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

Institute of Information Technology (IIT)
Jahangirnagar University

Institute of Information Technology (IIT)

Jahangirnagar University (IIT-JU)

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 (PMIT) 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:

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

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 x 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 the 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 be running on Fridays/ Saturdays.

2. No. of Enrollment in Each Batch

The total number of seats for the PGDIT program is 40. However, the academic committee of IIT have rights to increase the number of seats and male/female ratio based on the available facilities and resources

3. Eligibility for Admission

Applicants willing to get admitted into the PGDIT program must satisfy the following requirements:

Minimum 3 years graduation in any discipline with minimum CGPA of 2.5 on the scale of 4 or equivalent, and minimum 3.00 on the scale of 5 in the HSC and SSC or equivalent.

4. Admission Procedure

4.1. Regular Admission.

Admission test will be held in two phases to enroll in PGDIT program:

i) An one-hour admission test will be held based on basics in IT, Mathematics and English language proficiency.
ii) Selected candidates will have to appear on a viva-voce with all original certificates at the time of admission for final selection. However, no marks are allocated for this viva-voce.

Application form is available on the website (pgdit.iitju.edu.bd) or office of the IIT, JU. Some important points regarding written test are as follows:

a) All questions will be in English.
b) Questions will be multiple choice type (preferable) and/or written type.
c) Total time will be 60 minutes and total marks will be 60.
d) Need to answer in OMR sheet with black ball point pen.

4.2. Re-Admission.

Re-admission will be valid for a maximum 6 trimesters from the admission of one's regular admission. In addition, re-admission fee will be decided according to the financial and management rules of PGDIT, JU.

5. Admission Schedule

Admission schedule will be declared before call for admission for specific session: three times in a year for-

i) Spring (January-April)
ii) Summer (May-August)
iii) Fall (September-December)

6. Program Structure and Duration

The PGDIT program is a one-year program consisting of three trimesters; each has a 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**

7. Course Structure (10 × 3 = 30 + 6 = 36 Credits)

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

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		Theory Courses	Project Work	Total Credit
	Trimester I	04	-	4 × 3 = 12
	Trimester II	04	-	4 × 3 = 12
	Trimester III	02	6 Credits	(2×3) + 6 = 12
			Total Credit	**= 36**

8. Distribution of Courses

There is a list of courses. Each students will have to take following number of courses in the given trimester

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

- **First Trimester:** Four Courses (4 × 3 = 12 credit-hours)
- **Second Trimester:** Four Course (4 × 3 = 12 credit-hours)
- **Third Trimester:** Two Courses 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, the project proposal will be submitted and presented at the end of the 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.

Theory Courses

PGDIT-101	Introduction to IT and 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-105	Computer Programming Environment	3.0
PGDIT-106	Object Oriented Programming	3.0
PGDIT-107	Network Design	3.0

PGDIT-108	Web Programming	3.0
PGDIT-109	Software Engineering	3.0
PGDIT-110	E-Commerce	3.0
PGDIT-111	Cloud Computing and its Application	3.0
PGDIT-112	Mobile Application	3.0
PGDIT-113	Wireless Communication Fundamentals	3.0
PGDIT-114	Artificial Intelligence and Neural Network	3.0
PGDIT-115	Network Security	3.0
PGDIT-116	Microcontroller & Embedded Systems	3.0
PGDIT-117	Cyber Security & Ethics	3.0
PGDIT-118	Health Informatics	3.0
PGDIT-119	Sensor and Interfacing	3.0
PGDIT-120	.NET Technology	3.0
PGDIT-121	Software Testing and Quality Assurance	3.0
PGDIT-122	Management Information System	3.0
PGDIT-123	Telecommunication Network Management	3.0
PGDIT-124	Project Management and Quality Assurance	3.0
PGDIT-125	Recent Trends in ICT	3.0
PGDIT-126	Projects	6.0

9. 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%
Class Test/Tutorial/Quiz	20%
Project/Lab/Assignment	20%
Final Exam.	50%
Total Marks	100%

The continuous assessment may consist of Class test/Tutoral/Quiz (20%). In addition, more 20% is defined for Project/Lab/Assignment. Moreover, 10% is evaluated for attendance. Therefore, rest of the 50% will be evaluated through Final Examination. 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.

