second Trimester:** Three Core Courses and 1 Optional Course ((3 + 1) × 3 = 12 credit-hours)
3. **Third Trimester:** One Core Course and One Optional Course and a Project Work (3 + 3 + 6 = 12 credit-hours)

The courses to be offered in a particular trimester will be decided by the PGDIT Coordination Committee. However, project proposal will be submitted and presented at the end of 3rd trimester. Each course is conducted by a course teacher who is responsible for maintaining the expected standard of the course and for the assessment of students' performance.

1st Trimester

Course Code	Course Title	Credit hours
PGDIT-101	Introduction to IT & Programming	3.0
PGDIT-102	Operating System Concepts	3.0
PGDIT-103	Data Structures and Algorithms	3.0
PGDIT-104	Database Management System	3.0

2nd Trimester

PGDIT-201	System Analysis and Design	3.0
PGDIT-202	Object Oriented Programming	3.0
PGDIT-203	Data Communication & Computer Networking	3.0
PGDIT-214	E-Commerce	3.0

3rd Trimester

PGDIT-301	Web Programming	3.0
PGDIT-315	Network Security	3.0
PGDIT-300	Project Work	6.0

Core Courses

PGDIT-101	Introduction to IT & Programming	3.0
PGDIT-102	Operating System Concepts	3.0
PGDIT-103	Data Structures and Algorithms	3.0
PGDIT-104	Database Management System	3.0
PGDIT-201	System Analysis and Design	3.0
PGDIT-202	Object Oriented Programming	3.0
PGDIT-203	Data Communication & Computer Networking	3.0
PGDIT-301	Web Programming	3.0
PGDIT-300	Project Work	6.0

Optional Courses

PGDIT-211	Telecommunication Fundamentals	3.0
PGDIT-212	Cloud Computing Basics	3.0
PGDIT-213	Microcontroller & Embedded Systems	3.0
PGDIT-214	E-Commerce	3.0
PGDIT-311	Mobile Application	3.0
PGDIT-312	Software Engineering	3.0
PGDIT-313	DOT Net Technology	3.0
PGDIT-314	Artificial Intelligence and Neural Network	3.0
PGDIT-315	Network Security	3.0

6. MARKS DISTRIBUTION AND COURSE EVALUATION:

The performance of a student in a given course will be based on continuous assessment and course final examinations. Marks distribution for a course can be as follows:

Attendance	10%
Tutorial/Quiz/Presentation/CT	20%
Lab	10%
Final Exam.	60%

Total Marks	100%
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The continuous assessment may consist of class tests, quiz, attendance, seminars/ presentations/ viva-voce, assignments, completion of projects etc. The mentioned criteria to assess a student will be justified by individual course teacher and he/she may set his/her own assessment criteria. Each course teacher should provide course outline mentioning the assessment and evaluation process within the first week of class.

7. GRADING SYSTEM:

The Universal Grading System introduced by the **University Grant Commission (UGC)** of Bangladesh, will be followed which are given below. The total numerical marks obtained by a student in each course will be converted into Letter Grade (LG) and Grade Point (GP). According to the Grade Point, the GPA (Grade Point Average) and CGPA (Cumulative Grade Point Average) will be calculated. The conversion of Letter Grade and Grade Point will be as follows:

Numerical Grade	Letter Grade		Grade Points
80% and above	A+	(A Plus)	4.00
75% to less than 80%	A	(A Regular)	3.75
70% to less than 75%	A-	(A Minus)	3.50
65% to less than 70%	B+	(B Plus)	3.25
60% to less than 65%	B	(B Regular)	3.00

Institute of Information Technology (IIT), Jahangirnagar University

55% to less than 60%	B-	(B Minus)	2.75
50% to less than 55%	C+	(C Plus)	2.50
45% to less than 50%	C	(C Regular)	2.25
40% to less than 45%	D		2.00
Less than 40%	F		0.00
Incomplete	I		
Satisfactory or Unsatisfactory	S or U		For Thesis, Industrial/ Professional Tanning etc.
Continuation	X		For Thesis, Industrial Attachment etc.

