VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
Syllabus for T. Y. B. Sc (Computer Science)
With effect from June 2016

Name of Program	Bachelor in Computer Science
Abbreviation	B.Sc.(Computer Science)
Duration	3 Years (Full Time – Regular Course)
Eligibility	Candidate must have passed standard 12th (H.S.C.) Examination in Science stream through Gujarat Higher Secondary Board (G.H.S.E.B.) or any other equivalent board (C.B.S.E. / I.C.S.E.) with English subject. Students passed with vocational stream in 12^{th}(H.Sc.) are also eligible. Candidate passed ITI and Diploma are eligible as per the norms of Gujarat Government.
Objective of the Program	The basic objective of the program is to open a channel of admission for computing courses for students, who have done the 10+2 and are interested in taking computing/IT as a career. The program caters to the needs of the students aspiring to excel in the fields of computers. The program is designed to develop computer professionals versatile in almost all field of computer application .The main emphasis of the course is preparing students in the field of computer science and application areas of computer science including software development skills.
Program Outcome	It will open field for the aspiring students to opt further career or masters' level study in the fields of Research, design, Architecture and software development. It is also preparing aspiring students to work in companies at entry levels and also independently.
Medium of Instruction	English
Program Structure	Three years of Graduate level course comprises of six semesters.

Course Structure for Third Year B.Sc.(Computer Science) Semester-V

Course	Paper Code	Paper Title	Theory (Marks)		Practical (Marks)		Total Credits
			Internal	External	Internal	External	
Core Compulsory	501	Software Engineering-I	20	50	0	0	18
	502	Computer Networking-I	20	50	0	0	
	503	Computer Graphics	20	50	10	20	
	504	Java Programming – I	20	50	10	20	
	505	Fundamentals of PHP	20	50	10	20	
	506	Operating System-I	20	50	0	0	
		Minor Project	-	-	30	60	
Generic Elective	507-1 507-2 507-3 507-4	Open Source Tools Operation Research System Software Introduction of Datawarehousing & Datamining	30	70	NIL	NIL	2
Foundation Compulsory			20	50	NIL	NIL	2
Foundation Elective (to be selected from NCC / NSS / Saptadhara)			NIL				2
Total:			**170**	**420**	**60**	**120**	**24**

For Practical:

1. Batch Size – 20 Maximum
2. In case of more than 10 students in a batch, separate batch should be considered.
3. The journal should be certified by the concerned faculty and also by the Head of the Department, failing which the student should not be allowed to appear for External Practical Examination.
4. In House minor project will be carried out and Internal guide will supervise the project work.

P.N.: In case of Generic Elective Paper available in both semesters, it can be opted only during one semester . The same title can not be repeated in another semester.

Course Code	Theory		Practical		University Examination (Theory + Practical)		Internal Marks	Total Marks
	Credit	Hours	Credit	Hours	Duration	Marks		
501	2	2	-	-	2	50	20	70
502	2	2	-	-	2	50	20	70
503	2	2	4	2	2	50+20	20+10	100
504	2	2		2	2	50+20	20+10	100
505	2	2		2	2	50+20	20+10	100
506	2	2		-	3	50	20	70
507	2	3	-	-	3	70	30	100
Minor Project	-	-	2	6		60	30	90
Foundation Compulsory	2	2	-	-	2	50	20	70
Foundation Elective	2	-	-	-		-	-	-
Total:	**18**	**17**	**6**	**12**		**540**	**230**	**770**

Course Structure for Third Year B.Sc.(Computer Science) Semester-VI

Course	Paper Code	Paper Title	Theory (Marks)		Practical (Marks)		Total Credits
			Internal	External	Internal	External	
Core Compulsory	601	Software Engineering-II	20	50	0	0	18
	602	Computer Networking-II	20	50	0	0	
	603	Software Test Automation	20	50	0	0	
	604	Java Programming – II	20	50	10	20	
	605	Fundamentals of Mobile Computing	20	50	10	20	
	606	Operating System-II	20	50	0	0	
		Major Project	-	-	40	80	
Generic Elective	607-1 607-2 607-3	Software Quality Assurance Organizational Structure & Behaviour Information System	30	70	NIL	NIL	2
Foundation Compulsory			20	50	NIL	NIL	2
Foundation Elective (to be selected from NCC / NSS / Saptadhara)			NIL				2
Total:			**170**	**420**	**60**	**120**	**24**

For Practical:

1. Batch Size – 20 Maximum
2. In case of more than 10 students in a batch, separate batch should be considered.
3. The journal should be certified by the concerned faculty and also by the Head of the Department, failing which the student should not be allowed to appear for External Practical
4. In-house Major Project can be carried out and internal guide will supervise the project work during the Project hours allotted.

Course Code	Theory		Practical		University Examination (Theory + Practical)		Internal Marks	Total Marks
	Credit	Hours	Credit	Hours	Duration	Marks		
601	2	2	-	-	2	50	20	70
602	2	2	-	-	2	50	20	70
603	2	2	-	-	2	50	20	70
604	2	2	2	2	2	50+20	20+10	100
605	2	2	2	2	2	50+20	20+10	100
606	2	2	-	-	2	50	20	70
607	2	3	-	-	3	70	30	100
Major Project	-	-	2	8		80	40	120
Foundation Compulsory	2	2	-	-	2	50	20	70
Foundation Elective	2	-	-	-		-	-	-
Total:	**18**	**17**	**6**	**12**		**540**	**230**	**770**

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
Syllabus for T. Y. B. Sc (Computer Science)
With effect from June 2016

Course: 501: Software Engineering – I

Course Code	501
Course Title	Software Engineering - I
Credit	2
Teaching per Week	2 Hrs
Minimum Weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2016
Purpose of Course	Computer software engineers apply the principles and techniques of computer science, engineering, and mathematical analysis to the design, development, testing, and evaluation of the software and the systems that enable computers to perform their many applications.
Course Objective	1. To make students understand how to develop software. 2. To make students understand various components of software process model and their working. 3. To make students understand the importance of requirement analysis. 4. To make students understand various approaches of system design.
Pre-requisite	Prior knowledge of some software
Course outcome	After studying this course, students will be able to understand how software is developed and importance of various aspects of software engineering. This course will also help students appreciate the role of various design principles. After successful completion students will be able to perform requirement analysis and system design for their applications.
Course Content	Unit 1. Introduction to Software Engineering 1.1 Software 1.1.1 Software & Software Types 1.1.2 software characteristics & problems 1.1.3 Introduction to Software quality 1.2 Software Engineering & problem related to it 1.3 Software engineering approach 1.3.1 Introduction to phased development approach 1.3.2 Project management activities 1.3.3 Introduction to effort distribution Unit 2. Software Development Processes 2.1 Relationship between Processes, Projects and Products 2.2 Software process models 2.2.1 Linear sequential/ waterfall model 2.2.2 Prototype model 2.2.3 RAD model