10. 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
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		
Regular grade	**A-I**		**For Projects**

11. 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. A fee must be paid as per the financial ordinance.

12. Degree Completion Requirement

The requirements for awarding PGDIT degree are:

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

13. Miscellaneous

- Enrollment to PGDIT program is valid for 3 years after the date of admission.
- 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.
- 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 a separate transport facility provided by the PGDIT Coordination Committee.
- Detailed academic calendar for the specific session will be provided before call for admission of the specific session. Generally PGDIT program starts from January 01 and result will be published on December 31.
- Application for admission implies agreeing to abide by the rules and regulations of the IIT and as well as Jahangirnagar University.

- The IIT academic committee 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:

- Learn the concepts of computer & programming fundamentals
- Describe the IT fundamentals and its applications.
- 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 anthmetic, 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).

COURSE OUTCOMES:
After completing this course students will be able to:

- 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
- Design programs connecting decision structures, loops and functions.
- Get the concepts of e-commerce, information security, multimedia and Management Information System (MIS).

Books Recommended:

1. Introduction to Information Technology, Pearson Education, ITL 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: Computer Programming Environment

COURSE OBJECTIVES.
The objectives of this course are to:

- Learn fundamental knowledge on basics of computers, hardware, software, and number systems
- Familiarize about the basic terminologies used in computer programming

- Proficiently transform designs of problem solutions into a standard programming language
- Use an integrated development environment (IDE) to write, compile, and execute programs involving a small number of source files
- Proficiently use fundamental programming elements including: variable declaration, data types and simple data structures (arrays, strings, and structures), decision structures, loop structures, functions/methods, input and output for console and text files
- Apply debugging and testing techniques to locate and resolve errors and to determine the effectiveness of a program,
- Have understanding of professionalism, codes of ethics and responsible conduct

COURSE CONTENTS.

History of Programming Languages; Programming Environment; Complier and Interpreter; Structural Programming concepts: Programming fundamentals, data types, operators, expressions, control structures; Functions and program structure, Header files; Preprocessor; Pointers and arrays; Strings, multidimensional array, User defined data types; Input and Output, file access; Variable length argument list; Command line parameters; Error Handling; Graphics, Linking, library functions.

COURSE OUTCOME.

- Use the fundamentals ofC programming in trivial problem solving
- Enhance skill on problem solving by constructing algorithms
- Identify solution to a problem and apply control structures and user defined functions for solving the problem
- Demonstrate the use of Strings and string handling functions
- Apply skill of identifying appropriate programming constructs for problem solving

Books Recommended:

1. Programming with C- Byron Gottfried (Schaum's Outline Series)
2. Herbert Schidt, "C Made Easy", McGraw Hill.
3. How to Program- Deitel / Deitel, C (Prentice Hall)
4. Problem solving and Progamming- Barclay, ANSI C (Prentice Hall)
5. Progamming in ANSI C- E Balagurusamy

PGDIT-103: 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:

- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms.
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs.
- Compare and contrast the benefits of dynamic and static data structures implementations.
- Describe the concept of recursion, give examples of its use, and describe how it can be implemented. .
- 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:

- List and explain the fundamental concepts of a relational database system.
- Analyze database requirements and determine the entities involved in the system and their relationship to one another.
- Develop the logical design of the database using data modeling concepts such as entity-relationship diagrams.
- Create a relational database using a relational database package.
- 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.
- 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-105: Operating System Concepts

COURSE OBJECTIVES*:*
The objective of this course is to

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

COURSE CONTENTS:
Operating System: its role in computer systems; Operating system concepts; Operating system structure; Process: process model and implementation, Inter-Process Communication (IPC), classical IPC problems, process scheduling, multiprocessing and time-sharing; Memory management: swapping, paging, segmentation, virtual memory; Input/Output: hardware, software, disk, terminals, clocks; Deadlock: resource allocation and deadlock, deadlock detection, prevention and recovery; File Systems: files, directories, security, protection; Case study of some operating systems.