8. IMPROVEMENT/REPEATER:

If any student obtains less than B grade in the final examination or (s)he remains absent in the final examination due to serious illness, accident etc, then (s)he will get a chance to improve/repeat his/her final exam by paying Tk. 2000/- in each course.

9. DEGREE COMPLETION REQUIREMENT:

The requirements for awarding PGDIT degree are-

1. Completion of minimum 36 credits, and
2. Passing of all courses individually with at least D grade, and
3. Cumulative Grade Point Average (CGPA) of 2.5 or above.

10. MISCELLANEOUS:

1. Enrollment to PGDIT program is valid for 3 years after the date of admission.
2. After successful completion of the programme, a student will be awarded a certificate showing the CGPA and a transcript showing details of grades obtained in three trimesters.
3. Students of PGDIT program are not allowed to accommodate the hall of residence, transport and medical facility of Jahangirnagar University. However, they will be given separate transport facility provided by the PGDIT Coordination Committee.
4. Detailed academic calendar for the specific session will be provided before call for admission of the specific session.
5. Application for admission implies agreeing to abide by the rules and regulations of the IIT and as well as Jahangirnagar University.
6. The IIT authority will resolve any other points not mentioned in the document.

Detailed Course Outline

FOR

POST GRADUATE DIPLOMA IN INFORMATION TECHNOLOGY (PGDIT)

Core Courses

PGDIT-101 : Introduction to IT and Programming

COURSE OBJECTIVES:

Following this course students will be able to:

1. Learn the concepts of computer & programming fundamentals
2. Describe the IT fundamentals and its applications.
3. Understand the basic e-commerce, information security, and Information Management.

COURSE CONTENTS:

Introduction to computations early history of computing services; computers, major components of a computer: Hardware processor memory --- devices software Operating System, application software Basic architecture of a computer; Basic Information Technology the Internet, Number system binary octal, hexadecimal, decimal binary arithmetic, program development stages, flow charts, Introduction to IT for telecom networks, IT applications, intelligent systems and E-commerce, Information Technology and systems, Information Security, Multimedia, Management Information System (MIS).

Introduction to programming and logic flow, procedural versus object oriented programming, data types, variables, constants, operators, expressions, input-output, control structures, arrays, functions, pointers, file access, structures, dynamic memory allocation, classes, objects, constructor and destructor, inheritance, polymorphism, file, exception handling.

COURSE OUTCOMES:

After completing this course students will be able to:

1. Understand the concept of input and output devices, processors and memory of Computers and how it works and recognize the basic terminology used in computer programming
2. Design programs connecting decision structures, loops and functions.
3. Get the concepts of e-commerce, information security, multimedia and Management Information System (MIS).

Books Recommended:

1. Introduction to Information Technology, Pearson Education, IITL Education Solutions Ltd.
2. Computer and Information Processing- William M. Fouri
3. Programming in C- E Balaguru Swami
4. Computer Fundamentals and ICT, M Lutfar Rahman

PGDIT-102: Operating System Concepts

COURSE OBJECTIVES:

The objective of this course is to

1. Understand the basic components of a computer operating system, and the interactions among the various components.
2. Provide an introduction on the policies for scheduling.
3. Covers deadlocks, memory management, synchronization, main memory, virtual memory, and file systems.

COURSE CONTENTS:

Overview of operating system and its role in computer systems, Process process model, Interposes communication, thread model; CPU scheduling; Memory management, virtual memory, address translation; File systems; files, directories, protection and security; Input, Output; Deadlock, Introduction to UNIX, UNIX kernel, UNIX commands, services, device structure, memory structure, process and jobs, file system and the management, vi and emacs editors, shell programming, LINUX: user management, privilege, using rpm, using configuration files.

COURSE OUTCOMES:

After completing this course students will be able to:

1. Describe and explain the fundamental components of a computer operating system.
2. Define, restate, discuss, and explain the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems.
3. Describe and extrapolate the interactions among the various components of computing systems.
4. Design and construct the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems.