	2.2.4 Incremental model 2.2.5 Spiral model Unit 3. Software Requirement analysis & specification 3.1 Introduction to requirement analysis & specification 3.1.1 Need for analysis 3.1.2 Activities, roles & responsibilities 3.2 Software requirements- Characteristics & issues 3.3 Requirement gathering formal & informal techniques 3.3.1 Interviews 3.3.2 Questionnaires 3.3.3 System walk through 3.3.4 Document survey 3.3.5 Introduction to FAST , QFD & JAD 3.4 Requirement modeling 3.4.1 Elements of analysis models 3.4.2 Structured modeling – data modeling, functional modeling, Functional modeling ,structure behavior , data, attribute, relationship, cardinality &ERD 3.4.3 Functional modeling – DFD & process specification 3.4.4 Introduction to behavioral modeling 3.4.5 Data Dictionary 3.5 Software Requirement Specification 3.5.1 Structure & Component of SRS 3.5.2 Characteristics of SRS 3.6 Introduction to Requirement validation 3.7 Case Study Unit 4. Software Designing 4.1 Introduction to Design 4.1.1 Importance of design 4.1.2 Relationship between analysis & design 4.1.3 Design Principals 4.2 Design Concepts 4.2.1 System level design concepts – Abstraction, Refinement , Modularity, Structural Partitioning & Structured Charts 4.2.2 Module level design concepts – Coupling , Cohesion 4.3 Detailed Design 4.3.1 Data design guidelines 4.3.2 Overview of Designing software architecture 4.3.3 Interface design guidelines 4.3.4 Procedural design techniques
Reference Books	1 Integrated Approach to Software Engineering Pankaj Jalote Narosa Publication. 2 Software Engineering: A Practitioner’s Approach 4e/5e,Roger S.

	Pressmann McGrawHill Publication. 3 Workbook on System Analysis and Design 1e/2e, Garg, Srinivasan PHI. 4 Software Engineering K. K. Aggrawal, Yogesh Singh New Age International Publishers. 5 Fundamentals of Software Engineering Carlo Ghezzi, Mehdi Jazayeri, Dino Mendrilo PHI. 6 Software Engineering Ian Summwerville Addison Wesley- Pearson Education. 7 Software Engineering K. L. James PHI. 8 System Analysis and Design Elias M. Awad Galgotia Publication. 9 System Analysis and Design in a changing world John W. Stazinger, Robert B. Jacobson, Stephen D Burd, Thomson Learning.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

T Y B. Sc. (Computer Science)

Syllabus for T. Y. B. Sc. Semester-V

Effective From: June-2016

Course: 502: Computer Networking –I

Course Code	502
Course Title	Computer Networking –I
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	This course imparts the knowledge of Fundamentals of Computer Networks.
Course Objective	Students should be exposed to fundamentals of computer networks and should be able to understand computer network related protocols and activities.
Pre-requisite	Basic Knowledge of Computer Organization
Course Out come	• Students should be able to identify various network types and their benefits and limitations. • Students should be able to identify various networking devices and their functions • Students should be able to understand network activities at various OSI layers. • Students should be able to understand network related threats and security mechanism.
Course Content	**1 Network Fundamentals:** 1.1 Introduction to Networks, Network topologies and types of networks. 1.1.1 What is networking? 1.1.2 Exchange, sharing, preserving and protecting information, sharing hardware and software resources, Need, Uses and advantages of Network. 1.1.3 Network in workplaces(Tools and Task) 1.1.4 Network topologies(Bus, Star, Ring, Star Bus, Star Ring, Mesh) 1.1.5 Client/Server, hybrid and Peer-Peer network. 1.1.6 Transmission media

	2 OSI Model 2.1 Introduction to OSI Model 2.2 OSI Model Lower layer Function (Physical and DataLink Layers), OSI Model Middle Layer Function (network and transport Layers), OSI Model Upper Layer Function (Session, Presentation and Application Layers). 2.3 Upper Layer Devices **3. Network hardware and Software** 3.1 Network Cards and Cables, Repeaters, Hubs, Routers and Bridges. 3.1.1 Network cards, repeaters–its use and selection criteria. 3.1.2 Splitting up networks 3.1.3. Bridges –Use and working of bridges 3.1.4. Switches-Use and working of switches 3.1.5 Routers –Use and working of Routers. 3.2 Network Operating Systems 3.2.1 Peer Network operating system (windows) – Networking features of Window-XP. 3.2.2 Client-Server Operating System –Their common features. **4. Network Security Issues, concept and terminology** 4.1 Definition of various types of security. 4.2 Security problems and possible problems (Theft, Unauthorized Disclosure, Information warfare, Accidental Data Loss)
Reference Books:	1. Networking Complete BPB Publication 2. Mastering Local Area Networks, Christa Anderson & Mark Minasi BPB Publication 3. Networking Essentials Study Guide, MCSE TataMcGrawHill Publication 4. Windows 2000N/W Infrastructure Design, MCSE, TataMcGrawHill 5. Windows 2000Professional Study Guide, TataMcGrawHill Publication 6. Computer Networks, TenanBaum PHI 7. Data communication & N/W, B. Forouzan, TataMcGrawHill Publication

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T Y B. Sc. (Computer Science)

Syllabus for T. Y. B. Sc. Semester-V

Effective From: June-2016

Course: 503: Computer Graphics

Course Code	503
Course Title	Computer Graphics
Credit	3
Teaching per Week	2 Hrs + 1 Practical Lab
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	Fundamental knowledge about Computer Graphics with practical implementation.
Course Objective	To provide basic concepts of graphics Implementation of basic objects practically Understand the geometry of shapes To understand graphic shadings and file formats
Pre-requisite	Basic knowledge about the Graphics and computer graphics.
Course Out come	At the end of this course, student will be able to understand various algorithms pertaining to Graphics primitive objects. Implementation of various algorithms and graphics file primitives. It also cover geometrical transformations and their implementations.
Course Content	**1.Overview of Computer Graphics** 1.1 Historical background of computer Graphics 1.2 Applications of Computer Graphics 1.3 Popular graphics software 1.4 Pixel graphics versus Vector Graphics 1.5 Hard copy graphics Devices **2. Graphics primitive** 2.1 Line Drawing Algorithms 2.1.1 Vecgen Algorithm 2.1.2 Brasenham Line Drawing Algorithm 2.2 Circle generating algorithms 2.2.1 Parametric circle drawing algorithm 2.2.2 Brasenham circle algorithm 2.3 Different line styles 2.3.1 Thick line 2.3.2 Line caps 2.3.3 Thick line joins 2.3.4 Pens and Brushes 2.4 Curves 2.4.1 DDA approach for drawing a circular arc 2.5 Text and Character Attributes 2.6 Anti Aliasing **3. Polygons** 3.1 Polygon formation 3.2 Polygon inside tests

	3.2.1 Even – odd method 3.2.2 Winding number method 3.2.3 Some other method for performing inside test 3.3 Polygon area filling 3.3.1 Flood fill method 3.3.2 Scan line fill method 3.3.3 Boundary fill **4. Geometric Transformation** 4.1 Basic transformation 4.1.1 Scaling, Translation, Rotation 4.2 Homogeneous Coordinates 4.3 Rotation relative to and Arbitrary point 4.4 Some other transformations: Reflection, Sharing 4.5 Coordinate Transformation 4.6 Inverse Transformation 4.7 Affine Transformation 4.8 Raster Transformation **5. Viewing in two dimensions** 5.1 Window and View port 5.2 Viewing Transformation 5.3 Clipping 5.3.1 Point Clipping 5.3.2 Line Clipping 5.3.3 Polygon Clipping 5.4 Sutherland – Hodgman Polygon clipping algorithm 5.5 Text Clipping 5.6 Multiple windowing **6. Color and Shading: Light Sources, Illumination, Shading, Transparency, Shadow, Colors** **7. Graphics File formats: Bitmap, JPEG, GIF** **Note: Practical based on unit 2, unit 3 and unit 4.**
Reference books	1) Computer Graphics, Donald Hearn, M Pauline Baker, PHI, New Delhi 2) Computer Graphics : Dr A A Desai, PHI 3) Computer Graphics, Herrington, PHI, New Delhi 4) Principle of Computer Graphics, Newman & Sproul, McGraw Hill 5) Interactive Computer Graphics, Giloi W K , PHI, New Delhi 6) Mukherjee & Jana : Computer Graphics : Algorithms & Implementations, PHI 7) Giloi W.K.: Interactive Computer Graphics – Prentice Hall India 8) New Man W. & Sproul P.F. - Principles of Interactive Computer Graphics, McGraw Hill. 9) Rogers D.F. – Procedural Elements for Computer Graphics McGraw Hill

