

Sem	Course Code	Part	Courses	Hour	Credit	Marks		
						Int. Marks	Ext. Marks	Total Marks
I	14U1LT01	I	Tamil-I	6	3	25	75	100
	14U1LE01	II	English I	6	3	25	75	100
	14U1CTC01	IV	Core – I Digital Computer Fundamentals and C Programming	6	5	25	75	100
	14U1CTCP01	IV	Core I P – Programming in C Lab	5	3	40	60	100
	14U1MAA04	III	Allied-I Numerical Methods	5	4	25	75	100
	14U1VE01		Value Education	2	2	25	75	100
TOTAL				30	20	165	435	600
II	14U2LT02	I	Tamil-II	6	3	25	75	100
	14U2LE02	II	English-II	6	3	25	75	100
	14U2CTC02	IV	Core II - Programming in C++	6	5	25	75	100
	14U2CTCP02	IV	Core II P - Programming in C++ Lab	5	3	40	60	100
	14U2MAA08	III	Allied II Discrete Mathematics	5	4	25	75	100
	14U2ES01		Environmental Studies	2	2	25	75	100
TOTAL				30	20	165	435	600
III	14U3CTC03	I	Core III-Computer Architecture	6	3	25	75	100
	14U3CTC04	II	Core IV-Operating systems	6	3	25	75	100
	14U3CTC05	IV	Core V- Relational Database Management Systems	5	5	25	75	100
	14U3CTCP03	IV	Core V P- RDBMS Lab	3	3	40	60	100
	14U3MAA01	III	Allied-III Resource Management Techniques-1	5	4	25	75	100
	14U3CTN__	VI	NMEC-I	2	2	25	75	100
	14U3CTS01	VII	SBEC-I - Office Automation	3	2	25	75	100
TOTAL				30	22	190	510	700
IV	14U4CTC06	I	Core VI-Web services	6	3	25	75	100
	14U4CTC07	II	Core VII- Computer Networks	6	3	25	75	100
	14U4CTC08	IV	Core-VIII- Visual Basic	6	5	25	75	100
	14U4CTCP04	IV	Core-VIII P- Visual Basic Lab	3	3	40	60	100
	14U4CMA04	III	Allied-IV Cost and Management Accounting	5	4	25	75	100
	14U4CTN__	VI	NMEC-II	2	2	25	75	100
	14U4CTS02	VII	SBEC-II DTP Package	2	2	25	75	100
TOTAL				30	22	190	510	700
V	14U5CTC09	IV	Core-IX Java Programming	6	5	25	75	100
	14U5CTC10	IV	Core-X Compiler Design	5	5	25	75	100
	14U5CTC11	IV	Core-XI Data Mining and Data Warehousing	5	5	25	75	100
	14U5CTE__	V	Elective –I	5	5	25	75	100
	14U5CTCP05	IV	Core-IX P Programming in Java Lab	6	4	40	60	100
	14U5CTS04	VII	SBEC –III (Computer installation and Servicing)	3	3	25	75	100
TOTAL				30	27	165	435	600
VI	14U6CTC12	IV	Core-XII Web Technology	6	6	25	75	100
	14U6CTE__	V	Elective –II	5	5	25	75	100
	14U6CTE__	V	Elective –III	5	5	25	75	100
	14U6CTCP06	IV	Core-XII P Web Technology Lab	6	4	40	60	100
	14U6CTPR01	IV	Core-XIII P Project Work	5	5	40	60	100
	14U6CTS05	VII	SBEC –IV (Mobile Application Development)	3	3	25	75	100
	14U6EX01		Extension Activities	-	1	-	-	-
TOTAL				30	29	180	420	600
GRAND TOTAL				180	140	1005	2745	3800

ELECTIVE COURSES

ELECTIVE – I

Semester	Course Code	Course Name
V	14U5CTE01	Artificial Intelligence and Expert Systems
V	14U5CTE02	Software Engineering
V	14U5CTE03	Management Information System

ELECTIVE – II

Semester	Course Code	Course Name
VI	14U6CTE04	Client /Server Techniques
VI	14U6CTE05	Extreme Programming
VI	14U6CTE06	Software Testing

ELECTIVE – III

Semester	Course Code	Course Name
VI	14U6CTE07	Wireless Application Protocols
VI	14U6CTE08	Mobile Computing
VI	14U6CTE09	Digital Image Processing

Subject Title	Computer Architecture	Semester	III
Subject Code	14U3CTC03	Specialization	NA
Type	Core	L:T:P:C	6 : 0 : 0 : 3

Objectives

1. To learn about the I/O devices, Memory, Various components in system and the principles of computer system.

Unit	Syllabus Contents	Number of Sessions
I	Digital Logic Circuits: Map Simplifications – Combinational circuits – Flip Flops – Digital Components: Integrated circuits – Decoders – Multiplexers. Register Transfer and Micro operations: Register Transfer – Bus and Memory Transfers – Arithmetic Micro operations – Logic Micro operations – Shift Micro operations.	12
II	Central Processing Unit : General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control – Reduced Instruction Set Computer (RISC).	12
III	Computer Arithmetic: Addition and Subtraction – Multiplication Algorithm – Division Algorithm – Floating Point Arithmetic Operations – Decimal Arithmetic Units – Decimal Arithmetic Operations.	12
IV	Input/output Organization: Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt – Direct Memory Access – Input-Output Processor – Serial Communication. .	12
V	Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.	12

Learning Resources

Text Books	1. “Computer System Architecture” by M.Morris Mano, Fifth Edition, Pearson Prentice Hall Private Limited, NewDelhi, 2014.
Reference Books	1.Computer System Architecture” By P. V. S. Rao,PHI Private Ltd,2009 2.“Computer Systems Organization & Architecture” by Carpinelli, Third Edition,Pearson Education,2008 3.“Computer Organization & Architecture” by William Stallings, Seventh Edition, 2009.
Web Sites / Links	1.dspace.utamu.ac.ug 2. www.slideshare.net/.../computer-computer-system-architecture

Subject Title	Operating Systems	Semester	III
Subject Code	14U3CTC04	Specialization	NA
Type	Core	L:T:P:C	6 : 0 : 0 : 3

Objectives

1. This course provides the overview of computer system and the operating system, the concepts of process management, memory management, storage management, protection and security issues, and distributed systems.

Unit	Syllabus Contents	Number of Sessions
I	Operating System Overview: Operating System Objectives and Functions. History of Operating System: First – Second – Third – Fourth Generation Operating System. Types of Operating System: Main Frame – Server – Multiprocessor – Personal Computer – Embedded – Real-Time Operating System. The Evolution of Operating System – Major Achievements of Operating System.	11
II	Threads: Process and Threads – Multithreading – Thread Functionality – Mutual Exclusion and Synchronization: Principles of Concurrency – Mutual Exclusion – Semaphores. Deadlock and Starvation: Resources – Principles of Deadlock – Deadlock Detection and Recovery – Deadlock Avoidance and Prevention.	11
III	Memory Management: Memory Management Requirements – Memory Partitioning – Paging – Segmentation. Virtual Memory: Hardware and Control Structures. Operating System Software: Fetch Policy – Placement Policy – Replacement Policy – Basic Algorithms – Page Buffering	11
IV	Scheduling: Types of Scheduling: Long Term Scheduling – Medium Term Scheduling – Short-Term Scheduling. Scheduling Algorithm: Short Term Scheduling Criteria – The Use of Priorities – Alternative Scheduling Policies. File Management: Overview – File Organization and Access – File Sharing – Record Blocking – Secondary Storage Management.	12
V	I/O Devices-Organization of the I/O Functions: The Evolution of the I/O function-Direct Memory Access. I/O Buffering: Single Buffer-Double Buffer-Circular Buffer-The Utilities of Buffering. Disk Scheduling: Disk Performance Parameters-Disk Scheduling Polices-RAID.	11

Learning Resources

Text Books	1.“Operating Systems Internals and Design Principles” by William Stallings, Second Edition, PHI Learning Private Limited, New Delhi, 2008.
Reference Books	1.“Modern Operating Systems” by Andrew S. Tanenbaum, Third Edition, PHI Learning Private Limited, NewDelhi, 2011. 2.“Operating Systems”, by Achyut S Godbole, Second Edition, TMH Publishing Company Limited, New Delhi, 2008. 3.“Operating System Concepts”, by Silberschatz, Galvin and Gagne, Sixth Edition, John Wiley & Sons Inc 2002.
Web Sites / Links	1. http://faculty.salina.k-state.edu/tim/oss/Introduction/OSrole.html 2. www.tutorialspoint.com/operating_system/

Subject Title	Relational Database Management Systems	Semester	III
Subject Code	14U3CTC05	Specialization	NA
Type	Core	L:T:P:C	5 : 0 : 0 : 5

Objectives

1. To understand the concepts of Relational database management systems and enable the students to learn the data base systems, SQL, PL/SQL and Developer 2000. On successful completion of the course the students should understand the designing the data base and concepts of database management systems.