Books Recommended:

1. Silberschatz, Galvin, Gagne—Operating System Concepts, John Wiley & Sons, Inc.
2. Andrew S. Tanenbaum, Albert S. Woodhull --- Operating System: Design and Implementation, Prentice-Hall India.
3. Nutt G. J., Operating Systems-A Modern Perspective, Pearson Education Asia
4. William Stallings---Operating Systems: Internals and Design principles

PGD103 : Data Structures & Algorithms

COURSE OBJECTIVES:

Following this course students will be able to:

- Familiarize the student with good programming design methods, particularly TopDown design.
- Develop algorithms for manipulating stacks, queues, linked lists, trees, and graphs.
- Develop the data structures for implementing the above algorithms.
- Develop recursive algorithms as they apply to trees and graphs.
- Familiarize the student with the issues of Time complexity and examine various algorithms from this perspective.

COURSE CONTENTS:

Introduction to elementary data structures: arrays, records, linked lists, stacks, queues, trees; complexity analysis of algorithms; Basic search and traversal techniques; Sorting algorithms; Methods for the design of efficient algorithms; recursion, divide and conquer, greedy method, dynamic programming; Graph algorithms.

COURSE OUTCOMES:

After completing this course satisfactorily, a student will be able to:

1. Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms.
2. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs.
3. Compare and contrast the benefits of dynamic and static data structures implementations.
4. Describe the concept of recursion, give examples of its use, and describe how it can be implemented. .
5. Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

Books Recommended:

1. Data Structure and Algorithm- Schaum’s Outline Series
2. Fundamentals of Data Structures- Horowitz E. and Sahni, S Galgotia
3. Data Structures and Program Design in C- Kruse/Tondo/Leung (Prentice-Hall)
4. Wirth N, Algorithms + Data Structures= Programs, Prentice Hall

PGDIT-104 : Database Management System

COURSE OBJECTIVES:

Following this course students will be able to:

1. List and explain the fundamental concepts of a relational database system.
2. Analyze database requirements and determine the entities involved in the system and their relationship to one another.
3. Develop the logical design of the database using data modeling concepts such as entity-relationship diagrams.
4. Create a relational database using a relational database package.
5. Manipulate a database using SQL.

COURSE CONTENTS:

Introduction to database, Relational model: structure, relational algebra, SQL and advanced SQL, Database design and the entity-relationship model, Relational database design and normalization, application design and development, indexing, Database storage and file structure, transaction management, concurrency control recovery management, object database and database administration.

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

- Demonstrate an understanding of the relational data model.
- Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
- Formulate, using relational algebra, solutions to a broad range of query problems.
- Formulate, using SQL, solutions to a broad range of query and data update problems.

Institute of Information Technology (IIT), Jahangirnagar University

- Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.

Books Recommended:

1. Silberschatz A., Korth H.F. & Sudarshan S., "Database System Concepts", Tata McGraw Hill
2. Elmasri & Navathe, "Fundamentals of Database Systems", Addison Wesley
3. Ramakrishnan R. & Gehrke J., "Database Management Systems", McGraw Hill
4. O'neil P. & O'neil E., "Database Principles, Programming, And Performance", Harcourt Asia, Morgan Kaufman

PGDIT-201 : System Analysis and Design

COURSE OBJECTIVES:

Following this course students will be able to:

1. Gain comprehensive theoretical knowledge as well as practical skills related to the system development process.
2. Gather data to analyses and specify the requirements of a system.
3. Design system components and environments.
4. Build general and detailed models that assist programmers in implementing a system.
5. Design a database for storing data and a user interface for data input and output, as well as controls to protect the system and its data.

COURSE CONTENTS:

Different types of information systems, attributes of information, role, tasks and attributes of a system analyst, sources of information, information gathering techniques, handling of missing information, steps of system analysis, different types of feasibility analysis: Design of an information system process modeling, logic and timing modeling, conceptual data modeling: Project effort analysis method, designing user interfaces, database and file design, project team organization project management and documentation, system installation and commissioning, analysis of system maintenance and upgrading, Ethics, privacy control and security: Case study of an information system.

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Analyze a problem, and identify and define the computing requirements appropriate to its solution.
2. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
3. Communicate effectively with a range of audiences.
4. Use and apply current technical concepts and practices in the core information technologies.
5. Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.