COURSE OUTCOMES:
On completion of the course students will be able to

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

Books Recommended:

- Silberschatz, Galvin, Gagne—Operating System Concepts, John Wiley & Songs, Inc.
- Andrew S. Tanenbaum, Albert S. Woodhull, OS: Design and Implementation, Prentice-Hall India.
- Nutt G. J., Operating Systems-A Modern Perspective, Pearson Education Asia

PGDIT-106: Object Oriented Programming

COURSE OBJECTIVES:
The objective of this course is to

- Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- Be aware of the important topics and principles of software development.
- Have the ability to write a computer program to solve specified problems.
- Be able to use the Java SDK environment to create, debug and run simple Java programs
- To build themselves as a professional developer in Java.

COURSE CONTENTS:
Introduction to Java: History of Java, Java Class Libraries, Introduction to Java Programming, A simple Program. Developing Java Application: Introduction, Algorithms, Pseudo code, Control Structure, The If /Else Selection Structure, The While Repetition Structure, Assignment Operators, Increment and Decrement Operators, Primitive Data Types, Common Escape Sequence, Logical Operator Control Structure: Introduction, The For Structure, The Switch Structure, The Do/While Structure, The Break and Continue Structure. Methods: Introduction, Program Module in Java, Math Class Methods, Method Definitions, Java API Packages, Automatic Variables, Recursion, Method Overloading, Method of the Applet Class. Arrays : Introduction, Arrays, Declaring and Allocating Arrays, Passing Arrays to Methods, Sorting Arrays, Searching Arrays, Multiple-Subscripted Arrays Object-Based Programming: Introduction, Implementing a Time Abstract Data Type with a Class, Class Scope, Controlling Access to Members, Utility Methods, Constructors, Using Overload Constructor, Using Set and Get Method, Software Reusability, Friendly Members, Finalizers, Static Class Members, Data Abstraction and Information Hiding Object-Oriented Programming: Introduction, Superclasses and Subclasses, Protected Members, Using Constructor and Finalizers in Subclasses, Composition vs. Inheritance, Introduction to polymorphism, Dynamic method building, Final Methods and Classes, Abstract Superclasses and Concrete Classes. String and Characters, Graphics, Exception Handling, Files and Stream, Java API, Utility Classes, 2D Graphics, GUI, Swing, Events.

COURSE OUTCOMES:
Students will be able to:

- Read and understand Java-based software code of medium-to-high complexity.
- Use standard and third party Java's API's when writing applications.
- Understand the basic principles of creating Java applications with graphical user interface (GUI).
- Create rich user-interface applications using modern API's such as JAVAFX.
- Understand the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation.
- Understand the basic approaches to the design of software applications.

- Apply the above to design, implement, appropriately document and test a Java application of medium complexity, consisting of multiple classes.

Books Recommended:

- Java The Complete Reference: Herbert Schildt, 9th edition
- The Java Programming Language – Ken Arnold, James Gosling, David Holmes
- JAVA How To Program (10th Edition), by Deitel and Deitel, Prentice/Hall International.
- Java, Java, Java™: Object-Oriented Problem Solving (3rd edition), by Ralph Morelli, Ralph Walde, Prentice Hall.

PGDIT-107: Network Design

COURSE OBJECTIVES:
The objective of this course is to:

- Emphasize on the organization and management of local area networks (LANs).
- Provide idea in computer network implementation, installation, monitoring, and troubleshooting
- Introduce computer communication network initial design concepts.
- 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:

- Familiar with various types of computer networks
- Understand different layer communication protocols
- Calculate digital transmission over different types of communication media.
- Explain and solve mathematical problems for data-link and network protocols.
- 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-108: Web Programming

COURSE OBJECTIVES:

The objective of this course is to

- Provide the basics understanding and publishing content on the World Wide Web.
- Help to develop the 'language of the Web' – HTML, XML the fundamentals of how the Internet and the Web function.
- 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

- Analyze a web page and identify its elements and attributes.
- Describe the components of the Internet and Web technology.
- Explain the basics of Internet technology, such as http and the World Wide Web, HTML.
- 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.