Unit	Syllabus Contents	Number of Sessions
I	Introduction to DBMS: Information – Data and Data Management – Characteristics of a data in a database — Functions of DBMS – Components of DBMS – data dictionary. Data Base Architecture and Design: Introduction – Data base architecture – data abstraction. Entity –Relationship Modeling: Introduction – ER Model – Components of ER model – Relationships: Degree-Connectivity-Cardinality– ER modeling symbols. Data Normalization: Normalization-1NF-2NF-3NF-BCNF-4NF-5NF– Denormalization.	11
II	Oracle9i: Overview: Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL *Plus Environment – SQL – Logging into SQL *Plus - SQL *Plus Commands – Errors & Help – Alternate Text Editors - SQL *Plus Worksheet - iSQL *Plus. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.	11
III	Working with Table: Data Management and Retrieval: DML – Adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records –Retrieving Data from Table – Arithmetic Operations – Restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. Functions and Grouping: Built-in functions –Grouping Data. Multiple Tables: Joins and Set operations: Join – Set operations.	11
IV	PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT...FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.	12
V	PL/SQL Composite Data Types: Records – Tables – Varrays. Named Blocks: Procedures – Functions – Packages –Triggers – Data Dictionary Views.	11

Learning Resources

Text Books	1. “Fundamentals of Data base management System” – Alexix Leon and Mathew Leon, TMH Publications Reprint, 2010. 2. “Database systems using oracle” – Nilesh Shah, 2nd edition, PHI.
Reference Books	1. Database Management Systems – Arun Majumdar, Pritimoy Bhattacharya, TMH. 2. Database Management Systems – Gerald V. Post, 3rd edition, TMH.
Web Sites / Links	1. http://www.studytonight.com/dbms/rdbms-concept 2. http://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm

Subject Title	Relational Database Management Systems Lab	Semester	III
Subject Code	14U3CTCP03	Specialization	NA
Type	Core	L:T:P:C	0 : 0 : 3 : 3

Objectives

1. To understand the concepts of Relational database management systems and enable the students to learn the data base systems, SQL, PL/SQL and Developer 2000. On successful completion of the course the students should understand the designing the data base and concepts of database management systems.

List of Programs

1. Basic SQL Queries
 - i) DDL Statements
 - ii) DML Statements
2. Simple Queries using built in functions.
3. Simple Queries Using set operations.
4. Database Schema for a customer-sale scenario

Customer (Cust id : integer, cust_name: string)
 Item (item id: integer, item_name: string, price: integer)
 Sale (bill no: integer, bill_date: date, cust_id: integer, item_id: integer, qty_sold: integer)

For the above schema, perform the following:

 - a. Create the tables with the appropriate integrity constraints
 - b. Insert around 10 records in each of the tables
 - c. List all the bills for the current date with the customer names and item numbers.
 - d. List the details of the customer who have bought a product which has a price>200
5. Database Schema for a Student Library scenario

Student(Stud no : integer, Stud_name: string)
 Membership (Mem no: integer, Stud_no: integer)
 Book (book no: integer, book_name:string, author: string)
 Iss_rec(iss no:integer, iss_date: date, Mem_no: integer, book_no: integer)

For the above schema, perform the following:

 - a. Create the tables with the appropriate integrity constraints
 - b. Insert around 10 records in each of the tables
 - c. List all the student names with their membership numbers
 - d. List all the issues for the current date with student and Book names
 - e. List the details of students who borrowed book whose author is CJDATE
6. Database Schema for a Employee-pay scenario

employee(emp id : integer, emp_name: string)
 department(dept id: integer, dept_name:string)
 paydetails(emp_id : integer, dept_id: integer, basic: integer, deductions: integer, additions: integer, DOJ: date)
 payroll(emp_id : integer, pay_date: date)

For the above schema, perform the following:

 - a. Create the tables with the appropriate integrity constraints
 - b. Insert around 10 records in each of the tables
 - c. List the employee details department wise

- d. List all the employee names who joined after particular date
 - e. List the details of employees whose basic salary is between 10,000 and 20,000
 - f. List the details for an employee_id=5
7. Write a PL/SQL program to find largest number from the given three numbers.
 8. Write a PL/SQL program to check whether the given number is Armstrong or not
 9. Write a PL/SQL program to implement trigger
 10. Write a PL/SQL program to implement cursor.

Subject Title	SBEC:I Office Automation	Semester	III
Subject Code	14U3CTS01	Specialization	NA
Type	SBEC	L:T:P:C	3 : 0 : 0 : 2

Objectives

1. To Provide awareness in automation and to ketch out the hidden talent of students community recruitment.

Unit	Syllabus Contents	Number of Sessions
I	Introduction: Introduction to MS-Office.MS-word: Introduction to word basics-Commands-Copying and Moving Text-Working with text- Find and Replace-Formatting Text-Mail Merge-Table-Spell Check and Grammar.	05
II	MS-EXCEL: Excel Basics-Introduction-Menus-Toolbars-Icons-Opening Excel-Cells-Entering and Editing Data-Creation of Chart-Naming Formulas-Functions.	05
III	MS-POWERPOINT: Introduction-Menus-Toolbars-Creating and Editing Slides-Working with PowerPoint.	03
IV	MS-ACCESS: Introduction-Starting Microsoft Access-Creating New Database-Opening Existing Database-Access Database Wizards-Tables-Creating Query.	04
V	MS-FRONTPAGE: Introduction-Menus-Toolbars-Creating Webpage-With Wizard-Hyperlinks	03

Learning Resources

Text Books	1.Sanjay Saxena,"MS-OFFICE 2000 for Everyone", Vikas Pub.House, NewDelhi. (Part-II, III, IV, V, VI& IX).
Reference Books	1. Joyce Cox, Joan Lambert, and Curtis Frye "Microsoft Step by Step ,Microsoft office Professional 2010", First Edition,2010
Web Sites / Links	1. https://en.wikipedia.org/wiki/Microsoft_Office

Subject Title	Web Services	Semester	IV
Subject Code	14U4CTC06	Specialization	NA
Type	Core	L:T:P:C	6 : 0 : 0 : 3

Objectives

1. To know about the role in implementing Service Oriented Architecture (SOA).

Unit	Syllabus Contents	Number of Sessions
I	Introduction: Role of XML-XML and the web- XML Language Basics-SOAP-Web Services-Revolution of XML-Service Oriented Architecture (SOA)	11
II	XML Technology: XML-Name Space-Structuring with schemas and DTD-Presentation Techniques-Transformation-XML Infrastructure.	11
III	SOAP: Overview of SOAP-HTTP-XML- RPC-SOAP, Protocol-Message Structure-SOAP with Attachments.	11
IV	Web Services: Overview-Architecture-Key Technologies-UDDI- WSDC-ebxml-SOAP and web services in E-Commerce.	12
V	XML Security: Security overview-Canonicalization-XML Security Framework-XML Encryption-XML Digital Signature.	11

Learning Resources

Text Books	1.Frank P Coyle XML, Web Services and the Data Revolution, Pearson Education,2002.
Reference Books	1.Sandeep Chatterjee,James Webber,"Developing Enterprise Web Services".Pearson Education,2004. 2.Ramesh Nagappan,Robert Skocylas and Rima PatelSriganesh,"Developing Java Web services", Wiley Publishing,Inc,2004.
Web Sites / Links	1. http://www.w3schools.com/webservices/ws_intro.asp 2. http://www.service-architecture.com/articles/web-services/web_services_definition.html

Subject Title	Computer Networks	Semester	IV
Subject Code	14U4CTC07	Specialization	NA
Type	Core	L:T:P:C	6 : 0 : 0 : 3