Books Recommended:

1. Martin Fowler, Kendall Scott, "UML Distilled - Applying the standard object modeling language", Addison Wesley
2. Richard C Lee, William M Tepfenhart, "UML and C++ - A practical guide to object oriented development", PH
3. Grady Booch, "Object Oriented Analysis and Design with applications" II Edition Addison Wesley
4. James Martin & James J. Odell, "Object Oriented Methods - A foundation", Prentice Hall

PGDIT-202 : Object Oriented Programming

COURSE OBJECTIVES:

The objective of this course is to

1. Understand fundamentals of object-oriented programming in C++ and Java, including defining classes, invoking methods, using class libraries, etc.
2. Deal with important topics and principles of software development.
3. Have the ability to write a computer program in C++ to solve specified problems.

COURSE CONTENTS:

Features of Object Oriented Languages, Procedural vs. Object Oriented, Data Abstraction, encapsulation, inheritance, Polymorphism, Effects of OO Approach, Basic OO Design classes and encapsulation, constructors & destructors, Dynamic Memory Allocation, Pointers to Classes, I/O STREAM, overloading operators, constraints scope & linkage, inheritance polymorphism and dynamic binding class and function templates.

COURSE OUTCOMES:

Students will be able to:

1. Understand C++ based software code of medium-to-high complexity.
2. Understand the basic principles of creating applications with graphical user interface (GUI).
3. Apply the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation in object oriented programming.

Books Recommended:

1. The Complete Reference C++ : Herbert Schildt
2. Programming with C++ - John R Hubbard (Schaum's Outlines)
3. The C++ Programming Language – Bjarne Stroustrup
4. C++ Language Tutorial, Available at: <http://www.cplusplus.com/doc/tutorial/>

PGDIT-203 : Data Communication & Computer Networking

COURSE OBJECTIVES:

The objective of this course is to

1. Emphasize on the organization and management of local area networks (LANs).
2. Provide idea in computer network implementation, installation, monitoring, and troubleshooting. Introduce computer communication network initial design concepts.
3. provide bridges, routers and gateways; network naming and addressing knowledge.

COURSE CONTENTS:

Introduction to data communication and networks, transmission media, signals, noises, modulation and demodulation, synchronous and asynchronous transmission, line encoding, error detection and correction, RS 232 interface, HDLC, flow control and error control; Channel multiplexing, Network Topologies and protocols.

COURSE OUTCOMES:

On completion of the course students will be able to:

1. Familiar with various types of computer networks

Institute of Information Technology (IIT), Jahangirnagar University

2. Understand different layer communication protocols
3. Calculate digital transmission over different types of communication media.
4. Explain and solve mathematical problems for data-link and network protocols.
5. Perform IP addressing and Routing protocol calculations.

Books Recommended:

1. Data Communications & Networking– Behrouz A Forouzan
2. Data and Computer Communication – William Stallings
3. Computer Network –Tannenbaum
4. Computer Networking- A top down Approach – Kurose and Ross

PGDIT-301 : Web Programming

COURSE OBJECTIVES:

The objective of this course is to

1. Provide the basics understanding and publishing content on the World Wide Web.
2. Help to develop the ‘language of the Web’ – HTML, XML the fundamentals of how the Internet and the Web function.
3. Discuss the general introduction about PHP, Cascading Style Sheets, and JavaScript where students are able use these programs to design client side and server side scripting.

COURSE CONTENTS:

Web architecture and HTTP history and architecture of the World Wide Web, overview of the Hyper Text Transfer Protocol, other related protocols, Hyper Text Mark Language (HTML): concept of markup, overview of HTML (table, form, frame, window, link etc.): Client side scripting; variable data types, control structure, functions, Document Object Model (DOC), event handlers, properties methods, cookies; Server side scripting concepts, variables, data types, control structure, functions objects; Database content generation, data exchange; Regular expressions, mails, cookies, sessions, Middleware object (trading, naming, event, transaction, security). Interorb protocols (e.g the Internet Interorb protocol.)

COURSE OUTCOMES:

On completion of the course students will be able to

1. Analyze a web page and identify its elements and attributes.
2. Describe the components of the Internet and Web technology.
3. Explain the basics of Internet technology, such as http and the World Wide Web, HTML.
4. Create WWW pages to serve as front-end to client/server, Internet applications.