PGDIT-109: Software Engineering

COURSE OBJECTIVES:
On completion of the course students will be able to

- learn basic SW engineering methods and practices, selected models.
- Understand Role of project management including planning, scheduling and, risk management, verification and validation techniques
- Analyze quality control that will enable the students to apply these in subsequent projects and work experiences

COURSE CONTENTS:
Software engineering principles, life cycle models, sizing, estimation, planning, and control, requirements specifications, functional specification and design, integration and testing strategies, quality assurance, configuration management, software maintenance. Management of programming

teams, programming methodologies, debugging aids, documentation and measurement of software verification and testing techniques and the problems of maintenance, modification and portability. Introduction to object oriented software engineering.

COURSE OUTCOMES:
On completion of the course students will be able to:

- Develop, maintain and evaluate large-scale software systems
- Produce efficient, reliable, robust and cost-effective software solutions
- Manage time, processes and resources effectively by prioritizing competing demands
- Work as an effective member or leader of software engineering teams

Books Recommended:

- Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli; Fundamentals of Software Engineering; 2nd edition; Pearson Education Asia
- Pressman R.S.; Software engineering - A practitioner's approach; 5th edition; McGraw Hill Higher education series.
- Mall R.; Fundamentals of Software Engineering; Prentice Hall of India
- Behferooz A. &Gydsib F.J.; Software Engineering fundamentals; Oxford University Press.
- Jalote P.; An Integrated approach to Software Engineering; Narosa
- Ian Sommervillie; Software Engineering, Pearson Education Asia

PGDIT-110: E-Commerce

COURSE OBJECTIVES:
The objective of this course is to :

- Learn basics of E-commerce .
- Overall idea of e-marketplaces including auctions and portals;
- 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:

- Understand the concept of E-commerce and business models
- Identify different e-commerce platforms and Channels

- Understand e-marketing and advertising concepts
- 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-111 : Cloud Computing and Its Applications

COURSE OBJECTIVES:
The objective of this course is to :

- Get the basic idea of Distributed Computing
- Learn the concept of Cloud computing including Data center, Virtualization , Security concepts
- 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 meto-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:

- Understand the cloud computing basics.
- Leran the SLA, Data center concepts and security aspects in cloud cfomputing.
- 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-112: Mobile Applications

COURSE OBJECTIVES:
Following this course students will be able to:

- Describe those aspects of mobile programming that make it unique from programming for other platforms,
- Critique mobile applications on their design pros and cons,
- Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces,
- Program mobile applications for the Android operating system that use basic and advanced phone features, and
- 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 Ul Development Android User. VUls 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, 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:

- Design scripts to meet given interface and media control requirements;
- Use variables, properties and other code elements appropriately to implement the code design;
- Devise, carry out and evaluate functional test strategies of mobile design;
- Implement and evaluate techniques for the installation of mobile applications and delivery via various channels;
- 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-113: Wireless Communication Fundamentals

Course Objectives:

The objective of this course is to

- Build an understanding of the fundamental concepts of cellular network..

- Familiarize the student with the basic taxonomy and terminology of the wireless networking.
- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- Gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

COURSE CONTENTS:

Cellular concepts: frequency reuse, handoff strategies, interference and system capacity, grade of service, improving capacity and coverage, call blocking probability; Propagation effects: outdoor propagation models, indoor propagation models, power control, Doppler effect, small and large scale fades; Wireless LAN Technology; IEEE 802.11: standard, protocol architecture, physical layer and media access control; Mobile IP; Wireless Application Protocol; IEEE 802.16 Broadband Wireless Access; Brief review of 2nd and 3rd generation wireless: GSM, GPRS, CDMA; Cordless system; Wireless local loop; Bluetooth, WSN, Emerging Wireless Networks.