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T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-V
Effective From: June-2016
Course: 504: Java Programming - I

Course Code	504
Course Title	Java Programming – I
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	To teach object oriented programming concepts through programming using Java as the computer Programming language.
Course Objective	1. To make students understand object oriented programming. 2. To make students understand various inbuilt java classes those are available along with its working. 3. To make students understand the importance of OOP methodology. 4. To make students understand various types of OOP programming techniques.
Pre-requisite	Fundamentals of Object Oriented Programming Language. Knowledge of C and C++.
Course Out come	Students will have knowledge about the Platform independent OOPs language and its concepts. Various features of java like exception handling, garbage collection, class structures of java and OOPS features in java.
Course Content	**Unit 1. Introduction to Java** 1.1. Properties of Java 1.2. Comparison of java with C++ 1.3. Java Compiler 1.4. Java Interpreter **Unit 2. Basic Concepts** 2.1. Identifier, Literals , Operators , Variables 2.2. Keywords , static and instance variables. 2.3. Data Types and wrapper class 2.4. Branching: If – Else, Switch 2.5. Looping : While, Do-while , For 2.6. Type Casting. 2.7. String and String Buffer class 2.7.1. Basic String operations 2.7.2. String comparison, concatenation 2.7.3. Important functions of String Buffer class. **Unit 3. Classes and Objects** 3.1. java class structure. Inheritance and Access Control 3.2. Polymorphism : Overriding and overloading. 3.2.1 this and super 3.3. Construction and Initialization

	3.4. Concepts of Data Hiding and Encapsulation, Access control 3.5. final, finalize(), finally, transient, volatile, memory leak 3.6. Static members, static block, static class, Garbage Collection 3.7.Concept of Abstract class 3.8. Interfaces 3.8.1. Introduction to Interfaces. 3.8.2. Interface Declaration, implementing and extending. 3.8.3. Difference between Abstract class and Interfaces. 3.9 Packages 3.9.1 Package Naming, Type Imports 3.9.2. Package Access, Contents, Defining and Importing Package **Unit-4: Exception Handling:** 4.1. Concepts of Exception Handling, try…catch block. 4.2 Types of Exceptions: 4.2.1 Uncaught exceptions, Nested try block 4.2.3 Throw clause 4.2.4 Finally clause 4.2.5 Difference between : Error and Exception, Checked and Unchecked Exceptions, Throw and Throws.
Reference Books:	1.The Complete Reference Java2 Herbert Schildt TMH, New Delhi 2. Mastering JAVA2 John Zukowski BPB 3. Teach Yourself Java2 platform in 21 days Lamey & Cadenhead Teach Media 4 Java in Nut shell - O'Relly Publication 5 Java Language Reference - O'Relly Publication

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T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-V
Effective From: June-2016
Course: 505: Fundamentals of PHP

Course Code	505
Course Title	Fundamentals of PHP
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	Understand concept of server side scripting language and implementing it practically. Learning fundamentals of dynamic website development using open source technology.
Course Objective	1. To make students understand Open source website development.. 2. To make students understand various inbuilt features of PHP and in-built functions. 3. Fundamentals of dynamic website development. 4. Using database like MySQL.
Pre-requisite	HTML, DHTML and fundamentals of Client side scripts.
Course Out come	Students will have knowledge about the Platform independent server side scripting language and developing steps to generate dynamic interactive basics of websites.
Course Content	**Unit-1 :** 1.Introduction to PHP 1.1. Installation of PHP and MySQL 1.2. PHP configuration in IIS & Apache Web Server and features of PHP 2. Writing PHP 2.1. How PHP code is parsed 2.2. Embedding PHP and HTML 2.3. Executing PHP and viewing in Browser 2.4. Data types 2.5. Operators 2.6. PHP variables: static and global variables 2.7. Comments in PHP **Unit-2 :** 3. Control Structures 3.1. Condition statements 3.1.1. If…Else , Switch, ? operator 3.2. Loops 3.2.1. While , Break and Continue Statement , Do…While , For, For each 3.3. Exit, Die, Return 3.4. Arrays in PHP **Unit-3:** 4. Working With Data 4.1. FORM element, INPUT elements

	4.2. Validating the user input 4.3. Passing variables between pages 4.3.1. Passing variables through GET , POST, REQUEST 5. Functions: 5.1. Built-in functions 5.1.1. Sring Functions: chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, stristr, str_replace, strrev, echo, print 5.1.2. Math Functions: abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand 5.1.3. Array Functions: count, list, in_array, current, next, previous, end, each, sort, rsort, assort, array_merge, array_reverse 5.2. User Defined Functions **Unit-4:** 6. Sessions and cookies 6.1. Concept of Session 6.2. Starting session 6.3. Modifying session variables 6.4. Un registering and deleting session variable 6.5. Concept of Cookies 7. Introduction of MySQL 7.1. Types of tables in MySQL 7.2. Query in MySQL: Select, Insert, Update, Delete 7.3. Truncate , Alias, . Order By 7.6. Database connectivity of PHP with MySQL
Reference Books:	1.Core PHP Programming ;Leon Atkinson ;Pearson publishers 2 The Complete Reference PHY; Stever Holzner; McGraw Hill 3 Beginning PHP 5.0 Database; Christopher Scollo, Harish Rawat, Deepak Thomas; Wrox Press 4 PHP – A beginners; Ashok Appu; Wiley 5 PHP 5.0 and MySql Bible; Tim Converse, Joyce Park, Clark Morgan John; Wiley & Sons 6 MySQL Bible; Steve Suehring John; Wiley &Sons 7 PHP Black Book; Peter Moulding – 8 PHP 5 and Mysql; Tim converse, Joyce Park and Clark Morgan; Bible Wiley 9 Beginning PHP 5.3; Matt Doyle; Wrox Publication

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T Y B. Sc. (Computer Science)

Syllabus for T. Y. B. Sc. Semester-V

Effective From: June-2016

Course: 506: Operating System – I

Course Code	506
Course Title	Operating System – I
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	This course imparts the Basic knowledge of structures and functions of Operating systems specifically related to Device Management and File systems and File Management.
Course Objective	Student should be able to understand types, structure and device and file related responsibilities of operating system
Pre-requisite	Fundamentals of Computer Organization, Basic Algorithms and Data Structures
Course Out come	• Students should be able to understand various types & structures of operating systems and their applications. •Students should be able to understand Device management and File Management related functions of modern operating systems. •Students should be able to understand algorithmic implementation of above mentioned functions of operating system
Course Content	**1. Operating System Concepts** 1.1. Evolution of Operating System & History 1.2. Need of an Operating System 1.3. Single User & Multi User Operating System 1.4. Elements of an Operating System 1.5. Operating System as a Resource Manager **2. Device Management** 3.1. Device Management Function 3.2. Device Characteristics 3.3. Disk space Management 3.4. Allocation and Disk Scheduling Methods **3. Introduction to File System and File Management** 3.5. File Concept 3.6. Operations on File 3.7. File Access Methods(Sequential Access and Direct Access) 3.8. Directory Systems File Management Functions. 3.9. File System and Directory Structure organization. 3.10. File Protection. **4. Introduction to Unix System**

