GOVT. COLLEGE OF ENGINEERING, AMRAVATI

B. TECH. (Information Technology)
V and VI Semester
CURRICULUM (REVISED)
Department of Information Technology
2012-13

GOVERNMENT COLLEGE OF ENGINEERING, AMRAVTI.
Department of Information Technology.
Proposed Scheme for B. Tech. (Information Technology)

SEM III

Course Code	Name of the Course	Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	Credits
		Teaching Scheme				**Evaluation Scheme**							
						Theory				**Practical**			
SHU304	Engineering Mathematics-III	3	--	---	3	10	15	15	60	---	---	100	3
ETU311	Electronic Devices and Circuits	3	---	---	3	10	15	15	60	---	---	100	3
CSU301	Programming Methodology	3	1	---	4	10	15	15	60	---	---	100	4
ITU301	Communication Engineering	3	1	---	4	10	15	15	60	---	---	100	4
CSU303	Discrete Mathematics and Graph Theory	3	---	---	3	10	15	15	60	---	---	100	3
SHU305	General Proficiency II	1	---	2	3	---	---	---	---	25	25	50	2
ETU312	Electronic Devices and Circuits Lab	---	---	2	2	---	---	---	---	50	---	50	1
CSU304	Programming Methodology Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU302	Communication Engineering Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU306	System administration-I Lab	---	---	2	2	---	---	---	---	25	25	50	1
	Total	**16**	**2**	**10**	**28**	**---**	**75**	**75**	**300**	**150**	**100**	**750**	**23**

SEM IV

Course Code	Name of the Course	Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	Credits
		Teaching Scheme				**Evaluation Scheme**							
						Theory				**Practical**			
CSU401	Numerical Method and Computer Programming	3	--	---	3	10	15	15	60	---	---	100	3
CSU402	Data Structure	3	1	---	4	10	15	15	60	---	---	100	4
CSU403	Object Oriented Technology	3	1	---	4	10	15	15	60	---	---	100	4
ITU401	Digital Integrated Circuits	3	---	---	3	10	15	15	60	---	---	100	3
ITU 402	Data Communication	3	---	---	3	10	15	15	60	---	---	100	3
CSU404	Data Structure Lab	1	---	2	3					50	-	50	2
ITU403	Data Communication Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU405	Object Oriented Technology Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU404	Digital Integrated Circuits Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU406	System administration-II Lab	---	---	2	2	---	---	---	---	25	25	50	1
	Total	**16**	**2**	**10**	**28**	**50**	**75**	**75**	**300**	**150**	**100**	**750**	**23**

TA :Teacher Assessment　　　**CT: Class Tests**　　　**ESE: End Semester Examination**　　　**ICA : Internal Continuous Assessment**

Department of Information Technology
Proposed Scheme for B. Tech. (Information Technology)
SEM V

Course Code	Name of the Course	Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	Credits
		Teaching Scheme				**Evaluation Scheme**							
						Theory				**Practical**			
ITU501	System Analysis and Design	3		---	3	10	15	15	60	---	---	100	3
ITU502	Database Management System	3	---	---	3	10	15	15	60	---	---	100	3
CSU501	System Programming	3	---	---	3	10	15	15	60	---	---	100	3
CSU502	Theory of Computation	3	---	---	3	10	15	15	60	---	---	100	3
CSU503	Principles of Management	3	---	---	3	10	15	15	60	---	---	100	3
ITU503	System Analysis and Design Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU504	Database Management System Lab	---	---	2	2	---	---	---	---	25	---	25	1
CSU504	System Programming Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU505	Hardware Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU505	System Administration-III Lab	1	---	2	3	---	---	---	---	25	25	50	2
ITU506	Self Study I	---	---	----	---	25	---	---	---	---	---	25	2
	Total	**16**		**10**	**26**	**75**	**75**	**75**	**300**	**125**	**100**	**750**	**23**

Note1: Self study I is based on one class test each on the basis of 20% curriculum of the courses ITU501,ITU502,CSU501,CSU502 declared by respective course coordinator at the beginning of semester. One faculty member shall be appointed as course coordinator for self study I and his/her teaching work load shall be considered as one hour per week.