COURSE OUTCOMES:

On completion of the course students will be able to

- Independently understand the operation of a cellular network.
- Understand designing and optimization of cellular network.
- Identify the different types of network topologies and protocols.
- Understand the operation of protocols of various types of wireless network standards

Books Recommended:

- Wireless Communication and Networks by William Stallings.
- Wireless and Mobile Network Architecture by Yi-Bing Lin and Imrich chlamtac
- Wireless Communications by Andrea Goldsmith
- Wireless Communications: Principles & Practice-- Rapaport

PGDIT-114: Artificial Intelligence and Neural Networks

COURSE OBJECTIVES:

The program will prepare our students to:

- Provide the idea and overview of artificial intelligence (AI) principles and approaches.
- 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:

- Understanding of artificial intelligence (AI) principles and approaches.
- 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.

PGDIT115: Network Security

COURSE OBJECTIVES:
The program will prepare our students to :

- Aacquire the fundamentals idea of Network Security.
- Understand the knowledge on standard algorithms used to provide confidentiality, integrity and authenticity.
- Familiar with various key distribution and management schemes.
- 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:

- Identify the vulnerabilities in computing system and able to design a security solution.
- Analyze the security issues in the network and resolve it.
- 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

PGDIT116: Microcontroller & Embedded Systems

COURSE OBJECTIVES:
The objective of this course is to :

- Provide an overview of interfaces, interrupts and microcontroller.
- Describe basic interfacing between analog and digital blocks.
- 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:

- Understand the interfaces, interrupts and microcontroller basics.
- Familiar with interfacing between analog and digital blocks.
- Deesign 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

PGDIT117: Cyber Security & Ethics

COURSE OBJECTIVE:
Having completed this course the student will be able:

- To provide an understanding of principal concepts, major issues, technologies and basic approaches in information security.

- To gain the basic principles of Cyber Security and to know how it affects our daily life.
- To gain an understanding of terms and terminology commonly used in Cyber Security.
- To know how vulnerabilities occur and how to limit them.
- To gain a fundamental understanding of what an attack/threats is, and how to identify and prevent them from occurring.
- To gather skills and understanding needed to manage risks and recover disasters.
- To develop an understanding of cyber security ethics, policies as well as protocols to implement such policies.

COURSE CONTENTS:
Principles of cyber security, Interrelated components of the computing environment, Cyber security models (the CIA triad, the star model, the Parkerianhexad), Cyber vulnerabilities, and consequences, Cyber threats-types of attacker, Motives-what drives an attacker, Means, Cyber attack, Methods, Types of cyber attack& attack vectors, Risks of conducting a cyber-attack. Cybercrime, Cyber harassment, Cyber warfare, Cyber surveillance, Issues making cyber security difficult, State of security today. Principles of risk, Types of risk, Risk strategies, Risk Management Framework (RMF), Disaster recovery plan and procedures, Challenges of disaster recovery plan, traditional disaster recovery. Digital Security Act, National ICT Act & Policy, National Information security policy guideline, government and private sector role's in securing cyberspace, International laws in securing cyberspace. Cyber Ethics Vs. Cyber Law, Ethical issues in cyberspace for safety and security, Acceptable User Policy (AUP) and Netiquette

COURSE OUTCOMES:
Upon completion of this course, graduates will be able to:

- Possess a fundamental knowledge of Cyber Security
- Understand what a vulnerability is and how to address most common vulnerabilities
- Know basic and fundamental risk management principles as it relates to Cyber Security
- Have the knowledge needed to practice safer computing and safeguard your information
- Investigate emerging security trends and their application to professional practice;
- Apply skills in the identification of security threats, implementation of secure system properties, security testing, and incident response;
- Critically evaluate and reflect on ethical issues that relate to the IT discipline;

Books Recommended:

1. Information Security: The Complete Reference (2nd Edition)- Mark Rhodes-Ousley.
2. Information Security Management: Concepts and Practice (New York, McGraw-Hill, 2013).
3. Cyber Security and Cyber War: What Everyone Needs to Know (1st Edition, ISBN-13: 978-0199918119)- P.W. Singer, Allan Friedman.
4. Cyber Security Basics: Protect Your Organization by Applying the Fundamentals (1st Edition)- Don Franke.

PGDIT118: Health Informatics

Course Objectives:

The objective of this course is to

- develop the students' ability to independently integrate and use knowledge of health
- develop the students' ability to deal with complex phenomena, issues and situations for health
- develop the students' potential for professional activities that demand considerable independence or for research and development work.