Books Recommended:

1. A. Berson: Client/Server Architecture, 2 nd ed., McGraw-Hill Series on Computer Communication.
2. Chris Bates: Web Programming. Building Internet Applications, 2 nd ed., John Wiley & Sons, Ltd., 2002.
3. Douglas E. Comer: Computer Networks and Internets with Internet Applications, 3 rd ed., Prentice Hall International, Inc., 2001.

Institute of Information Technology (IIT), Jahangirnagar University

PGDIT-300 : Project Work

Project Work will be of 6 credit hour. However, project proposal will be submitted and presented at the end of 3rd trimester.

The project will be supervised by a faculty member or representative from other dept/institute/industry.

Detailed Course Outline

FOR

POST GRADUATE DIPLOMA IN INFORMATION TECHNOLOGY (PGDIT)

Opional Courses

PGDIT-211 : Telecommunication Fundamentals

COURSE OBJECTIVES:

The objective of this course is to :

1. Gain the basic telecommunication knowledge
2. Ubderstand the basic communication systems : Modulation, Multiplexing, VOIP etc
3. Familiar with Mobile systems, Cellular telephony, Frequency Management.

COURSE CONTENTS:

Overview of telecommunication: history evolution, convergence of telecommunication and data networks standards; Basics of communication systems,; modulation; multiplexing; switching system circuit switching, packet switching, Voice over internet Protocol (Volp), Fax over IP network, voice over frame relay, and ATM, Telephony; operating principles, telephone apparatus, description of the modern phone; Telephone switching systems: PBX, Centrex, ACDs, call centers, computer integration. Data communication equipment: introduction to terminals, moderns, RS-232 and other interfaces, modern types; Tele-Traffic analysis; Cellular telephony; Frequency reuse, frequency management, channel alignment, handoffs strategies, FDMA, TDMA, DCMA and GSM, Introduction to satellite communication, Optical fiber communication, Submarine cable, Digital Radio Microwave, etc.

COURSE OUTCOMES:

On completion of the course students will be able to:

1. Understand the basic telecommunication fundamentas knowledge
2. Understand the basic communication systems : Modulation, Multiplexing, VOIP, ATM, Switching, Traffic analysis etc
3. Apply the knowledge Mobile systems, Cellular telephony, Handoff , and Frequency Management Techniques.

Books Recommended:

1. data communication and networking by Forouzan, McGraw Hill
2. Data and Computer Communication by W Stalling, Pearson

PGDIT-212 : Cloud Computing Basics

COURSE OBJECTIVES:

The objective of this course is to :

1. Get the basic idea of Distributed Computing
2. Learn the concept of Cloud computing including Data center, Virtualization , Security concepts
3. Familiar wth cloud service provisioning, Green cloud computing

COURSE CONTENTS:

History of Centralized and Distributed Computing, Cloud Computing principles and Virtualization, Types of Cloud Services and overview of some selected system: VCL, Eucalyptus, EC2, Other clouds, including commercial clouds; Cloud resource: Network and API, Virtual and bare-metal computational resources, Data-storage, cloud Interfaces: Cloud Access: authentication, authorization and accounting; Cloud Provenance and meta-data: cloud Reliability and fault tolerance; Cloud Security, privacy, policy and compliance; Cloud, Cloud federation, interoperability and standards; Cloud Economics; Advanced topics; HPC in the Cloud, Cloud brokering.

COURSE OUTCOMES:

On completion of the course students will be able to:

1. Understand the cloud computing basics.
2. Learn the SLA, Data center concepts and security aspects in cloud computing.
3. Familiar with Green cloud and cloud brokerage systems.

Books Recommended:

1. Mobile Communications, 2/e, Jochen Schiller, PEA, 2008.
2. Mobile and Wireless Design Essentials, Martyn Mallick, Wiley, 2008.
3. Mobile Computing, Asoke K Talukder, et al., MGH, 2008.
4. Handbook of Cloud Computing, First Edition, 2010, Springer. 2. Advanced Database Technology and Design (Artech House Computer Library), Author: Mario Piattini.