	4.1 Unix System Architecture 4.2 Unix System Concepts 4.3 Kernel Data Structure 4.4 Inodes 4.5 Structure of a Regular File 4.6 Directories 4.7 Unix file System Commands – Ls, MkDir, ChDir, ChMod, Lseek, State, FState, Access,
Reference Books	1. Operating System Concepts, James Peterson McGrawHill 2. An OS Concept ,Silberschatz AdditionWesley Publication 3. An Operating Systems, W.Stallings Pearson Education 4. Understanding Operating Systems, I.M.Flinn, A.M. Mchoes – Thomson Learning 5. Operating Systems, Donovan M McGrawHill Publication 6. Operating Systems: A Design Oriented Approach, Crowley TataMcGrawHill Publication 7. Operating Systems, S. Godbole TMH. 8. Operating Systems: Design and Implementation, Tanenbaum & Woodhull 9. The Design of the Unix Operating System, Maurice J. Bach PHI

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Syllabus for T. Y. B. Sc. Semester-V
Effective From: June-2016
Course: GENERIC ELECTIVE (IDS) – 507-1

Course Code	**507-1 GENERIC ELECTIVE (IDS)**
Course Title	**Open Source Tools**
Credit	2
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	This course imparts the knowledge of open source technologies and it's development process and understanding of open source graphical tool GIMP.
Course Objective	To have awareness of open source technologies and development process. To get understanding on open source graphical tool GIMP.
Pre-requisite	NIL
Course Out come	After completion of this course Students should have knowledge about open source technologies and softwares and students should get understanding on open source graphical tool GIMP.
Course Content	**1.Introduction to Open Source** **1.1** .Open Source: Meaning, Need, History and Principles **1.2**. Success of Open Source **1.3** .Free Software and Open Source Software **1.4**. FOSS **1.5**. Open Source Initiative and Open Source Standards **1.6**. Software Freedom and Open Source Software Development **2.Open Source Projects** **2.1.** Open Source Project Development Process **2.2.** Open Source Project Maintenance **2.3.** Open Source Hardware **2.4.** Open Source Design **2.5.** Open Source Teaching Platform **2.6.** Case Study of Linux Project **3.Ethics and Economies of Open Source** **3.1.** Open Source and Closed Source Software **3.2.** Open Source Government **3.3.** Ethics of Open Source and Social Impact, Share Software and Resources **3.4.** Shared Software and Shared Sources **4.GIMP Basics** **4.1.** GIMP Basics, GIMP Windows and Dialogs: Toolbox, Image Window, Layers, Channels, Paths Dialogs, The Dialogs

	for Color, Brushes, Patterns, Gradients, and Palettes **4.2.** Loading, Saving and Creating New Images, RGB, Grayscale, and Indexed Images **4.3.** Layers and the Role: Layers Dialog and Layers Menu, Channels and their Relationship to Layers, Channels Dialog **4.4.** Conversions of Selections, Channel Masks, Layer Masks, and Alpha Channels, Masks and Selection
Reference Books	1. Open Source Technology, Kailash Vadera & Bhavyesh Gandhi, University Science Press, Laxmi Publications 2. Grokking the GIMP, Carey Bunks , New Riders Publishing 3. Open Source Technology and Policy, Fadi Greek & James Hugh , Cambridge University Press 4. Open Source for the enterprise, Dan Woods, Gautam Guliani, O'Reilly 5. http://www.gimp.org/tutorials/ 6. GIMP for Absolute Beginners, Jan Smith, Roman Joost , Apress 7. GIMP, Olivier Lecarme, Karine Delvare , Pearson Education

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T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-V
Effective From: June-2016
Course: 507-2 : OPERATION RESEARCH

Course Code	**507-2 GENERIC ELECTIVE (IDS)**
Course Title	**OPERATION RESEARCH**
Credit	2
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	This course imparts knowledge of mathematical model formulations and finding optimize solution of real world problem.
Course Objective	To introduce basic understanding of mathematical model formulation and finding optimize solution of real world problem with applications and give idea of game theory.
Pre-requisite	NIL
Course Out come	Student should be able to get basic understanding of mathematical model formulation and able to find optimize solution of real world problem.
Course Content	**1:Linear Programming Problem (LPP) and Simplex Method:** **1.1** Model Formulation Basic, **1.2** Non-basic, Degenerate, **1.3** Non-Degenerate and basic feasible Solution of LPP in the Standard Matrix form , **1.4** Graphical Solution. **1.5** Simplex Method **2: Transportation Problem** **2. 1** Transportation Problem, **2.2** Method for finding initial basic feasible Solution, **2. 3** Optimal Solution of TP Problem by MODI method, **2.4** Unbalanced Transportation Problem. 3: **Assignment Problem:** **2.1** Assignment problem, **2.2** The Hungarian method, Balanced & Unbalanced Assignment Problem. **4: Game Theory:** **4.1** Competitive Problem, **4.2** Two-persion zero –sum game, **4.3** Maximin and Minimax Principle, **4.4** Saddle point and the Value of the game(based on pure Strategies) **4.5** Mixed strategies ,

	4.6 Solution of games with saddle point , **4.7** Dominance rule
Reference Books:	1. OR Theory & Application , J.K Sharma , Mac Millian India Ltd.,1998 2. Operation Reasearch , Kanti Swaroop ,P.K.Gupta & Man Mohan , S.Chand & Son ,New Delhi,1098 3. Linear Programming, G.Handley , Narsa Publication House ,New Delhi,1995 4. Linear Programming, Transportation, Assignment, G.Paria , Books & Allied Pvt.Ltd.Calcutta-9 5. Linear Programming , P.M. Karak , New Central Book Agency Pvt.Ltd 6. Optimization method in O.R and System Analysis , K.V.Mittal & L.Mohan , New Age International Publications. 7. O.R. , Goel & Mittal , Pragati Prakashan ,Meerut.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-V
Effective From: June-2016
Course: 507-3 : System Software

Course Code	**507-3 GENERIC ELECTIVE (IDS)**
Course Title	**System Software**
Credit	2
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	This course imparts knowledge of System Softwares and Language processing activities and idea of assemblers , compilers and interpreters.
Course Objective	To Give idea of System Softwares and Language processing activities and idea of assemblers , compilers and interpreters.
Pre-requisite	Basic idea of Fundamentals of computers and basic knowledge of computer programming
Course Out come	Students should get idea of System Softwares and Language processing activities and idea of assemblers , compilers and interpreters.
Course Content	**1. Introduction to system software and Language Processing** **1.1** System Software & its characteristics **1.2** Overview of System Software Categories **1.3** Language Processing Activities **1.3.1** Program Generation **1.3.2** Program Execution-Translation & Interpretation **1.4** Passes and Phases of Language Processor **1.4.1** Intermediate Representation of Program **1.4.2** Lexical Analysis-scanning **1.4.3** Syntax Analysis-parsing **1.4.4** Semantic analysis **1.4.5** Memory Allocation **1.4.6** Code Generation **1.5** Fundamentals of Language Specification **1.5.1** Programming Language Grammar, its classification,ambiguity in Grammatical Specification & its elimination **1.5.2** Binding and Binding Times **2 Assemblers** **2.1** Instruction formats, Addressing Modes and program Relocation