Course contents.

HealthCare Information Systems: Health Care Information Systems, Strategic Planning, Selecting a Health Care Information System, System Implementation and Maintenance, Information Systems Training, Information Security and Confidentiality, System Integration, and Interoperability, The Electronic Health Record, Regulatory and Accreditation Issues, Foundations of Healthcare Informatics: Major Theories Supporting Health Care Informatics (System Theory), Computer, Information Health Care Informatics Literacy, Supporting Administrative Decision Making, Supporting Clinical Decision Making. System Analysis/System Planning: System Planning, Applications for HealthCare Information Systems, Strategic and Tactical Planning for Health Care Information Systems, Work Flow Analysis, The Impact of Informatics on the Socio-cultural Environment of Health Care/Work Systems: The Impact of HealthCare Informatics on the Organization, The Implications of Information Technology for Research, Using Technology To deliver Health Care Education: Technological Approaches to Communication, Technology and Distributed Education.

Books Recommended:

- Sheila P. Englebardt, Ramona Nelson, Ramona Nelson. Health Care Informatics: An Interdisciplinary Approach. Mosby, Nov 2001, ISBN: 0323014232.
- Atler Steven. Information Systems: Foundation of E-business (4th ed.). ISBN: 10: 0130617733 and/or 13: 978-0130617736

Course Outcomes:

On completion of the course students will be able to

- Explored how technology can be used to improve health care delivery in health care organizations and in public health.
- Acquired breadth of knowledge of the principles of health informatics.
- Developed basic skills in using health informatics principles to improve practice.
- Acquired a conceptual and theoretical framework of the design, development,

PGDIT119: Sensor and interfacing

COURSE OBJECTIVES

The course presents real-time wired and wireless interfacing of microcontrollers, microprocessors, and microcomputers to the external world, including interfacing of I/O devices with minimum hardware and software, data acquisition with and without microprocessors, data communications, transmission and logging with embedded computers.

COURSE CONTENT

Introduction on computing, architectures, processors, and technologies, Bus architectures, Digital I/O, D/A and A/D signal conversions and converters, Interfacing aspects in data communications, Demos: Examples of bus architectures, Updates on new concepts, technologies, protocols, and software, Demos:

Examples of bus architectures, modules, systems, and new devices, Updates on new computer concepts, technologies, protocols, and software.

COURSE OUTCOME

- Use concepts in common methods for converting a physical parameter into an electrical quantity
- Choose an appropriate sensor comparing different standards and guidelines to make sensitive measurements of physical parameters like pressure, flow, acceleration, etc
- Design and develop sensors using optical methods with desired properties
- Evaluate performance characteristics of different types of sensors
- Locate different type of sensors used in real life applications and paraphrase their importance
- Create analytical design and development solutions for sensors.

Recommended Books.

1. W. Kinsner, Microcontroller, Microprocessor, and Microcomputer Interfacing for Real-Time Systems. Lecture Notes, 2010, 643 pp.
2. W. Kinsner, Laboratories for Microcontroller, Microprocessor, and Microcomputer Interfacing for Real-Time Systems. Lab Notes; 2010, 92 pp. (Major Revision)
3. Jonathan W. Valvano, Embedded Microcomputer Systems: Real Time Interfacing. Toronto, ON: Nelson/Thomson, 2007 (2nd ed.), 814 pp & CD-ROM. This book covers design methodologies with examples, using Motorola 6805, 6808, 6811, and 6812 machines. The CD-ROM includes a simulator to show internal and I/O activities, and many links to data sheets. {ISBN 0-534-55162-9}

PGDIT120: Dot Net Technology

COURSE OBJECTIVES:

The program will prepare our students to:

- Understand the basics of DOT Net Technology.
- Familiar with C#, VB net and ASP net
- 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 Handing, Exception Handing, 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.