Objectives

1. To learn the concepts of state of art in network protocols, architecture and applications.

Unit	Syllabus Contents	Number of Sessions
I	Data communications – Components - Data Representation - Direction of data flow-Networks - Categories – Topologies - Protocols and Standards - ISO/OSI Model - Layers in the OSI model - TCP/IP Protocol suite - Addressing.	12
II	Physical Layer: Physical layer and Media: Analog and Digital – Data rate limits- bandwidth utilization: Multiplexing-Spread Spectrum – Transmission media –Guided media and unguided media-switching-circuit switched networks-virtual circuit networks.	12
III	Data Link Layer and Network Layer: Data link layer - Error Detection and Correction –Types of Errors – Redundancy - Detection Vs Correction - Forward error correction Vs Retransmission – Framing - Flow and Error control -Noiseless channels - Noisy channel – HDLC. Wireless channels: Bluetooth – connecting devices-SONET – Architecture - Layers of SONET. Networking – Addresses – IPv4 – IPv6 . IPV4 – Datagram – Fragmentation - Checksum – options. IPV6 – Advantages – Packet Format – Extension headers – Transition from IPV4 to IPv6 – Dual stack – Tunneling – Header Translation – ICMP – IGMP.	12
IV	Transport Layer: UDP – Ports for UDP – User Datagram – checksum – operations – uses .TCP –Services – Features – Segment – Connection – Flow Control – Error Control - SCTP. Congestion Control – Open loop – Closed loop – QOS – Integrated Services.	12
V	DNS – Distribution of Namespace – DNS in the Internet –DNS Messages – Types of Records - WWW and HTTP– Architecture – Web documents – HTTP.Presentation Layer – Protocols – Services. Session Layer: Protocols – Services.Network security: Cryptography – Symmetric-Key Cryptography – Asymmetric-Key Cryptography – Security Services - Digital Signature.	12

Learning Resources

Text Books	<ol style="list-style-type: none">1. "Data communications and Internetworking ", Behrouz A Forouzan, Fourth Edition,2006.2."Computer Networks",Tannenbaum , Fifth Edition.
Reference Books	<ol style="list-style-type: none">1."Computer Networks",C.R.Sarma,Jaico Publishing House,2012.2.James F.Kurose and Keith W.ROSS, "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education,Fifth Edition, 2012.3.Andrew S.Tanenbaum , " Computer Networks", PHI, Fourth Edition ,2008.
Web Sites / Links	<ol style="list-style-type: none">1.www.tutorialspoint.com/computer.../computer_networking.htm2.www.journals.elsevier.com/computer-networks/

Subject Title	Visual Basic	Semester	IV
Subject Code	14U4CTC08	Specialization	NA
Type	Core	L:T:P:C	6 : 0 : 0: 5

Objectives

1. To Students can learn to design and develop Windows-based business applications using Visual Basic.

Unit	Syllabus Contents	Number of Sessions
I	Customizing a form and writing simple programs:- starting a new project- common form properties-color properties-making a form responsive- creating stand alone windows programs. first steps in building the user Interface:- Toolbox- creating controls- The name property- properties of command button-Image controls- textboxes-labels-message boxes-The grid.	12
II	First steps in programming:- statements in visual basic-variables- data types-working with variables-Input box. Display information:- Displaying information on form-Format function- picture boxes- Richtext boxes- controlling program flow:- Determinate loops-making decision-select case-nested If-then's-Built-in-functions:- string functions- numeric functions-Date and time functions.	12
III	Writing your own functions and procedures:- Function procedures-sub procedures- advanced uses of procedures and functions. Organizing Information via code:- Lists-one dimensional Arrays-Arrays with more than one dimension-The new array based string.	12
IV	Organizing Information via controls:- control Arrays-List and combo boxes-The Flex Grid controls. Building Larger Projects:- The Doevents function an submain- Error Trapping. VB objects and on Introduction to object-oriented Programming:- Creating a object in visual basic-Building Your own classes.	12
V	An Introduction to Graphics :- Fundamentals of Graphics – Line and Shape controls – Line and Boxes. An Introduction to Programming with Database objects – other useful methods and Events for Data control. Clip Board , DDE , OLE , Data Control – Programming with Data Control – Monitoring Changes to the Databases – SQL – Basics Database Objects.	12

Learning Resources

Text Books	1.“Visual Basic 6 – from ground up” - Gray Cornell, Tata Mcgraw hill private limited – reprint 2011 2.Gary Comell – “Visual Basic 6.0 Programming”– Tata McGraw Hill Edition.
Reference Books	1.Peter nortan’s and Michael Groh , 1998 – “ Guide to Visual Basic 6 Techmedia” - “Visual Basic”- Paul Sheriff – PHI – Reprint 2008 2.“Mastering Visual Basic 6” – Evengelus petroutsus – BPB publications
Web Sites / Links	1. https://msdn.microsoft.com/en-us/library/2x7h1hfk.aspx 2. www.vbtutor.net/vbtutor.html

Subject Title	Visual Basic Lab	Semester	IV
Subject Code	14U4CTCP04	Specialization	NA
Type	Core	L:T:P:C	0 : 0 : 3 : 3

Objectives

1. To Students can learn to design and develop Windows-based business applications using Visual Basic.

List of Programs

1. Develop a VB Project to Check User Name & Password Given by User.
2. Develop a VB Project to Add & Remove Items From List Box.
3. Develop a VB Project to Copy all Items in a List Box to Combo Box.
4. Develop a VB Project to Enter and Display Student Information.
5. Develop a VB Project to Scroll Text from Left to Right Using Timer.
6. Develop a VB Project to Mini Calculator Functions.
7. Develop a VB Project to Documents typing using MDI Form.
8. Write a VB Coding to design a menu editor.
9. Develop a VB Project to Perform following Operations in MS-ACCESS database using DAO
 - a. Move First Record
 - b. Move Next Record
 - c. Move Previous Record
 - d. Move Last Record
10. Develop a VB Project to Insert a Record in database using ADO

Subject Title	SBEC – II DTP Package	Semester	IV
Subject Code	14U4CTS02	Specialization	NA
Type	SBEC	L:T:P:C	2 : 0 : 0 : 2

Objectives

1. The Students know of the versatility of the microcomputer with page-design software, enabling students to produce materials of near photo-typed quality.

Unit	Syllabus Contents	Number of Sessions
I	INTRODUCTION: Choosing the printing house - Hardware Requirement for DTP -General Design Considerations - Text Organization – Design Common Media Publication.	04
II	PAGEMAKER: Getting Started with PageMaker – Working in PageMaker – The PageMaker window – Working with text – Multiple Text Block. Editing Text: Making Changing in the Publication – Searching by Format – Replacing the Text. Formatting Text: Changing the Font Size – Making the text bold – Removing Boldface from the text – Underlining the text – Aligning the text.	04
III	Master pages: Adding Text to the Publication – Element on master pages – Creating a new Publication – Working with Columns. Managing and Printing a publication: Page Orientation – Page Numbering – Page Size – Dimension – Table of Contents – Managing Books – Printing a Publication.	04
IV	PHOTOSHOP- Starting Photoshop CS2 - Photoshop Program Window Working with Images: Editing Images – Color Modes.	04
V	Making Selections: Moving a Portion of Images – Editing Selections – Filling a Selection -Transforming Selections Painting Tools: Drawing Tools – Retouching Tools.	04

Learning Resources

Text Books	1. “COMDEX-DTP Course Kit” Vikas Gupta, Dreamtech Publishers- New Delhi, 2008.
Reference Books	1.”ADOBE PHOTOSHOP CS6 Bible”,Lisa DaNae Dayley and Brad Dayley,2006 2.”ADOBE IN DESIGN CC on Demand”, Steve Johnson,Que Publishing ,2013
Web Sites / Links	1. https://en.wikipedia.org/wiki/Desktop_publishing 2. http://www.businessdictionary.com/definition/desktop-publishing-DTP.html

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN [AUTONOMOUS]
ELAYAMPALAYAM, TIRUCHENGODE -637 205. DEPARTMENT OF COMPUTER SCIENCE
B.Sc. COMPUTER TECHNOLOGY

COURSE PATTERN AND SCHEME OF EXAMINATIONS UNDER CBCS
for the Candidates admitted from the year 2014-2015

Sem	Course Code	Part	Courses	Hour	Credit	Marks		
						Int. Marks	Ext. Marks	Total Marks
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	14U3CTN__	VI	NMEC-I	2	2	25	75	100
	14U3CTS01	VII	SBEC-I - Office Automation	2	2	25	75	100
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	14U5CTC10	IV	Core-X Compiler Design	5	5	25	75	100
	14U5CTC11	IV	Core-XI Data Mining and Data Warehousing	5	5	25	75	100
	14U5CTE__	V	Elective –I	5	5	25	75	100
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	14U5CTS04	VII	SBEC-IV (Computer installation and Servicing))	2	2	25	75	100
TOTAL				30	27	190	510	700
VI	14U6CTC12	IV	Core-XII ASP.Net	5	5	25	75	100
	14U6CTE__	V	Elective –II	5	5	25	75	100
	14U6CTE__	V	Elective –III	5	5	25	75	100
	14U6CTCP06	IV	Core-XII P ASP.Net Lab	6	3	40	60	100
	14U6CTPR01	IV	Core-XIII P Project Work	5	6	40	60	100
	14U6CTS05	VII	SBEC –V (Mobile Application Development)	2	2	25	75	100
	14U6CTS06	VII	SBEC-VI (Basics of Unix and Linux)	2	2	25	75	100
	14U6EX01		Extension Activities	-	1	-	-	-
TOTAL				30	29	205	495	700
GRAND TOTAL				180	140	1105	2895	4000

ELECTIVE COURSES

ELECTIVE – I

Semester	Course Code	Course Name
V	14U5CTE01	Artificial Intelligence and Expert Systems
V	14U5CTE02	Web Technology
V	14U5CTE03	Management Information System

ELECTIVE – II

Semester	Course Code	Course Name
VI	14U6CTE04	Client /Server Techniques
VI	14U6CTE05	Software Engineering
VI	14U6CTE06	Software Testing

ELECTIVE – III

Semester	Course Code	Course Name
VI	14U6CTE07	Wireless Application Protocols
VI	14U6CTE08	Object Oriented Analysis and Design
VI	14U6CTE09	Digital Image Processing

Subject Title	Java Programming	Semester	V
Subject Code	14U5CTC09	Specialization	NA
Type	Core	L:T:P:C	5 : 0 : 0 : 5

Objectives

- The objective of Java Programming is used web programming. Any Web developer needs to have the knowledge of Java programming.