	2.2 Literals, symbols, expressions, program blocks, control section and program linking **2.3** Design of a One pass /Single pass assembler **3. Compilers and Interpreters** **3.1** Introduction to datatypes, data structures, scope rules and control structures **3.2** Basic Compiler Functions-Grammars, Lexical Analysis, Syntactic Analysis and Code Generation **3.3** Introduction to memory allocation **3.4** Compilation of expressions **3.5** Compilation of Control structures **3.6** Code Optimization **3.7** Interpreters, P-code Compilers & Compiler –compilers **4. Loaders & Linkers** **4.1** Basic Loader Functions **4.2** Relocation and Linking Concepts **4.3** Design of a loader / linker
Reference Books:	1. System Programming and Operating Systems , D M Dhamdhere , Tata McGrawhill Publication 2. System Software- An introduction to Systems Programming , Leland L. Beck & D Manjula , Pearson Education 3. System Software- An introduction to Systems Programming , Leland L. Beck , Addision Wesley 4. Compiler Design , Chattopadhyay Santanu , PHI 5. Engineering a compiler , Cooper Keith , Elsevier(Academic Press) 6. Compiler Construction: Principles and Practices , Louder Kenneth C , Cengage Learning

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

T Y B. Sc. (Computer Science)

Syllabus for T. Y. B. Sc. Semester-V

Effective From: June-2016

Course: GENERIC ELECTIVE (IDS) – 507-4

Course Code	**507-4 GENERIC ELECTIVE (IDS)**
Course Title	**Introduction of Datawarehousing & Datamining**
Credit	2
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	This course imparts the knowledge of Data Warehousing and Data processing and its phases. It also imparts knowledge of associative rules, classification and clustering in large datasets.
Course Objective	To have awareness .of what of Data Warehousing and Data processing and its phases and give idea of associative rules, classification and clustering in large dataset.
Pre-requisite	Students should have Basic knowledge of DBMS and RDBMS
Course Out come	Students should have awareness of What Data Warehousing and Data processing and its languages and student should get idea of associative rules, classification and clustering in large dataset. .
Course Content	**1. INTRODUCTION AND DATA WAREHOUSING** **1.1** Introduction, **1.2** Data Warehouse, **1.3** Multidimensional Data Model, **1.4** Data Warehouse Architecture, **1.5** Implementation **1.6** Data Warehousing to Data Mining **2. DATA PREPROCESSING, LANGUAGE, ARCHITECTURES, CONCEPT DESCRIPTION** **2.1** Preprocessing, Cleaning, Integration, Transformation, Reduction, Discretization, **2.2** Concept Hierarchy Generation, Data Mining Primitives, Query Language, **2.3** Graphical User Interfaces, Architectures, **2.4** Concept Description, Data Generalization, Characterizations. **3. ASSOCIATION RULES** **3.1** Association Rule Mining, **3.2** Single-Dimensional Boolean Association Rules from

	Transactional Databases **4. CLASSIFICATION AND CLUSTERING** **4.1** Classification and Prediction, **4.2** Issues, Decision Tree Induction, **4.3** Bayesian Classification, Association Rule Based, **4.4** Prediction, **4.5** Types of data, Categorization of methods.
Reference Books	1. Data Mining: Concepts and Techniques, J. Han, M. Kamber , Harcourt India / Morgan Kauffman, 2001. 2. Data Mining: Introductory and Advanced Topics , Margaret H.Dunham , Pearson Education 2004 3. Data Warehousing in the real world , Sam Anahory, Dennis Murry , Pearson Education 2003 4. Principles of Data Mining , David Hand, Heikki Manila, Padhraic Symth , PHI 2004. 5. Building the Data Warehouse 3rd Edition , W.H.Inmon , Wiley, 2003. 6. Data Warehousing, Data Mining & OLAP , Alex Bezon, Stephen J.Smith , MeGraw-Hill Edition,2001 7. Data Warehousing Fundamentals , Paulraj Ponniah , Wiley-InterscicencePublication, 2003

Course Structure for Third Year B.Sc.(Computer Science) Semester-VI

Course	Paper Code	Paper Title	Theory (Marks)		Practical (Marks)		Total Credits
			Internal	External	Internal	External	
Core Compulsory	601	Software Engineering-II	20	50	0	0	18
	602	Computer Networking-II	20	50	0	0	
	603	Software Test Automation	20	50	0	0	
	604	Java Programming – II	20	50	10	20	
	605	Fundamentals of Mobile Computing	20	50	10	20	
	606	Operating System-II	20	50	0	0	
		Major Project	-	-	40	80	
Generic Elective	607-1 607-2 607-3	Software Quality Assurance Organizational Structure & Behaviour Information System	30	70	NIL	NIL	2
Foundation Compulsory			20	50	NIL	NIL	2
Foundation Elective (to be selected from NCC / NSS / Saptadhara)			NIL				2
Total:			**170**	**420**	**60**	**120**	**24**

For Practical:

1. Batch Size – 20 Maximum
2. In case of more than 10 students in a batch, separate batch should be considered.
3. The journal should be certified by the concerned faculty and also by the Head of the Department, failing which the student should not be allowed to appear for External Practical
4. In-house Major Project can be carried out and internal guide will supervise the project work during the Project hours allotted.

Course Code	Theory		Practical		University Examination (Theory + Practical)		Internal Marks	Total Marks
	Credit	Hours	Credit	Hours	Duration	Marks		
601	2	2	-	-	2	50	20	70
602	2	2	-	-	2	50	20	70
603	2	2	-	-	2	50	20	70
604	2	2	2	2	2	50+20	20+10	100
605	2	2	2	2	2	50+20	20+10	100
606	2	2	-	-	2	50	20	70
607	2	3	-	-	3	70	30	100
Major Project	-	-	2	8		80	40	120
Foundation Compulsory	2	2	-	-	2	50	20	70
Foundation Elective	2	-	-	-		-	-	-
Total:	**18**	**17**	**6**	**12**		**540**	**230**	**770**

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
Syllabus for T. Y. B. Sc (Computer Science) Sem-VI
With effect from JANUARY 2017
Course: 601: Software Engineering – II

Course Code	601
Course Title	Software Engineering – II
Credit	2
Teaching per Week	2 Hrs
Minimum Weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2016
Purpose of Course	Computer software engineers apply the principles and techniques of computer science, engineering, and mathematical analysis to the design, development, testing and evaluation of the software and the systems that enable computers to perform their many applications.
Course Objective	1. To make students understand steps to design the software. 2. To make students understand various ways to test software. 3. To make students aware of importance of documentation.
Pre-requisite	Basic knowledge of Software Engineering.
Course outcome	After learning this subject students will know the importance of designing, testing and documenting the software.
Course Content	**Unit 1. Introduction to Coding** **1.1** Programming Practices **1.1.1** Structured programming practices **1.1.2** Event driven programming practices **1.1.3** Object oriented programming practices **1.1.4** Coding style **1.2** Code verification **1.2.1** Code reading & statics analysis **1.2.2** Code inspection & reviews **1.2.3** Unit testing **Unit 2. Software testing methods** **2.1** Software testing fundamentals **2.1.1** Testing objects **2.1.2** Testing Principals & guidelines **2.1.3** Testability **2.1.4** Error, Fault, Failure & Defect. **2.1.5** Test case **2.2** White box testing & techniques **2.2.1** Introduction to white box testing & benefits & limitations **2.2.2** Basis path testing **2.2.3** Control flow testing **2.2.4** Data flow based testing **2.3** Black box testing & techniques **2.3.1** Introduction to Black box testing & benefits & limitations