COURSE OUTCOMES:
At the time of graduation, students will have demonstrated:

- Capable of basic understanding of DOT Net Technology.
- Able to compare and Familiar with C#, VB net and ASP net
- 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

PGDIT121: Software Testing and Quality Assurance

COURSE OBJECTIVES:
The objective of this course is to

- Define quality assurance plans
- Apply quality assurance tools & techniques

COURSE CONTENTS:
Introduction to Software Testing: Testing Definition, Why Testing,Testing Process Overview, V-Model, Verification and Validation Definition, Test Coverage, Test Levels: Unit Test, Smoke Test, Integration Test, System Test, User Acceptance Test – UAT, Test Types, Static vs. Dynamic Test, Regression Test, Performance Test, Security Test, Others, Test Team : Career Path and Test Engineer Capabilities, Team/Development Collaboration and Conflicts, Communication Skills, Writing Testable Requirements: Types of Requirements: Business Requirements, System Requirements, Technical Requirements, Customer Early Involvement, Requirements Modeling, Requirements Traceability, Requirements Documentation, Requirements Validation, Test Techniques: Static Test Review-Dynamic Testing, Test Coverage, Test Design Techniques: White vs. Black Box Test Techniques, Boundary Value, Equivalence Partitioning, Decision Tables, Cause Effect, Network Graphing, Guess Testing, Structure Testing, Procedure (Scenario) testing, Test Design and Defect Tracking: Test Case, Design- Identify Scenarios, Identify test cases, Document Test procedure, Review Procedure Defect Tracking: Standards, Process, Defect Types, Defect Severity, Defect Priority Test Process, Test Management and Measurement.

Course Outcome:

On completion of the course students will be able to

- Apply modern software testing processes in relation to software development and project management

- Create test strategies and plans, design test cases, prioritize and execute them.
- Manage incidents and risks within a project.
- Contribute to efficient delivery of software solutions and implement improvements in the software development processes.
- Gain expertise in designing, implementation and development of computer based systems and IT processes.

Books Recommended:

1. Software Testing and Continuous Quality Improvement, by W. Lewis (2000)
2. Software Testing in the Real World, by E. Kit (1995)
3. Managing the Testing Process, by R. Black (2002)

PGDIT122: Management Information System

COURSE OBJECTIVES:
The objective of this course is to

- Discuss information systems in global business
- Study ethical and social issues in information system
- Provide detail about e-commerce
- Study leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.

COURSE CONTENTS:
Introduction: Information Systems in Global Business Today, Global E-Business: How Businesses Use Information Systems, Ethical and Social Issues in Information Systems, Securing Information Systems, Telecommunications, the Internet and Wireless Technology, E-Commerce: Digital Markets, Digital Goods, Building Systems, Enhancing Decision Making, Structure project work through assignment of roles (e.g., project manager, systems analyst, programmer, and software version manager) and use of project work breakdown structure for task management, Manage responsibility on diverse teams through peer review and task accountability arrived at through consensus methods, Assess software, hardware and networking requirements of information system applications accounting for limited funds and/or manpower, Address issues of information system access, training and confidentiality.

COURSE OUTCOMES:
On completion of the course students will be able to

- Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.
- Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.
- Effectively communicate strategic alternatives to facilitate decision making.

Books Recommended:

1. Laudon, Kenneth C., and Laudon, Jane P., Management Information Systems-Managing Digital Firm, Tenth Edition, Prentice Hall, 2007.
2. Microsoft Access 2000 Step by Step, Catapault, Inc. 1999.
3. Barron and Lyskawa, Microsoft FrontPage 98 Illustrated Standard Edition, Course Technology. 1998.

PGDIT123: Telecommunication Network Management

COURSE OBJECTIVES:
Objective of this course is to

- Provide an intensive overview of the art and science of management of emerged and emerging telecommunications networks.
- Provide an insight of technical and management aspects of network management with emphasis on defining requirements.
- Analyze network management of real time connection oriented services and non-real time connectionless services is an area of network engineering that requires an understanding of the principles and tools available for successful network operation.