Unit	Syllabus Contents	Number of Sessions
I	Introduction - Object Oriented Programming - History of Java – Byte Code – A first Simple program – I/O Basis – Reading / Writing Console Input/Output – Lexical Issues – Java Data types – Variables – Type Conversion and Casting – Arrays – Operators – Control Statements.	12
II	Classes and Objects: A Simple Class and Declaring Objects, Methods – Examples – Constructor’s – Inheritance – Basics – Using super - Creating a Multilevel Hierarchy – Packages and Interfaces: Packages – Access Protection – Importing Packages – Interfaces.	12
III	Exception Handling: Fundamentals – Types – Using try and catch – Built in Exceptions – Throwing our own Exception .Introducing AWT: AWT classes – Windows fundamentals - Working with frame windows – Working with graphics – Control fundamentals – Labels – Buttons – Text Field.	12
IV	Database programming: The Design of JDBC – JDBC Driver types – Uses of JDBC – SQL – Connecting to the database – Executing SQL – Statements – Managing Connections – Statements and Result sets – SQL Exception. The Applet Class-types of Applet- Basics-Applet Class – Architecture – An applet Skeleton - Applet Initialization and Termination- Overriding update()	12
V	Simple Applet Display Methods -Requesting Repainting -A Simple Banner Applet -Using the Status Window -The HTML APPLET Tag -Passing Parameters to Applets -Improving the Banner Applet -getDocumentBase() and getCodeBase() -AppletContext and showDocument() -The AudioClip Interface -The AppletStub Interface-Outputting to the Console	12

Learning Resources

Text Books	1.Herbert Schildt , The Complete Reference Java II,5th Edition , TATA Mc Graw-Hill 2002. 2.Cays.Hortmann hary cornell, Core Java Volume II – Advanced Features, Pearson education 2010.
Reference Books	1. Deital Deital “Java How to Program” Pearson Education,2005 2. Rashmi kanta Das “Core Java: For Beginners, Vikas Publishing Pvt Ltd,2009. 3. Martin Rinchart, “Java database development”, Tata Mcgraw Hill 2000.
Web Sites / Links	1. www.csee.umbc.edu/courses/331/spring03/0101/lectures/java02.ppt 2. www.slideshare.net/intelligotech/java-tutorial-ppt-7189933

Content beyond the syllabus:

1. Program to know how to connect Database connection using coding in Java.
2. Implement a program that prompts the user for height and weight values and displays the associated body mass index.

Subject Title	Compiler Design	Semester	V
Subject Code	14U5CTC10	Specialization	NA
Type	Core	L:T:P:C	5 : 0 : 0 : 5

Objectives

1. To introduce the major concept areas of language translation and compiler design.
2. To enrich the knowledge in various phases of compiler ant its use, code optimization techniques, machine code generation, and use of symbol table.

Unit	Syllabus Contents	Number of Sessions
I	Introduction to Compilers: Compilers and Translator – Need of Translator – The structure of a Compiler – Lexical analysis – Syntax analysis – Intermediate code generation –Optimization – Code generation – Compiler writing tools. Finite automata and lexical Analysis: The role of the lexical analysis – A simple approach to the design of lexical analyzers- Regular expressions to finite automata – Minimizing the number of states of a DFA- Lexical analyzer generator Lex.	12
II	The Syntactic specification of programming languages: Context free grammars –Derivations and parse trees - Capabilities of context free grammars. Basic parsing techniques: Parsers – Shift reduce parsing – Operator precedence parsing – Top down parsing – Predictive parsers-Parser Generators:YACC.	12
III	Syntax directed translation: Intermediate code – Postfix notation – Parse trees and syntax trees – 3 address code – Quadruples and triples –Boolean expressions – Statements that alter the flow of control. Symbol tables: The contents of a symbol table – Data structures for symbol table – Representing scope	12
IV	Run time storage administration: Implementation of a simple stack allocation scheme –Implementation of block-structured languages. Error deduction and recovery: Errors – Lexical phase errors – Syntactic phase errors – Semantic errors.	12
V	Introduction of code optimization: The principle sources of optimization – Loop optimization – The DAG representation of basic blocks –Global data flow analysis. Code generation: Object programs – Problems in code generation–A simple code generator – Register allocation and assignment – Code generation from DAG’s–Peepholes optimization.	12

Learning Resources

Text Books	1. Alfred V.Aho, Jeffrey D.Ullman, Principles of Compiler Design, Narosa Publications House,15 th Reprint 2002.
Reference Books	1. Alfred V.Aho, Monica S.Lam, Ravi sethi,Jeffrey D.Ullman,Compilers- Principles, Techniques and Tools by Pearson Education 2007. 2. Dick Grune, Henri E.Bal,Cerial J.H Jacobs, Koen G.Langendoen

	Modern Compiler Design , wiley India Ltd,2011. 3. Allen I.Holub, “Compiler Design in C” Prentice Hall of India Private Ltd New Delhi 2002.
Web Sites / Links	1. www.tutorialspoint.com/compiler_design/compiler_design_runtime_environment.htm 2. www.cs.fsu.edu/~xyuan/cop4020/compiler_phases.ppt

Content beyond the syllabus:

1. Develop an understanding of the compilation process.
2. Generate a parser for the MiniJava language using the CUP parser generator.

Subject Title	Data Mining and Data warehousing	Semester	V
Subject Code	14U5CTC11	Specialization	NA
Type	Core	L:T:P:C	5:0:0:5

Objectives

1. Understand data mining principles and techniques
2. Introduce DM as a method and acquaint the students with the DM techniques.

Unit	Syllabus Contents	Number of Sessions
I	Introduction: What motivated data mining?-Why is it important?-What is data mining?-Data mining-On what kind of data?-Data mining Functionalities-Classification of Data mining-Data mining task primitives-Integration of a Data mining System with a Database or Data Warehouse System-Major issues in Data mining	12
II	Data Preprocessing: Why Preprocess the Data?-Descriptive Data Summarization-Data Cleaning-Data Integration and Transformation-Data Reduction-Data Discretization and Concept Hierarchy Generation	12
III	Mining Frequent patterns, Associations and Correlations: Mining various kinds of association Rules-Classification and Prediction: What is Classification? What is Prediction? Issues regarding classification and Prediction-Bayesian Classification-Classification by Back propagation-Prediction	12
IV	Types of Data in cluster Analysis-Categorization of major Clustering methods Hierarchical methods-Density-based Methods-Spatial Data mining-Text mining-Data Mining Applications-Social Impacts of data mining-Trends in data mining	12
V	Data Warehouse and OLAP Technology: What is Data Warehouse? A Multidimensional Data Model-Data Warehouse Architecture-Data Warehouse Implementation	12

Learning Resources

Text Books	1. Jiawei Han and Micheline Kamber,"DATA MINING Concepts and Techniques", Morgan Kaufmann Publishers,Second Edition,2006.
Reference Books	1. Soman K. P, Shyam Diwakar, V. Ajay, Data Mining, Printice Hall, 2008. 2. Arun K.Pujari, "Data Mining Techniques", Universities Press (India) Limited, 2001. 3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson, 2008.
Web Sites / Links	1. https://en.wikipedia.org/wiki/Data_mining 2. www.hinduwebsite.com/webresources/data_warehousing.asp

Content beyond the syllabus:

1. Write down the drawbacks of the earlier existing decision support systems.
2. Justify that data warehouse is a blend of many technologies.
3. Justify that data warehouse is an environment not a product.