	2.3.2 Equivalence Partitioning **2.3.3** Boundary Value Analysis **2.4** Testing Process **2.4.1** Levels of testing **2.4.2** System testing **2.4.3** Test plan **2.4.4** Test case specification, execution & analysis **2.4.5** Debugging **Unit 3. Software Project Management** **3.1** Introduction of project management activities **3.2** Size, Cost & Effort estimation **3.2.1** Single variable models based estimation-LOC & FP based estimation **3.2.2** COCOMO Models **3.3** Feasibility study & Make-Buy decision **3.4** Project Scheduling **3.4.1** Task network & average duration estimation **3.4.2** Overview of PERT & CRM techniques for scheduling **3.4.3** Scheduling using timeline Charts **3.5** Project team **3.5.1** Roles in software projects **3.5.2** Team Structures **3.6** Software Quality Assurance **3.6.1** Verification & validations **3.6.2** Inspections, informal & formal reviews **3.7** Project monitoring **3.7.1** Project cost, schedule & milestone tracking **3.7.2** Reviews for project tracking **3.8** Risk management **3.8.1** Risk management overview **3.8.2** Risk management strategies **3.8.3** Risk identification & assessment **3.8.4** Risk mitigation ,monitoring & control
Reference Books	1 Software Engineering: A Practitioner's Approach, 4e/5e S. Pressmann McGrawHill Publication. 2 Integrated Approach to Software Engineering Pankaj Jalote Narosa Publication. 3 Software Testing Ron Patton SAMS-Techmedia Publication. 4 Practical Project Management Ivan Bayross Firewall Media. 5 Microsoft Ofice Project 2003 Bible Elanic Marmel Wiley Publishing. 6 Software Engineering K. K. Aggrawal, Yogesh Singh New Age International Publishers. 7 Fundamentals of Software Engineering carlo Ghezzi, Mehdi Jazayeri, Dino Mendrilo PHI. 8 Software Engineering Ian Summwerville, Addison Wesley Pearson Education. 9 Software Engineering K. L. James PHI.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-VI
Effective From: JANUARY 2017
Course: 602: Computer Networking - II

Course Code	602
Course Title	Computer Networking –II
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	This course imparts the Fundamentals knowledge of TCP/IP, Email Services, and basics of Wireless networking.
Course Objective	Students should be exposed to fundamentals of computer networks and should be able to understand computer network related protocols and activities.
Pre-requisite	Basic Knowledge of Computer Organization and computer network types, functions and applications and OSI layer functions
Course Out come	• Students should be able to understand working of various protocols of TCP/IP • Students should be able to Understand structure of web, web related protocols and email services • Students should be able to understand fundamentals of wireless networks and specifically cellular network and Bluetooth.
Course Content	**1. Basics of TCP/IP** 1.1 The TCP/IP protocol layer 1.2 IP addressing –IP Subnets –IP routing 1.3 Method of delivery–Unicast, Boradcast, Multicast andAnycast. 1.4 ICMP protocol , ARP protocol 1.5 Concepts of Port and Sockets. 1.6 User Datagram Protocol 1.7 TCP protocol **2. Internet Basics and Email services** 2.1 Architectural Overview WWW – Client side, Server side, Helper Applications, URLs, Statelessness and Cookies 2.2 DNS – Namespace, Resource records, Name servers 2.3 HTTP 2.4 Email Architecture and Services 2.5 The User Agent 2.6 Message Formats , Message Transfer, Final Delivery System 2.7 Simple mail transfer protocol(SMTP) **3. Concepts of Cellular phones** 3.1 working and signaling system 3.2 GSM and CDMA technology 3.3 3G and4Gtechnologyof mobile 3.4 GPRS System and its working. **4. Bluetooth technology** 4.1 Bluetooth Architecture

	4.2 Bluetooth Application 4.3 The Bluetooth protocol stack 4.4 Bluetooth Frame structure
Reference Books:	1. Networking Complete BPB Publication 2. Mastering Local Area Networks, Christa Anderson & Mark Minasi BPB Publication 3. Networking Essentials Study Guide, MCSE TataMcGrawHill Publication 4. Windows 2000N/W Infrastructure Design, MCSE, TataMcGrawHill 5. Windows 2000Professional Study Guide, TataMcGrawHill Publication 6. Computer Networks, TenanBaum PHI 7. Data communication & N/W, B. Forouzan, TataMcGrawHill Publication

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-VI
Effective From: JANUARY 2017
Course: 603: Software Test Automation

Course Code	603
Course Title	Software Test Automation
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June,2016
Purpose of Course	This course imparts the knowledge of Software Testing. The concepts of software testing, role of testing, testing tools and reporting are covered in this course. The course is aimed to give inner depth of Software testing.
Course Objective	To make students understand concepts of testing and testing practices. To make students understand test automation process. To make students understand Testing tools. To make students writing and tracking test cases.
Pre-requisite	Concepts of Software Engineering
Course Outcome	At the end of the course, student is expected to have clear concepts about the software testing and able to create various test case and will able to use various testing tools.
Course Content	**Unit 1. Testing concepts and practices** 1.1 Testing concepts 1.1.1 Testing, Testcase, Test Data, Test Result, Test suite, Test Reports 1.1.2 Testing activities-planning, management, execution and reporting 1.1.3 Test Exit criteria 1.1.4 Test case design practices 1.1.5 Test driven development 1.2 Testing practices 1.2.1 Ad-hoc testing and Systematic testing 1.2.2 Static testing and Dynamic Testing 1.2.2 Functional Testing and Behavioral Testing 1.2.3 Performance testing and security Testing 1.2.4 Usability Testing, Configuration Testing and Compatibility Testing 1.2.5 Smoke testing, Sanity Testing and Regression Testing 1.2.6 Practices for static testing **Unit 2. Test Automation** 2.1 Manual Testing vs. Test Automation-advantages and limitations. 2.2 Automation of various testing activities and related test tools 2.3 Criteria for selecting test tools **Unit 3. Testing Tools-1** 3.1 Testing tools for White box testing 3.1.1 Testing tools for code coverage 3.1.2 Testing tools for Data coverage 3.2 Testing tools for Unit Testing

	3.2.1 Writing and executing testcases with NUnit- NUnit framework, Test Fixture, Test, Septp & Tear Down, Asserts and Exception 3.2.2 Writing and executing testcases with JUnit- JUnit framework, Test Fixture, TestCase, Septp & Tear Down, Asserts and Exception **Unit 4. Testing Tools-2** 4.1 Testing tool for Blackbox testing 4.1.1 Test recording and playback using Selenium 4.2 Testing tool for Bug tracking and Bug reporting-case study of BugZilla 4.3 Testing tool for Test Management- case study of Testlink
Reference Books:	1. Ron Patton "Software Testing", Techmedia Publication, 2000 2. Dr. K.V.K.K prasad, "Software Testing Tools", Dreamtech, 2006 3. Srinivas D and Gopalswamy R, "Software Testing: Principles and Practices". Pearson Education, 2013 4. K. Mustafa and R.A Khan, "Software Testing -concepts and practices", Narosa, 2012 5. Bill Hamilton, "NUnit: pocket Referance", SDP-OReilly, , 2004 6. Andrew Hunt and David Thomus, "Pragmatic Unit Testing in Java with JUnit", SPD, 2006
Teaching Methodology	Discussion, Seminars and Assignment
Evaluation Method	30% Internal assessment and 70% assessment is based on end semester written examination.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-VI
Effective From: JANUARY 2017
Course: 604: Java Programming - II