COURSE CONTENTS:
Network management standards, network management model, organization model, information model abstract syntax notation 1 (ASN.1), encoding structure, macros, functional model, Network management application functional requirements: Configuration management, fault management, performance management, security management, accounting management, common management, report management, polity based management, service level management. Telecommunication management network (TMN) architecture: Terminology, functional architecture, information architecture, physical architecture, TNN cube, TMN and OSI. Common management information service element (CMISE): CMISE model, service definitions, errors, scooping and filtering features, synchronization, functional units, association services, common management information protocol (CMIP) specification. Information Modeling for TMN: Rationale for information modeling, management information model, object oriented modeling paradigm, structure of management information, managed object class definition, management information base (MIB).Simple network management protocol (SNMP): SNMPv1, SNMPv2 communication model, functional model, SNMPv3, MIB security, remote monitoring (RMON) SMI and MIB, RMQN1 and RMON2, Network management examples: ATM integrated local management interface, ATM MIB, ATM digital exchange interface management, ADSL configuration management, performance management. Network management tools: Network statistics management, network management system, management platform case studies: OPENVIEW, ALMAP.

COURSE OUTCOMES:
On completion of the course students will be able to

- Gain knowledge of network management modelling, including the ITU's TMN.
- Utilise a network management application to control the transmission of a service over a hierarchical network.

Books Recommended:

- Network Management: Principles and Practice - Mani Subramanian, Addison Wesley, Pearson Education Asia publication.
- Fundamentals of Telecommunication Network Management - Lakshmi Raman IEEE Communication Society.
- Telecommunication Network Management: Technologies and Implementations - Airdarous Salah, Plevyak Thomas. Prentice Hall

PGDIT-124: Project Management and Quality Assurance

COURSE OBJECTIVES:

This course provides managers with the framework, tools and approaches to meet the quality requirements of their projects and their customers. Upon completion of this course student will be able to identify and address quality issues in all phases of project management life cycle. The course will be delivered through lectures, case reviews and team projects. Students individually and in teams will review cases and conduct team projects applying quality tools and techniques to their projects.

COURSE CONTENT:

Role of the Project Manager: Outline, Staff, Introduction, Definition of Project, Classical Engineering Projects and Software Projects, Software Methodologies, Software Project Types, Tasks of a Software Project Manager, The Triple Constraint. Project Startup: The Project's Starting, Negotiating Project Constraints, Cost Benefit Analysis, Startup Deliverables, Other Considerations, System Requirements, The Role of System Requirements, Deliverables, Objectives of the Requirements Specification, Creating the Requirements Specification, Analysis Phase Activities. Methodologies: Methodology, Phases and Activities, Deliverables, Other Lifecycle Models, Estimation, Why Estimate?, When are Estimates Done?, Estimation Methods. Project Framework: Elements of the Framework, Standards and Quality, Framework Activities. Project Monitoring: Purpose of Monitoring, Monitoring Expenditure, Monitoring Work, Cost/ schedule Milestones, Earned value, Managing Deviations and Variations, Technical Audits, Project Progress Reporting. Human Factors: People in the Project, Staff as Individuals, Management, Managing Staff, Change Management, Improving Processes, Risk, The Natureof Risk, Risk Management Plan, Risk Identification, Risk Analysis, Risk Response Planning, Completion Activities. Project Completion and Implementation: Project Team Actions at Completion, What You Have to Do When You Thought You Were Done, Learning Lessons, Professional Ethic.

COURSE OUTCOME:

- To do Session Overview
- To do Personal Introductions
- To do Defining Quality
- To do Project Quality and Project Scope
- To do Quality Management's Evolution
- Quality Planning for Customer Satisfaction
- Writing Quality-Supportive Requirements
- Building a Standards-Requirements Matrix
- Quality Assurance Tools

Books Recommended:

- Information Technology Project Management - Marchewka, J. T.
- Software Engineering 7 - Sommerville, I
- Software Project Management - Hughes, B and Cotterell, M
- Managing the Software Process - Humphrey, W
- Software Engineering Economics - Boehm, B
- Systems Engineering and Analysis - Blanchard, B. S and Fabrycky W.J
- Software Project Management - Peterson

PGDIT-125: Recent Trends in ICT

Course Objectives.

To provide the most recent trends to students.

Course Content.

All branches of ICT/IT which are related in the aspect of latest technology.

Books Recommended.

Books will be chosen by instructors and those will be updated by instructors from time to time.

PGDIT-126: Projects

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

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