PGDIT-213 : Microcontroller & Embedded Systems

COURSE OBJECTIVES:

The objective of this course is to :

1. Provide an overview of interfaces, interrupts and microcontroller.
2. Describe basic interfacing between analog and digital blocks.
3. Provide the design consideration trade off and Network embedded systems.

COURSE CONTENTS:

Concepts, classifications; Characteristics; Requirements (UML); Embedded micro-controller cores; Embedded memories; Technological aspects; Interfacing between analog and digital blocks; Signal conditioning, digital signal processing, sub-system interfacing: Interfacing with external systems, user interfacing, Design trade-offs, thermal considerations; Networked embedded systems the 12C bus, the CAN bus, the FlexRay: Example of applications.

COURSE OUTCOMES:

On completion of the course students will be able to:

1. Understand the interfaces, interrupts and microcontroller basics.
2. Familiar with interfacing between analog and digital blocks.
3. Design idea and understand of Network embedded systems.

Books Recommended:

1. G. Buttazzo: Hard Real-Time Computing Systems. 2nd edition, Springer, 2005.
2. P. Eles, K. Kuchcinski, Z. Peng: System Synthesis with VHDL. Kluwer Academic Publishers, 1998.
3. P. Marwedel: Embedded Systems Design. Springer, 2006

PGDIT-214 : E-Commerce

COURSE OBJECTIVES:

The objective of this course is to :

1. Learn basics of E-commerce .
2. Overall idea of e-marketplaces including auctions and portals;
3. Learn online marketing and consumer behavior, e-commerce ethics, e-government; e-learning; social networks; e-commerce security; payment solutions

COURSE CONTENTS:

Overview of electronic commerce, business models; E-commerce channels; portals, auctions, communities, marketplace; Managing the marketplace; Demographics and advertising; Customer relationship management, web services for B2B and B2C e-commerce, electronic payment systems; Network security, cryptography, digital certificates; Markup for e-commerce; ebXML, M-commerce, L-commerce, wireless and U-commerce, digital money and electronic banking; Ethical, legal and regulatory environment; Intellectual property, copyright, trademark, patents.

COURSE OUTCOMES:

On completion of the course students will be able to:

1. Understand the concept of E-commerce and business models
2. Identify different e-commerce platforms and Channels
3. Understand e-marketing and advertising concepts
4. Understand e-commerce payment systems

Books Recommended:

1. E-Commerce Services and Application: A Practical Guide by Lee Sai Peck, Mohammad Zahidur Rahman.
2. E-Commerce by Smith R, Speaker M, & Thompson M (Prentice Hall, India)
3. Designing Systems for Internet Commerce by Trease GW & Stewart LC
4. Cryptography and Network Security- Behrouz A Forouzan

PGDIT-311 : Mobile Application

COURSE OBJECTIVES:

Following this course students will be able to:

1. Describe those aspects of mobile programming that make it unique from programming for other platforms,
2. Critique mobile applications on their design pros and cons,
3. Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces,
4. Program mobile applications for the Android operating system that use basic and advanced phone features, and
5. Deploy applications to the Android marketplace for distribution.

COURSE CONTENTS:

Mobile computing, Android Development Environment, Factors in Developing Mobile Applications Mobile Software Engineering, Frameworks and Tools Generic UI Development Android User. VUIs and Mobile Apps Text-to-Speech Techniques, Intents and Services android Intents and Services, Characteristics of Mobile Applications, Successful Mobile Development, Storing and Retrieving Data,

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Synchronization and Replication of Mobile Data, getting the Model Right, Android Storing and Retrieving Data.

Android Network and Web, Telephony: Deciding Scope of an App. Wireless Connectivity and Mobile Apps, Android Telephony, Notifications and Alarms, Performance, Performance and Memory Management, Android Notifications and Alarms, Graphics; Android Graphics, Multimedia; Mobility and Location Based Service, Field Service App, Security and hacking; Active Transactions, hacking Android.

COURSE OUTCOMES:

A student passing this module should be able to:

1. Design scripts to meet given interface and media control requirements;
2. Use variables, properties and other code elements appropriately to implement the code design;
3. Devise, carry out and evaluate functional test strategies of mobile design;
4. Implement and evaluate techniques for the installation of mobile applications and delivery via various channels;
5. Explain the principles of technologies which support media production and delivery on a variety of platforms.