Course Code	**604**
Course Title	**Java Programming – II**
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	To teach advanced object oriented programming concepts through programming using Java as the computer Programming language.
Course Objective	1. To make students understand object oriented programming. 2. To make students understand various inbuilt java concepts like threads 3. To make students understand the GUInterface and concepts of APPLET. 4. To make students understand various components and their properties.
Pre-requisite	Fundamentals of Object Oriented Programming Language. Knowledge of Core Java.
Course Out come	Students will have knowledge about the Platform independent OOPs language and its concepts. Various features of java like Threads, Applet, various packages like AWT, graphics. Concepts of Swing and JDBC.
Course Content	**Unit 1. Concepts of Thread:** 1.1. Basics of Thread 1.2. Thread Life cycle, working of Thread. 1.3. Creating Thread using Thread class and Runnable Interface. 1.4. Extending, Stopping and Pausing Threads. 1.5 Concepts of Daemon Thread. 1.6 Priority of Thread and Thread scheduling 1.7 Parallel execution of Thread in Synchronous and asynchronous mode. **Unit 2. Applet** 2.1. What is applet. Difference between Applet and Application. 2.2. Life cycle of Applet 2.3. java.applet.Applet class 2.4. Invoking Applet, Passing parameters to Applet 2.5. AWT class: 2.5.1 Component Class: Container, Panel, LayoutManager, Canvas. 2.5.2 Paint method and coordinate system of Applet. 2.5.3 Drawing various objects and shapes like line, circle, ellipse, polygons, arcs, rectangles. 2.5.4 Frame and Dialog. 2.5.4 Displaying images. **Unit 3. Applet Component and event Handling:** 3.1.Lables, TextFields, CheckBoxes, RadioButtons, 3.2 ChoiceList, ChoiceMenu , List 3.3 ScrollBar, StatusBar, Using Thread in Applet.

	3.4 Event Handling: 3.4.1 Handling Button, CheckBox, Radio Button Events 3.4.2 Handling Combobox, List, Scrollbar, TextField, TextArea Events. 3.4.3 Mouse and Keyboard Events. 3.3. Events to scroll texts and generation of Banners. **Unit-4: Java Swing and JDBC:** 4.1. Introduction and Features of Java Swing. 4.2 Swing class Hierarchy 4.2.1 Swing Components and their relevant methods: JText, JComboBox, JLabel, JList, JMenuBar, JOptionFrame, JPanel, JScrollBar, JButton 4.2.3 Layout Manager: BorderLayout, GridLayout, GridBagLayout 4.3 JDBC Architecuture 4.3.1 JDBC:ODBC Bridge Driver 4.3.2 JDBC API classes and Interfaces 4.3.3 JDBC connectivity with Database, Creating DSN. 4.3.4 Performing Insert, Update, Delete and Select operations with Database
References Books:	1.The Complete Reference Java2 Herbert Schildt TMH, New Delhi 2. Mastering JAVA2 John Zukowski BPB 3. Teach Yourself Java2 platform in 21 days Lamey & Cadenhead Teach Media 4 Java in Nut shell - O'Relly Publication 5 Java Language Reference - O'Relly Publication

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-VI
Effective From: JANUARY 2017
Course: 605: Fundamentals of Mobile Computing

Course Code	605
Course Title	Fundamentals of Mobile Computing
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	Implementation from June, 2016
Purpose of Course	To introduce the most demanding and developing mobile app technology. Fundamentals of android open source technology.
Course Objective	1. To make students understand fundamentals of mobile app technology. 2. To make students understand various inbuilt features of android. 3. To make students understand the android design essentials. 4. To make students understand android user interface design basics .
Pre-requisite	Fundamentals of web technologies and fundamentals related to mobile OS.
Course Out come	Students will have knowledge about android which is widely used Mobile OS and opensource technology and its concepts. Various features of android like Application Design Essentials, User Interface Design Essentials, Use of Common Android APIs, data storage using SQLite and deploying Android application.
Course Content	**Unit-1 :** 1. Introduction to Android 1.1 History of Mobile Software Development 1.2 The Open Handset Alliance 1.3 The Android Platform 1.4 Android SDK 1.5 Building a sample Android application **Unit-2 :** 2. Android Application Design Essentials 1.1 Android Life Cycle 1.2 Android terminologies 1.3 Application Context, Activities Intents. 1.4 Android Manifest File and its common settings 1.5 Using Intent Filter, Permissions 1.6 Resource Management in Android. **Unit-3 :** 3. Android User Interface Design Essentials 3.1 User Interface Screen elements 3.2 Designing User Interfaces with Layouts 3.2.1 Relative Layouts 3.2.2 Linear Layouts 3.2.3 Table Layouts

	Unit-4 : 4. Using Common Android APIs 4.1 Using Android Preference 4.2 Managing data using SQLite 4.3 Using Android Networking APIs 4.4 Using Android Web APIs 5. Deploying Android Application 5.1 Selling your Android application 5.2 Signing Android apk with keystore 5.3 Publishing apk to google play store.
References Books:	1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011) 2. http://developer.android.com/ **3.**Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd (2011) 4.Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd(2009) 5.Sayed Y Hashimi and Satya Komatineni, "Pro Android", Wiley India Pvt Ltd(2009)

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-VI
Effective From: JANUARY 2017
Course: 606: Operating System - II

Course Code	506
Course Title	Operating System – II
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	This course imparts the knowledge of operating system concepts
Course Objective	Provide fundamental principles of operating systems design of memory, process management and its relevant Unix concepts
Pre-requisite	-
Course Out come	Get the basic knowledge of operating system concepts, Unix structure and file system commands
Course Content	**1. Memory Management** 1.1. Memory Management Functions 1.2. Contiguous Allocation 1.2.1 Partitioned Memory Static and Dynamic allocation 1.2.2 Segmentation 1.3. Non-contiguous Allocation 1.3.1. Paging Segmentation 1.3.2. Demand Paging and Segmentation 1.3.3. Allocation and Replacement Policies **2. Process Management** 2.1 Process Management 2.2 Process Concept 2.3 Scheduling 2.4 Scheduling Algorithms 2.5 Process co-ordination 2.5.1. Producer/ consumer Problem 2.5.2. Critical Section Problem 2.5.3. Semaphores 2.5.4. Inter Process Communication 2.6 Deadlocks 2.6.1. Overview of Deadlock Avoidance 2.6.2. Overview of Deadlock Prevention 2.6.3 Overview of Deadlock Recovery **3. Structure of Process in Unix** 3.1 Inodes 3.2 Structure of a Regular File 3.3 Directories 3.4 Process State and Transition

	3.5 Layout of System Memory 3.6 overview of Process Address Space **4. Working with Unix Commands** 4.1 Memory Management - Shmget, Shmat, Shmdt, Shmctl, Plock 4.2 Process Commands - Fork, Wait, Brk, Sbrk, Exec, Nice, Times, getpid, Kill, Pause 4.3 IPC Commands – Pipe, Ptrace, Profile, msgget, msgsnd, msgrev, msgctl 4.4 Semaphore Commands – Semget, Semop, Semctl, Signal
Reference Books	1. Operating System Concepts, James Peterson McGrawHill 2. An OS Concept ,Silberschatz AdditionWesley Publication 3. An Operating Systems, W.Stallings Pearson Education 4. Understanding Operating Systems, I.M.Flinn, A.M. Mchoes – Thomson Learning 5. Operating Systems, Donovan M McGrawHill Publication 6. Operating Systems: A Design Oriented Approach, Crowley TataMcGrawHill Publication 7. Operating Systems, S. Godbole TMH. 8. OperatingSystems: Designand Implementation, Tanenbaum & Woodhull 9. The Design of the Unix Operating System, Maurice J. Bach PHI