Subject Title	Programming in Java Lab	Semester	V
Subject Code	14U5CTCP05	Specialization	NA
Type	Core	L:T:P:C	6:0:0:3

Objective:

1. Write clear, elementary Java programs (applets and applications)
2. Use the Java interpreter to run Java applications
3. Read, write, and debug Java programs
4. Write programs using object-based programming techniques including classes, objects

List of Programs

1. Write a java program to generate Fibonacci series.
2. Write a java program to display tables from 1 to 10 using 2d Array.
3. Implementation of Classes and Objects concepts.
4. Implementation of Constructor.
5. Write a java program to create user defined exception.
6. Implementation of Interface concept.
7. Implementation of packages in java.
8. Implementation of multithreading.
9. Implementation of networking concepts.
10. Write a java program to illustrate a basic Applet.
11. Create an Applet program for recording student information
12. Implementation of Database programming using JDBC.

Subject Title	CorelDRAW	Semester	V
Subject Code	14U5CTS03	Specialization	NA
Type	SBEC:III	L:T:P:C	2:0:0:2

Objectives

1. To create illustrations, page layout, web graphics.
2. Students can able to use their own designing skills with this applications to create stunning illustrations, logos, advertisement.

Unit	Syllabus Contents	Number of Sessions
I	Understanding corelDRAW-graphics suite x4- corelDRAW-graphics suite applications-new and enhanced feature in corelDRAW- getting started with corelDRAW- exploring the workspace of corelDRAW- menu bar-standard-toolbar-property bar-tool box-drawing page-docker-color palette-drawing basic geometric figures- working with page layout	04
II	Working with lines-Drawing a curve-drawing calligraphic lines-about outline tool-defining lines and outlines setting-creating a calligraphic outline-adding an arrowhead	04
III	Working with objects-Selecting and deselecting objects-Deleting objects-sizing objects- combing objects-grouping in corelDRAW-grouping objects-ungrouping objects- applying convert to curve command on objects-selecting color on objects-filling objects-using fills-using pattern fills	04
IV	Working with text-Types of text-preparing layout for using the text-creating artistic text-creating paragraph text- converting text from one type to another changing the appearance- font-font size- alignment-applying effects- drop cap- bulleted list-wrapping paragraph-converting text to an object-curve command-breaking part text	04
V	Working with bitmaps-Changing vector images to bitmap images – converting vector images to bitmap images- converting vector images to bitmap images when exporting –importing a bitmap into drawing-cropping-resembling and resizing-special effects to bitmaps-color transform-sharpen-tracing	04

Learning Resources

Text Books	1. Comdex 9 in 1 DTP Course Kit, VIKAS GUPTA, Dream Tech Press
Reference Books	1. Learning CorelDRAW X4,Ramesh Bangia,First Edition,2003 2. CorelDRAW X7 Official Guide,BOUTON,Eleventh Edition
Web Sites / Links	1. product.corel.com/help/CorelDRAW/540229932/Main/EN/.../CorelDRAW-X7.pd 2. learn.corel.com > Graphics Tutorials > CorelDRAW Tutorials 3. www.coreldraw.com/us/pages/800382.html

Content beyond the syllabus:

1. Creating a logo
2. Create Transparent 3D Box
3. Creating a Party Invitation Card

Subject Title	Computer Installation and Servicing	Semester	V
Subject Code	14U5CTS04	Specialization	NA
Type	SBEC:IV	L:T:P:C	2:0:0:2

Objectives

1. Aims to equip participants with basic knowledge and skills about computer hardware and software maintenance and troubleshooting of common problems.

Unit	Syllabus Contents	Number of Sessions
I	The Visible PC: How the PC Works –input – processing – output – storage. The Complete PC: External Connections – Devices and their connections – Inside the system unit: Case – CPU – Ram – Motherboard – Power supply – Hard drive – Optical Drives.	04
II	Learning CPU: Memory and RAM – Address Bus – Modern CPU's - Intel Pentium early processors – Intel Pentium 4 – Intel core – AMD athelon – AMD Duron – Intel Celeron – Intel Pentium Dual Core – Intel Core i7. Types of RAM's: SDRAM – RDDRAM –DDRSDRAM - DDR2 – DDR3 – RAM Variations.	04
III	Learning Motherboard: CMOS – BIOS – POST - Expansion Slots – Motherboard Components – Hardware Technologies: Platter Based – Solid Based Drives – Parallel and Serial ATA's – SCSI – RAID. Removable Media: Flash Memory – USB – Flash Cards - Optical Devices – CD – DVD-Blue-ray Media's.	04
IV	Installing & Upgrading Windows: Hardware Requirements – type of installation - Backup & Restoring Data – Partition the Hard Drive and file System – Installing XP Professional – Post Installation Tasks – Boot Process – Partitioning Files.	04
V	Learning Local Area Networking: Topologies – Network organization – Configuring TCP/IP – Wireless Networking Components - Wireless Networking Standards – Connecting to the Internet. Computer Security: Security Concepts – Malicious Software – Virus Prevention and Recovery.	04

Learning Resources

Text Books	<ol style="list-style-type: none">1. Mike Meyers, "Introduction to PC Hardware and Troubleshooting", Tata McGraw-Hill, New Delhi, 2003.
Reference Books	<ol style="list-style-type: none">1. Craig Zacker & John Rourke, "The complete reference:PC hardware", Tata McGraw-Hill, New Delhi, 2001.2. B.Govindarajulu, "IBM PC and Clones hardware trouble shooting and maintenance", Tata McGraw-Hill, New Delhi, 2002.3. Stephen J.Bigelow, "Trouble Shooting, maintaining and Repairing PCs", Tata McGraw-Hill, New Delhi, 2001.
Web Sites / Links	<ol style="list-style-type: none">1. www.itap.purdue.edu/facilities/instructionallabs/resources/instructions.html2. http://www.ibm.com/support/knowledgecenter/SS3RA7_17.1.0/modeler_install_concurrentlic_admin_ddita/common/installation/common_admin_local.dita

Content beyond the syllabus:

1. Study about PC trouble shooting
2. Software up gradation
3. Learn the concepts of repairing and servicing PC

Subject Title	ASP.NET	Semester	VI
Subject Code	14U6CTC12	Specialization	NA
Type	Core	L:T:P:C	5:0:0:5

Objectives

1. Create a rich GUI for web based applications using a rich set of controls
2. Create secure (authentication and authorization) web applications
3. Personalize a web page using Web Parts

Unit	Syllabus Contents	Number of Sessions
I	Introduction the .NET Framework: .NET Framework – C#, VB.NET and the .NET Languages – CLR- .NET Class library. Learning the C# languages: C# language Basics- Variables- Data types – Variable Operations -Object based Manipulation - Conditional & Looping Structures- Methods, Types, Objects and Namespaces.	12
II	Web Form Fundamentals: HTML Control classes - Page class – Web Controls: Web Control classes- List classes – Table controls – AutoPostBack and Web control events. Tracing, Logging and Error Handling: Exception Handling – Handling Exceptions -Throwing your own exception - Logging exceptions - Error Pages - Page Tracing.	12
III	Validation: Understanding Validation – The Validation Controls. Rich Controls: The Calendar – The AdRotator – Pages with Multiple Views. State Management: View state - Custom cookies - Session state – Application state.	12
IV	ADO.NET Fundamentals: ADO.NET and Data Management – SQL Basics – ADO.NET Basics. ADO.NET: Direct Data Access – Creating a Connection – Defining a Select command – Updating data –Disconnected data access.	12
V	Data binding: Introducing Data Binding - Single Value Data Binding – Repeated value Data Binding - Data Source Controls. The Data Controls: The Grid View –The Details View-The Form View.	12

Learning Resources

Text Books	<ol style="list-style-type: none">1. Beginning ASP.NET 2.0 in C# 2005: From Novice to Professional (Beginning: From Novice to Professional). Matthew MacDonald (Author) publication: APress 2005. (Unit –I: Chapter 1,2&3 Unit-II :Chapter 5,6&7 Unit-III :Chapter 8,9&13 Unit- IV :Chapter 13,14&15 Unit-V :Chapter 17)
Reference Books	<ol style="list-style-type: none">1. Pro ASP.NET 2.0 in C# 2005-Matthew Macdonald and Mario Szpuszta- Apress2. C# 2008 for programmers –Third Editon-Deitel developer series:Paul J.Deitel and Harvey M.Deitel :Pearson.3. Murach’s ASP.NET 2.0 web programming C# 2005-Jeel Murach & Anne Boehm:SPD(Shroff publishers & Distributors pvt.Ltd)
Web Sites / Links	<ol style="list-style-type: none">1. www.slideshare.net/2. www.powershow.com/

Content beyond the syllabus:

1. AJAX (Asynchronous JavaScript and XML)
2. FTP Management

Subject Title	ASP.NET Lab	Semester	VI
Subject Code	14U6CTCP06	Specialization	NA
Type	Core	L:T:P:C	6:0:0:3

Objectives

1. Create a web based applications using a rich set of controls
2. Create secure web applications

Develop the following On-line Applications using ASP.NET.