Books Recommended:

1. The Design of Everyday Things, Norman, Basic Books, 2002
2. Beginning iPhone 3 Development: Exploring the iPhone SDK by Jeff LaMarche, and David Mark, Apress, July 21, 2009, 978-1430224594.
3. iPhone SDK Development, by Bill Dudney & Chris Adamson

PGDIT-312: Software Engineering

COURSE OBJECTIVES:

The program will prepare our students to

1. Be successful professionals in the field with solid fundamental knowledge of software engineering.
2. Utilize and exhibit strong communication and interpersonal skills, as well as professional and ethical principles when functioning as members and leaders of multi-disciplinary teams
3. Apply their foundations in software engineering to adapt to readily changing environments using the appropriate theory, principles and processes

COURSE CONTENTS:

Software engineering paradigms, process models, complexity models, requirement engineering, different models of effort, schedule-and cost-estimation, risk analysis and management, project management, different software design methodologies, verification and validation, testing philosophy and methods, software configuration management, software metrics, software reliability and availability, software maintenance and software re-engineering, development of application using software engineering concepts.

COURSE OUTCOMES:

At the time of graduation, all Software Engineering students will have demonstrated:

1. How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
2. An ability to work in one or more significant application domains

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3. Work as an individual and as part of a multidisciplinary team to develop and deliver quality software
4. Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle
5. Demonstrate an ability to use the techniques and tools necessary for engineering practice

Books Recommended:

1. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli; Fundamentals of Software Engineering; 2nd edition; Pearson Education Asia
2. Pressman R.S.; Software engineering - A practitioner's approach; 5th edition; McGraw Hill Higher education series
3. Mall R.; Fundamentals of Software Engineering; Prentice Hall of India
4. Ian Sommerville; Software Engineering, Pearson Education Asia

PGDIT-313 : DOT Net Technology

COURSE OBJECTIVES:

The program will prepare our students to :

1. Understand the basics of DOT Net Technology.
2. Familiar with C#, VB net and ASP net
3. Concepts of building web applications

Course Contents:

C# Getting Started with Net Framework, Exploring Visual Studio, NET, Inside a C# Program, Data Types, Statements, Arrays, Using Strings, Objects, Classes and Structs, Properties, Inheritance, Handling, Threading, Using Streams and Files, Reflection, Assemblies, versioning, Windows, Forms, Controls, Data binding to Controls, Advanced Database Programming using ADO net, Using GDL + Networking, net Removing, Manipulating XML.

VB net

Creating Applications with Visual Basic NET, Variables, Constants, and Calculations, Making Decisions and Working with String, Lists, Loops, Validation, Sub Procedures and Functions, Multiple Forms, Standard Modules, and Menus, Arrays, Timers, Form Controls, File Handling, Exception Handling, Working with Databases, Advanced Database Programming using ADO net, Classes, Generics, Collections, Inheritance, Custom Controls, Packaging & deployment, Using Crystal Reports.

ASP net

Building a web Application, Examples Using Standard Controls, Using HTML, Controls, Validating Form Input Controls using Validation, Controls, Understanding Applications and State, Applying Styles, Themes, and Skins, Creating a Layout Using Master Pages, Binding to Databases using Controls. Data Management with ADO net, Creating a Site Navigation Hierarchy, Navigation -----

COURSE OUTCOMES:

At the time of graduation, students will have demonstrated:

1. Capable of basic understanding of DOT Net Technology.
2. Able to compare and Familiar with C#, VB net and ASP net
3. Implement the Concepts of building web applications

Books Recommended:

1. ASP.NET 3.5 Unleashed, by Stephen Walther SAMS Publishing, ISBN 0-672-33011-3
2. Microsoft ASP.NET and AJAX: Architecting Web Applications, by Dino Esposito Microsoft Press, ISBN 978-0-7356-2621-8
3. ASP.NET MVC Framework Unleashed, by Stephen Walther SAMS Publications, ISBN 978-0672329982
.NET 4.5 Programming 6-in-1, Black Book” by Kogent Learning Solutions Inc

PGDIT-314 : Artificial Intelligence and Neural Network

COURSE OBJECTIVES:

The program will prepare our students to :

1. Provide the idea and overview of artificial intelligence (AI) principles and approaches.
2. Familiar with the basic understanding of the building blocks of AI: Search, Knowledge representation, inference, logic, and learning.