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-VI
Effective From: JANUARY 2017
Course: 607-1 : Software Quality Assurance

Course Code	**607-1 GENERIC ELECTIVE (IDS)**
Course Title	**Software Quality Assurance**
Credit	2
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	This course imparts the knowledge of software Quality its factors & Models along with it gives knowledge of Reviews & Audits and Statistical Quality Assurance and Metrics
Course Objective	To have awareness of software Quality its factors & Models along with it awareness about Reviews & Audits and Statistical Quality Assurance ,Quality Assurance Standards and Metrics
Pre-requisite	Basic Idea of Software Engineering & Software Development Life Cycle.
Course Out come	Student should have awareness of what software Quality assurance is and its factors & Models along with students should have awareness about Reviews & Audits and Statistical Quality Assurance ,Quality Assurance Standards and Metrics etc.
Course Content	**1 Introduction to Software Quality & Quality Assurance** **1.1** Definition of Quality & Software Quality **1.2** Quality Factors & Models **1.3** Quality Control & Assurance **2 Software Quality Assurance** **2.1** SQA & its Activities **2.2** Software Reviews & Audits **2.2.1** Defect identification & removal **2.2.2** Formal technical reviews—Guidelines for meeting & record keeping **2.2.3** Requirement Reviews **2.2.4** Design Reviews **2.2.5** Code Reviews **3** Introduction to Statistical Quality Assurance **3.1** Quality Assurance Standards **3.2** Overview: ISO 9000 , 9001:2000 and 9001:2008,CMM & CMMi. **4 Technical Metrics for Quality Measurement** **4.1** Metrics & Measurements and Measurement Principals **4.2** Attributes of Effective Software Metrics

	4.3 Overview of Project, Product & process related metrics **4.4** Metrics for Analysis model **4.4.1** Function based metrics **4.4.2** Bang metrics **4.5** Metrics for design model **4.5.1** High level Design Metrics **4.5.2** Component Level Design Metrics **4.6** Metrics for Source Code, Testing & Maintenance **4.7** Software Reliability & its Measurement
Reference Books:	1. Software Engineering: A Practitioner's Approach, 4e/5e, Roger S. Pressmann , McGrawHill Publication. 2. Software Quality for Producing Practical and Consistent Software , Mordechai Ben-Monachem, Gray S. Marliss , Thomson Learning 3. Software Quality Assurance , Milind Limaye , McGraw Hill. 4. CMM in Practice , Pankaj Jalote , Pearson Education 5. ISO 9001:2000 for software organizations, Swapna Kishor, Rajesh Naik, Tata McGrawHill. 6. Software Engineering , K. K. Aggrawal, Yogesh Singh , New Age International Publishers. 7. Fundamentals of Software Engineering , carlo Ghezzi, Mehdi Jazayeri, Dino Mendrilo , PHI 8. Software Engineering , Ian Summwerville, Addison Wesley , Pearson Education 9. Software Engineering , K. L. James , PHI

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-VI
Effective From: JANUARY 2017
Course: 607-2 : ORGANIZATION STRUCTURE & BEHAVIOUR

Course Code	**607-2 GENERIC ELECTIVE (IDS)**
Course Title	**ORGANIZATION STRUCTURE & BEHAVIOUR**
Credit	2
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	To make students aware about the Structure of an Organization and also provide them teaching that leads to better understanding of human behaviour in an organization.
Course Objective	To Give idea of Organization and its Structure and need of Management in organization and factors like Attitude , Motivation & leadership
Pre-requisite	Basic Communication Skills
Course Out come	After completion of this course student will be about the Structure of an Organization and get idea that leads to better understanding of human behaviour in an organization along with it students will have idea about BPO and call centers.
Course Content	**1. Introduction to Organization** **1.1.** What makes an organization **1.2.** Structure of organization **1.3.** What is Management **1.4.** Scope of Management **2. Need for Management** **2.1.** Role of Management **2.2.** Manager's Role (Interpersonal Role, Information Role and Decisional Role) **2.3.** Managerial Skills (Technical Skills, Human Skills, Conceptual Skills) **3. Attitude , Motivation & Leadership** **3.1.** Meaning of Attitudes **3.2.** Characteristics of Attitudes **3.3.** What is motivation? **3.4.** Nature and Characteristics of Motivation **3.5.** Importance & Benefits of Motivation **3.6.** What is Leadership? **3.7.** Characteristics of Leadership **3.8.** Leadership Styles **3.9.** Leadership Skills (Technical Skills, Human Skills, Conceptual Skills. Personal Skills) **4. BPO & Call Center** **4.1.** What is B.P.O? **4.2.** What is out-sourcing? Benefits of outsourcing

	4.3. What is Call Center? **4.4.** Call center setup & functions
Reference Books:	1. Management & Organization Development , Ahmed Abod Rachna Prakashan, New Delhi 2. Organization Behaviour , Aplewhite Philip , Prentice hall 3. Management & Organization Development , Argyris Chris , McGraw Hill 4. Human Behaviour at work , Davis Keeth , Tata McGraw Hill 5. Organization Behaviour , L.M. Prasad

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T Y B. Sc. (Computer Science)
Syllabus for T. Y. B. Sc. Semester-VI
Effective From: JANUARY 2017
Course: 607-3 INFORMATION SYSTEMS

Course Code	**607-3 GENERIC ELECTIVE (IDS)**
Course Title	**INFORMATION SYSTEMS**
Credit	2
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2013
Purpose of Course	Make students aware and understand various types of Information Systems.
Course Objective	1. Learn the different types of Information Systems. 2. To emphasize on the application of information to business management.
Pre-requisite	NIL
Course Out come	After completion of the course the students will understand and appreciate the basic concepts of Information System, importance of MIS for an organization and understand Transaction processing systems and its types.
Course Content	**1. Introduction** **1.1**. Data & Information **1.2**. Information need and benefits **1.3**. Input, Processing , Output and feedback **2. Concepts of Systems** **2.1**. Definition of system in an organization **2.2**. Types of systems. **2.3** Business as an information system **3. Introduction to various Information Systems** **3.1**. Business information Systems **3.1.1.** ERP **3.2.** Management Information Systems **3.2.1.** Characteristics of MIS **3.2.2.** Development process of MIS **3.3.** Decision support systems and GDSS. **4. Transaction Processing Systems** **4.1.** Overview of Transaction Processing System **4.2.** Transaction Processing methods & objectives **4.3.** Transaction Processing Activities **4.4.** Traditional transaction processing Applications **4.4.1.** Order Processing Systems **4.4.2.** Purchase Systems **4.4.3.** Accounting Systems
Reference Books:	1. Principles of information system , Ralf M. Stair & George W.Reynolds , Thomson LearningPublisher 2. Management information Systems– Text & Applications , CVS Murthy , HPH 3. Management information Systems Organization and technology – Forth Edition , K.C.Laudan & J.P. Laudan , Prentice Hall India 4. Management information system , W.S.Jawadekar , Tata McGraw Hill