1. Create a Web site
2. Simple Web Page Creation using Asp.Net
3. Personal Information System
4. Hotel Reservation Using Asp.Net
5. Banking System
6. Shopping System
7. Air-line Reservation System
8. Recruitment System
9. Quiz program.
10. Library Management.

Subject Title	Mobile Application Development	Semester	VI
Subject Code	14U6CTS05	Specialization	NA
Type	SBEC:V	L:T:P:C	2:0:0:2

Objectives

2. Gain a basic understanding of computer architecture and object oriented programming.
3. Understand Mobile application Design Principles.
4. Identify need and opportunity in app markets.

Unit	Syllabus Contents	Number of Sessions
I	Introduction to Open Source: What is Open Source- License Issues (MPL, GPL, and LGPL) and Open Source Vs Traditional Development Methodologies. Introduction to Android: Introducing Android-History of Mobile Software Development-Open Handset Alliance-the Android Platform-Layers of Android-Android SDK-Kinds of Android Components-Building a Sample Android Application.	04
II	Android Application Design Essentials: Anatomy of an Android Applications-Android Terminologies- Application Context-Actives - Services-Intents-Receiving and Broadcasting Intents-Android Manifest File and its common settings-Using Intent Filter-Permissions-Managing Application resources in a hierarchy-Working with different types of resources.	04
III	Android Application Design Essentials: User Interface Screen Elements- Designing User Interfaces with Layouts- Drawing and Working with Animation.	04
IV	Using Common Android APIs:Using Android Data and Storage APIs- Managing data using SQLite-Sharing Data between Applications with Content Providers-Using Android Networking APIs-Using Android Web APIs and Using Android Telephony APIs.	04
V	DDMS-Debug and Other View:DDMS - Dalvik Debug Monitor Server- LogCat View-File explorer-Breakpoints and Debug.	04

Learning Resources

Text Books	<ol style="list-style-type: none">1. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education, 2nd Edition, 2011.2. W. Frank Ableson, Robi Sen, Chris King, “Android in Action”, 2nd Edition, Manning Publications Co., 2011.
Reference Books	<ol style="list-style-type: none">1. Chris Haseman, “Android Essentials”, Apress Publications, 2008.2. James Steele, Nelson To, “The Android Developer’s Cookbook-Building Applications with the Android SDK”, Addison-Wesley Publications, 2011.
Web Sites / Links	<ol style="list-style-type: none">1. www.tonex.com2. developer.android.com

Content beyond the syllabus:

1. Learn about Latest Android based Applications
2. Scope of Android
3. Android application for education

Subject Title	Basics of Unix and Linux	Semester	VI
Subject Code	14U6CTS06	Specialization	NA
Type	SBEC:V	L:T:P:C	2:0:0:2

Objectives

1. To Introduce UNIX and LINUX workstations.
2. Develop a Deeper understanding of operating systems their functions and services.
3. To Learn the fundamentals of the UNIX and LINUX Commands.

Unit	Syllabus Contents	Number of Sessions
I	Introduction – Operating system – Function of Operating system – Types of Systems – Why study UNIX-Linux-Logging onto a system – Surveying the development of Unix and Linux – Issuing commands to execute utilities – UNIX Architecture – Features of UNIX – Locating commands – Internal and External commands – Command structure – Flexibility of command usage.	04
II	General purpose utilities: cal: The calendar – date: Displaying the System date – echo: Displaying a message – printf: An Alternate to echo – Email Basics – mailx – passwd – who. The File System: pwd: Checking your current directory – cd: Changing the current Directory – mkdir : Making Directories – rmdir: Removing Directories.	04
III	Handling ordinary Files – Basic File Attributes – Simple Filters – Filtering using Regular expression.	04
IV	The Linux operating system: The history of Linux – Linux Architecture – Linux compared to UNIX – Features and utilities in Linux – Shell available in Linux – Creating files using the Vi editor: Text editors – The Vi editors – The emacs editors – The joe editors. Managing Files and Directories: Introduction – Directory commands in Linux – File Commands in Linux.	04
V	Managing Documents: Locating files in Linux – standard files – Redirection – Filters – Pipes. Communicating with other users in Linux: mesg command – whoT- talk – write – finger – chfn utility – ping – traceroute command – ssh command – FTP command – ncftp command.	04

Learning Resources

Text Books	<ol style="list-style-type: none">1. Sumitabha das, “UNIX Concepts and Applications” fourth edition Tata Mcgraw Hill Publishing Company Limited,2006.2. Operating System LINUX, NIIT Prentice Hall of India Private Ltd, New Delhi,2003.
Reference Books	<ol style="list-style-type: none">1. John Muster “Introduction to UNIX and LINUX” Tata Mcgraw Hill Publishing Company Limited,20032. Richard Petersen “The Complete Reference” Tata Mcgraw Hill Edition, 2008.
Web Sites / Links	<ol style="list-style-type: none">1. https://www.linux.com2. http://www.ee.surrey.ac.uk/Teaching/Unix/unixintro.html

Content beyond the syllabus:

1. Some other Operating System with architecture.
2. Proprietary Operating System Vs Open Source Operating System.
3. Learn about Linux products.

Subject Title	Artificial Intelligence and Expert Systems	Semester	V
Subject Code	14U5CTE01	Specialization	NA
Type	Elective:I	L:T:P:C	5:0:0:5

Objectives

1. To provide an overview of topics in the field of Artificial Intelligence.
2. Working Knowledge of designing a expert systems and applying expert system technologies in designing and analyzing engineering systems.

Unit	Syllabus Contents	Number of Sessions
I	Introduction: Artificial Intelligence Problems- Artificial Intelligence Techniques-Criteria for Success. Problems, Problems Space, Search: State Space Search-Production Systems-Problem Characteristics- Issues in design of search. Heuristic Search Techniques: Generate & Test- Hill climbing- Best First, problem Reduction, Constraint satisfaction, Means End Analysis.	12
II	Knowledge Representation Issues: Representations and Mappings- Approaches to Knowledge representation-Issues in knowledge representations-The Frame Problem. Using Predicate Logic: Representing Simple Facts in Logic-Representing instance and ISA Relationships- Computable Functions and Predicates- Resolution-Natural deduction.	12
III	Representing Knowledge Rules: Procedural vs. Declarative Knowledge- Logic Programming- Forward vs Backward Reasoning- Matching- Control Knowledge-Symbolic Reasoning under Uncertainty: Introduction to Nonmonotonic Reasoning- Logics for Nonmonotonic Reasoning- Implementation Issues Augmenting Problem Solver- Implementation: Depth First Search-Implementation: Breadth First Search	12
IV	Statistical Reasoning: Probability and Bayes Theorem-Certainty Factors and Rule-based Systems- Bayesian Networks- Dempster- Shafer Theory- Fuzzy Logic- Weak slot -Filler Structures: Semantic Nets Frames. Strong Slot Filler Structures: Conceptual Dependency- Scripts	12
V	Game Playing: Overview-The Minimax Search Procedure-Adding Alpha-Beta Cutoffs-Additional Refinements- Expert Systems: Representing and using Domain Knowledge-Expert system Shells- Explanation- Knowledge Acquisition	12

Learning Resources

Text Books	<ol style="list-style-type: none">1. Elaine Rich ,Kevin Knight,Shivashankar B Nair, “Artificial Intelligence”, Tata McGraw-Hill Publication, 3rd Edition,2010
Reference Books	<ol style="list-style-type: none">1. Donald A.Waterman – A Guide to Expert Systems Tata Mcgraw Hill – second Edition,1991.2. Stuart Russell and Peter Norving ,”Artificial Intelligence – A Modern Approach”Second Edition,2007.
Web Sites / Links	<ol style="list-style-type: none">1. www. tutorialspoint.com2. www.myreaders.info3. www.listpdf.com

Content beyond the Syllabus:

1. The major advantages of AI over natural languages.
2. The role of the intelligent systems and their potential benefits.