Course Contents:

Introduction –Problems-Problem Spaces And Search-Heuristic Search Techniques-Knowledge Representation Issues-Representing Knowledge Using Rules-Symbolic reasoning Under Uncertainty, Statistical Reasoning-Weak And Strong Slot-Filler Structures –Game Playing-Planning, Understanding-Natural Language Processing-Parallels And Distributed, knowledge Based information Processing, Neural-Neural Information Processing-Hybrid Intelligence, Basic Neuron Model-Network Properties-Node Properties-System Dynamics-Inference & Learning Classification Model-Association Model-Optimization Model-Self Organizing Models, Learning-Definition- Supervised & Unsupervised Learning-Statistical Learning-neural Network Learning, Back Propagation-Generalization-Radial Basis Function-Reinforcement Learning-Temporal Difference-Art, Knowledge Based Neural Networks-Rule Based Neural Networks-Network Training-Network Revision-Example Of Theory Revision-Decision Tree Based Neural Networks –Constrained Based Neural Networks-Incremental Learning, Neural Programming based on Matlab.

COURSE OUTCOMES:

At the time of graduation, students will have demonstrated:

1. Understanding of artificial intelligence (AI) principles and approaches.
2. Knowledge of the building blocks of AI: Search, Knowledge representation, inference, logic, and learning.

Books Recommended:

1. Intelligence, 3/e, E.Rich, K.Knight, TMH.
2. Introduction to Fuzzy Systems, G Chen, Trung Tat Pham, Chapman & Hall/CRC, 2009.
3. Artificial Intelligence, A Modern Approach, 2/e, Stuart Russel, Peter Norvig, PHI/PEA.

PGDIT-315 : Network Security

COURSE OBJECTIVES:

The program will prepare our students to :

1. Acquire the fundamentals idea of Network Security.
2. Understand the knowledge on standard algorithms used to provide confidentiality, integrity and authenticity.
3. Familiar with various key distribution and management schemes.
4. Learn the encryption techniques to secure data in transit across data networks.

Course Contents:

Introduction to Computer Security, Basic Cryptography, Data privacy, Physical Layer Security, *Physical Network Security*-Copper Media and Optical Media, Wireless Media: Intro to Cellular Networks, Satellite Communications *Data Center and Enterprise Network Security; Overview of Ethernet, Spanning tree, protocol, VLANs QinQ, DHCP, DTP/VTP, Power over Ethemet, HSRP/VRRP, ACLs, firewalls, middleboxes* LAN Security mechanism and attach, Router Mechanisms for Security Router and Switch Architectures: Matching algorithms, Classification algorithms, Scheduling algorithms, Intrusion detection system and pattern matching algorithms. Defensive Configuration: *Internet Policy Routing*: BGP Routing Policies in ISP Networks, Securing Distributed Algorithms, Designing robust network topologies. Internet security architectures and Security of networked systems: QoS and Multicast, Web and DNS security: Network Security with OpenSSL, Wireless Security, Quantum Cryptography/Communication, Security of Internet Architectures, Secure Multiparty Computation, Resilient Network topologies, Anomaly Detection and Traffic Analysis, Operational Network Security, Data Mining for Intrusion Detection, Network Traffic Anomaly Detection, Intrusion Detection Algorithms.

COURSE OUTCOMES:

At the time of graduation, students will have demonstrated:

1. Identify the vulnerabilities in computing system and able to design a security solution.
2. Analyze the security issues in the network and resolve it.
3. Understand and Evaluate different security mechanisms.

Books Recommended:

1. Applied Cryptography, 7/e, Bruce SCHNEIER John Wiley & Sons Inc.
2. Cryptography and Network Security, William Stallings, PHI.
3. Introduction to cryptography with coding Theory, 7/e, Wade Trappe, C. Washington, PEA.
4. Cryptography and Network Security- Behrouz A Forouzan