Subject Title	Web Technology	Semester	V
Subject Code	14U5CTE02	Specialization	NA
Type	Elective:I	L:T:P:C	5:0:0:5

Objectives

1. It covers the TCP/IP Basics.
2. It includes Basics of Browser,tiers,servlets ,web security and XML.

Unit	Syllabus Contents	Number of Sessions
I	TCP/IP : TCP/IP Basics – Why IP address – Logical Address - TCP/IP Example- The concept of IP address – Basics of TCP – Features of TCP – Relationship between TCP and IP – Ports and Sockets – Active Open and Passive Open - TCP Connections – What makes TCP reliable? – TCP Packet format - Persistent TCP connections – UDP – Differences between TCP and UDP.	12
II	DNS – E-mail – FTP – TFTP – History of WWW – Basics of WWW and Browsing – HTML – Web Browser Architecture – Common gateway interface – Remote Login (TELNET).	12
III	Introduction to Web Technology: Popular Web Technologies- Tiers – Concept of a Tier – Java Web Technologies –Java Servlets – Introduction – Servlet Advantages – Servlet Lifecycle – Servlet Examples - Java Server Pages – Introduction – Elements of JSP.	12
IV	Web Security :Introduction – Principles of Security – Cryptography - Plain text and Cipher Text – Digital Certificates – Digital Signatukres – Secure Socket Layer. Network Security: Introduction – Firewalls – IP Security- Virtual Private Networks(VPN).	12
V	XML: Basics of XML – XML vs HTML – Electronic Data Interchange(EDI) – XML Terminology – Introduction to DTD – Document type Declaration – Element Type Declaration – Limitations of DTD.Online Payments – Introduction – Payment using Credit Cards – Secure Electronic Transaction(SET) – PayPal.	12

Learning Resources

Text Books	1. Achyut S Godbole & Atul Kahate “Web Technologies TCP/IP to Internet Applications Architectures” 2007, TMH.
Reference Books	1. Rajkamal, ”INTERNET AND WEB TECHNOLOGIES”, TMH.
Web Sites / Links	1. http://www.worldwebtechnologies.com/ 2. http://www.worldwebtechnologies.com/web-design-process.html

Content beyond the syllabus:

1. Design web pages using HTML
2. Web Designing software

Subject Title	Management Information System	Semester	V
Subject Code	14U5CTE03	Specialization	NA
Type	Elective:I	L:T:P:C	5:0:0:5

Objectives

1. Learn the MIS Basics.
2. To introduce the basic concepts of System analysis and design

Unit	Syllabus Contents	Number of Sessions
I	Introduction: MIS Concept – MIS Definition – Role of the MIS – Impact of the MIS –Management as a Control System.	12
II	Strategic Management of Business: Basics of Management Information Systems: Decision Making – Information Systems.	12
III	System Analysis and Design – Development of MIS –Applications of Management Information System – Decision Support Systems.	12
IV	Enterprise Management Systems – Technology of Information Systems – Database Management Systems – Object Oriented Technology (OOT) - Client Server Architecture.	12
V	Networks – Business Process Re-Engineering (BPR) – Data Ware House: Architecture to Implementation – Electronic Business Technology.	12

Learning Resources

Text Books	1. W.S.Jawadekar – Management Information Systems – 3rd edition, Tata McGraw Hill.
Reference Books	1. Robert Schultheis, Mary Sumner – Management Information System - 4thedition TMH.
Web Sites / Links	1. www.inc.com/encyclopedia/management-information-systems-mis.html 2. study.com/.../management-information-systems-mis-manager-decision-making-tools.... 3. https://mis.eller.arizona.edu/what-is-mis

Content beyond the syllabus:

1. Computer based MIS
2. Need for automation in MIS
3. Role of MIS in the management of agriculture

Subject Title	Client/Server Techniques	Semester	VI
Subject Code	14U6CTE04	Specialization	NA
Type	Elective:II	L:T:P:C	5:0:0:5

Objectives

1. To introduce the client/server computing basics.
2. To learn the Components of Client/Server Applications Concepts.

Unit	Syllabus Contents	Number of Sessions
I	Client/Server Computing – Advantages of Client / Server Computing – Technology Revolution – Connectivity – Ways to improve Performance – How to reduce network Traffic.	12
II	Components of Client/Server Applications – The Client: Role of a Client – Client Services – Request for Service. Components of Client/Server Applications – The Server: The Role of a Server – Server Functionality in Detail – The Network Operating System – What are the Available Platforms – The Server Operating system.	12
III	Components of Client/Server Applications – Connectivity: Open System Interconnect – Communications Interface Technology – Interprocess communication – WAN Technologies.	12
IV	Components of Client/Server Applications–Software: Factors Driving demand for application software development – Rising Technology Staff costs – Need to improve Technology –Need for Common Interface across Platforms – Client/Server System Development Methodology.	12
V	Components of Client/Server Applications–Hardware: Hardware /Network Acquisition – PC-Level Processing Units – Machintosh, notebooks, Pen – UNIX Workstation – x-terminals – Disk, Tape, Optical Disks, NIC and UPS.	12

Learning Resources

Text Books	1. Patrick Smith, Steve Guenferich “CLIENT/SERVER COMPUTING”, 2nd edition, PHI.
Reference Books	1. Dawna Travis Dewire, ”Client/Server computing”, Tata Mcgraw Hill, 2009. 2. Jafferey D.Schank, ”Novell’s guide to client server Application and Architecture” 3 rd Edition, BpB Publications , 2005. 3. Robert Orfali, Dan Harkey and Jeri Edwards, ”Client/server Survival Guide” 3 rd Edition John Wiley and Sons Inc , 2009
Web Sites / Links	1. http://www.ayton.id.au/gary/it/Delphi/C_CSMid1.htm 2. https://en.wikipedia.org/wiki/Client%E2%80%93server_model 3. http://www.jwriders.com/lib/clientserver.htm

Content beyond the syllabus:

1. Client/ Server Tools and Techniques
2. Intermediate client server techniques
3. Techniques for real-time client-server communication on the web

Subject Title	Software Engineering	Semester	VI
Subject Code	14U6CTE05	Specialization	NA
Type	Elective:II	L:T:P:C	5:0:0:5
Objectives			
<ol style="list-style-type: none"> 1. Introduce software engineering basics 2. To Learn Cost Estimation, Design notations and Software testing. 			
Unit	Syllabus Contents		Number of Sessions
I	Introduction to Software Engineering: Definitions – Size Factors – Quality and Productivity Factors. Planning a Software Project: Planning the Development Process – Planning an Organizational Structure.		12
II	Software cost Factors – Software Cost Estimation Techniques –Staffing-Level Estimation – Estimating Software Estimation Costs.		12
III	Software Requirements Definition: The Software Requirements specification – Formal Specification Techniques. Software Design: Fundamental Design Concepts – Modules and Modularization Criteria.		12
IV	Design Notations – Design Techniques. Implementation Issues: Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation Guidelines.		12
V	Verification and Validation Techniques: Quality Assurance – Walkthroughs and Inspections – Unit Testing and Debugging – System Testing. Software Maintenance: Enhancing Maintainability during Development – Managerial Aspects of Software Maintenance – Configuration Management.		12

Learning Resources	
Text Books	1. Richard Fairley, “Software Engineering Concepts, TMH 2007.
Reference Books	<ol style="list-style-type: none"> 1. Eve Anderson, Philip Greenspun, Andrew Grumet, “Software Engineering for Internet Applications”, PHI 2006. 2. Jeff Tian, “Software Quality Engineering” Student edition, 2006, Wiley India.
Web Sites / Links	<ol style="list-style-type: none"> 1. www.softwareengineerinsider.com/articles/what-is-software-engineering.html 2. https://www.udemy.com/courses/development/software-engineering

Content beyond the syllabus:

1. Software Development Life Cycle
2. Learn about SRS (Software Requirement Specification)
3. Study about importance of testing with software engineering

Subject Title	Software Testing	Semester	VI
Subject Code	14U6CTE06	Specialization	NA
Type	Elective-II	L:T:P:C	5:0:0:5

Objectives

1. To introduce the Software Testing basics.
2. Learn about various kind of software testing methods

Unit	Syllabus Contents	Number of Sessions
I	Building Software Testing Strategy-Software Testing Design Techniques – Software Testing Tools and Selection of Test Automation Products- Software Testing Lifecycle and Software Testing Process.	12
II	Testing Effort Estimation and Test Planning- Software Test Effort Estimation Technique-Pre-Development Testing Requirements and Design Phase – Best Practices in Program Phase Unit, System and Integration Testing.	12
III	A Case Study on Acceptance Testing – Implementation an Effective Test Management Process-Building an Effective Test Organization – Performance Issues and Optimization Techniques.	12
IV	Choosing a Load Testing Strategy-Dodging the Bullets-Validating Mission-Critical Server Software for Reliability-Probing the Blind Spot-Testing in today’s Business and Usability.	12
V	Testing of Web-Based Applications-Testing of Embedded Software System used in Aerospace Applications- Testing Application for Security-Testing Metrics, Best Practices and Benchmarks.	12

Learning Resources

Text Books	1. Renu Rajani and Pradeep Oak,”Software Testing Effective Methods, Tools & Techniques” Tata McGraw-Hill,9 th Reprint 2009.
Reference Books	1. Srinivasan Desikan & Gopaldaswamy Ramesh, “Software Testing Principles and Practices” Pearson Education, Sixth Impression, 2008.
Web Sites / Links	<ol style="list-style-type: none"> 1. https://en.wikipedia.org/wiki/Software_testing 2. www.guru99.com/testing-methodology.html 3. www.guru99.com/testing-methodology.html

Subject Title	Wireless Application Protocols	Semester	VI
Subject Code	14U6CTE07	Specialization	NA
Type	Elective-III	L:T:P:C	5:0:0:5

Objectives

This course is intended for wireless device and WAP end-users, to help them to determine the techniques and standards available for planning, implementing and managing wireless/internet/computer communications, the basis for establishing their enterprise requirements.

Unit	Syllabus Contents	Number of Sessions
I	Introduction – Market Convergence – Enabling Convergence – Key Services for the Mobile Internet – Business Opportunities. Making the Internet “Mobile”: Challenges and Pitfalls – The Origins of WAP – WAP Architecture – Components of the WAP Standard – Network Infrastructure services Supporting WAP Clients – WAP Architecture Design Principles – Relationship to other Standards.	12
II	The Wireless Markup Language: Overview – The WML Document Model – WML Authoring – URLs Identify Content – Markup Basics – WML Basics – Basic Content – Events, Tasks and Bindings – Variables – Controls – Miscellaneous Markup – Sending Information – Application Security – Document Type Declaration – Errors and Browser Limitations.	12
III	Web Site Design: Computer Terminals versus Mobile Terminals – Designing a usable WAP Site – Structured Usability Methods – User Interface Design Guidelines – Design Guidelines for Selected WML Elements.	12
IV	Tailoring Content to the Client-Push Messaging: Overview of WAP Push – Push Access Protocol – WAP Push Addressing – Push Message– MIME media types for Push Messages – Push Proxy Gateway – Push Over – the – Air Protocol – Push Initiator Authentication and Trusted Content.	12
V	Wireless Telephony Applications: Overview of the WTA Architecture– The WTA Client Framework – The WTA Server and Security – Design Considerations – Application Creation Tool Box – Future WTA Enhancements – Mapping the Deployment Chain to the Business value chain – Security Domains – Linking WAP and the Internet – WAP Service Design – The Mobile Internet Future.	12

Learning Resources

Text Books	1. Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana and Others, The Wireless Application Protocol, Pearson Education, 2001.
Reference Books	1. Charless Arehare, Nirmal Chidambaram, and others, Professional WAP, Wrox press Ltd., Shroff publ. And Dist – Pvt. Ltd., 2001.
Web Sites / Links	1. earchmobilecomputing.techtarget.com › ... › Wireless technologies 2. www.protocols.com/pbook/wap

Content beyond the syllabus:

1. WAP Banking
2. WAP usages
3. WAP Present and Future

Subject Title	Object Oriented Analysis And Design	Semester	VI
Subject Code	14U6CTE08	Specialization	NA
Type	Elective-III	L:T:P:C	5:0:0:5

Objectives

- To develop background knowledge as well as core expertise in object oriented system.
- To provide the importance of the software design process.
- To assess the unified process and Unified Modeling Language

Unit	Syllabus Contents	Number of Sessions
I	Object model – Elements – Class and object – Nature of object/class – Relationship among objects – Relationship among classes – Quality classes and objects. Classification and Process - Classification – classical categorization –Conceptual clustering	11
II	Prototype theory – Analysis and design – Activities – Classical approaches – First principles –The Micro development process – The Macro Development process. UML Notations – UML model – Introduction –Use case – Usage – Class diagrams – Perspectives	11
III	Perspectives – Associations – Attributes – Operations – CRC cards – Usage – Interaction diagrams – Sequence diagrams – Collaboration diagrams – Package diagrams – Concurrent state diagram –	11
IV	Activity diagram – Decomposing and activity – Domain model – Specification model – System design – Detailed design – Coding Object Oriented model traditional techniques - Current techniques	12
V	-Approach to identify attribute – Service – Method. Behaviour Specifications – Static behaviour specification techniques Control – Documenting control.	11

Learning Resources

Text Books	1. Ali Bahrami”Object Oriented System Development”,Tata McGraw hill Publications.
Reference Books	1. Martin Fowler, Kendall Scott, “UML Distilled - Applying the standard object modeling language”, Addison Wesley, 1997. 2. Richard C Lee, William M Tepfenhart, “UML and C++ - A practical guide to object oriented development”, PH, 1997. 3. Grady Booch, “Object Oriented Analysis and Design with applications” II Edition Addison Wesley, 1994. 4. James Martin & James J. Odell, “Object Oriented Methods - A foundation”, Prentice Hall, 1997.
Web Sites / Links	1. http://www.edutechlearners.com/ 2. www.uml-diagrams.org

Content beyond the syllabus:

1. Scope of OOAD
2. Advantages and disadvantages of OOAD in software development
3. Practice of applications using OOAD

Subject Title	Digital Image Processing	Semester	VI
Subject Code	14U6CTE09	Specialization	NA
Type	Elective-III	L:T:P:C	5:0:0:5

Objectives

This course is designed to give undergraduate students all the fundamentals in digital image processing with emphasis in image processing techniques, image filtering design and applications.

Unit	Syllabus Contents	Number of Sessions
I	Introduction – What is DIP –Origins of DIP- Fundamental Steps in DIP – DIP Fundamentals – Elements of Visual perception – Image sampling & Quantization-Some Basic relationships between pixels.	12
II	Image Enhancement in the spatial Domain – Basic Gray level Transformations- Histogram Processing – Enhancement using Arithmetic /Logic operations- Basics of spatial filtering – Smoothing Spatial filters- Sharpening Spatial Filters.	12
III	Image Restoration – Image Degradation /Restoration process-Noise models – Restoration in the presence of Noise – only spatial Filtering – Periodic noise Reduction by Frequency domain Filtering – Estimating the degradation function – Inverse Filtering.	12
IV	Color Image Processing: Color fundamentals – Color transformations – smoothing & sharpening – color segmentation. Image Compression: Image Compression models – Error – Free Compression – Lossy Compression.	12
V	Image Segmentation: Detection of discontinuities –Edge linking & Boundary detection – Thresholding – Region – based Segmentation – Segmentation by Morphological watersheds – the use of motion in segmentation.	12

Learning Resources

Text Books	1. Gonzalez R.C & Woods R.E,"Digital Image Processing", Pearson Education, Second Edition, 2002
Reference Books	1. Rafael C.Gozalez, Richard E.Woods,"Digital Image Processing",Prentice Hall,3 rd Edition,2008 2. Anil K.Jain "Fundamentals of Digital Image Processing", Prentice Hall of India Pvt.Ltd
Web Sites /Links	1. www.tutorialspoint.com/dip/ 2. www.imageprocessingplace.com/

Content beyond the Syllabus:

1. Field of Digital Image Processing
2. Application and Usage of DIP
3. Case Study for Use of satellite imagery and DIP

Subject Title	PROJECT WORK (IN-HOUSE MINI PROJECT)	Semester	VI
Subject Code	14U6CTPR01	Specialization	NA
Type	Core-XIII P	L:T:P:C	0:0:5:5

Objectives

1. To understand the problem in clear and concise mode
2. To know how to connect the statement with the problem
3. Usage of features of programming language in project.
4. Design the whole project

PROJECT WORK PATTERN

1 FIRST REVIEW:

(20 Marks)

5. Project Title
6. Project Platform (Language / Package Selected)
7. Confirmation Letter (from Company / Industry)
8. Details of Internal Guide with Designation & Qualification (in the company / Industry)
9. Presentation

SECOND REVIEW:

(20 Marks)

1. Work Observation
2. Modules in Project (Design Screens Sample)
3. DFD / ERD / System Flow Diagram (Whichever Applicable)
4. Estimated Time of Completion
5. Completed Work in the form of Percentage Analysis
6. PowerPoint Presentation.

FINAL REVIEW:

(60 Marks)

1. Documentation
2. Screens Shots
3. DFD / ERD / System Flow Diagram (Whichever Applicable)
4. Final Project Report (with executable format including complete source code)

The Passing minimum shall be 40% out of 60 marks (24 Marks)