SEM VI

Course Code	Name of the Course	Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	Credits
		Teaching Scheme				**Evaluation Scheme**							
						Theory				**Practical**			
ITU601	Design and Analysis of Algorithms	3	--	---	3	10	15	15	60	---	---	100	3
ITU602	Web Technology	3	---	---	3	10	15	15	60	---	---	100	3
CSU602	Operating System Design	3	---	---	3	10	15	15	60	---	---	100	3
CSU603	Computer Network	3	---	---	3	10	15	15	60	---	---	100	3
ITU603	E-Commerce	3	---	---	3	10	15	15	60	---	---	100	3
ITU604	Design & Analysis of Algorithms Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU605	Web Technology Lab	---	---	2	2	---	---	---	---	25	---	25	1
CSU606	Operating System Design Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU607	Computer Network Lab	---	---	2	2					25	25	50	1
ITU606	Minor Project	----	----	2	2	---	----	---	----	25	25	50	2
ITU607	Self Study II	---	---	----	---	25	---	---	---	---	---	25	2
ITU608	Industrial Lecture I*	1	---	----	1	---	---	---	---	---	---	---	---
	Total	**16**		**10**	**26**	**75**	**75**	**75**	**300**	**125**	**100**	**750**	**23**

Note2: Self study II is based on one class test each on the basis of 20% curriculum of the courses ITU601,ITU602,CSU602,CSU603 declared by respective course coordinator at the beginning of semester. One faculty member shall be appointed as course coordinator for self study II and his/her teaching work load shall be considered as one hour per week.

TA :Teacher Assessment   CT: Class Tests   ESE: End Semester Examination   ICA : Internal Continuous Assessment

GOVERNMENT COLLEGE OF ENGINEERING, AMRAVTI.

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Proposed Scheme for B. Tech. (Information Technology)

SEM VII

Course Code	Name of the Course	Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	Credits
ITU701	Compiler Construction	3	---		3	10	15	15	60	---	---	100	3
ITU702	Microprocessor and Interfacing	3	---		3	10	15	15	60	---	---	100	3
ITU703	Elective -I	3	---		3	10	15	15	60	---	---	100	3
ITU704	Interdisciplinary Elective	3	---		3	10	15	15	60	---	---	100	3
ITU705	Compiler Construction Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU706	Microprocessor and Interfacing Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU707	Elective-I Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU708	Project phase -I	---	---	4	4	---	---	---	---	50	--	50	2
ITU709	Seminar	---	---	2	2	---	---	---	---	25	25	50	2
ITU710	Industrial Visit	---	---	---	---	---	---	---	---	50	---	50	1
ITU711	Industrial Lecture II*	1	---		1	---	---	---	---	25	---	25	1
ITU712	Self Study III	---	---	---	----	25	---	---	---	---	---	25	2
	Total	13	---	12	25	65	60	60	240	225	100	750	23

*Note4: Credit shall be awarded on the basis of combined assessment of Industrial Lecture I & Industrial Lecture II

Note5: Self study III is based on one class test each on the basis of 20% curriculum of the courses ITU701, ITU702, ITU703 declared by respective course coordinator at the beginning of semester. One faculty member shall be appointed as course coordinator for self study III and his/her teaching work load shall be considered as one hour per week.

SEM VIII

Course Code	Name of the Course	Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	Credits
ITU801	Data Warehousing and Data Mining	3			3	10	15	15	60			100	3
ITU802	Network Administration & Security	3	---	---	3	10	15	15	60	---	---	100	3
ITU803	Elective-II**	3	---	---	3	10	15	15	60	---	---	100	3
ITU804	Elective-III***	3	---	---	3	10	15	15	60	---	---	100	3
ITU805	Data Warehousing and Data Mining Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU806	Network Administration & Security Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU807	Elective-II ** Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU808	Project	---	---	6	6	---	---	---	---	75	100	175	6
ITU809	Self Study IV	---	---	---	---	25	---	---	---	---	----	25	2
	Total	12		12	24	65	60	60	240	150	175	750	23

Note6: Self study IV is based on one class test each on the basis of 20% curriculum of the courses ITU801,ITU802 ,ITU803,ITU804 declared by respective course coordinator at the beginning of semester. One faculty member shall be appointed as course coordinator for self study IV and his/her teaching work load shall be considered as one hour per week.

Note7: Students of this department shall select any one Interdisciplinary Elective offered by other department. Interdisciplinary Elective shown below will be offered to students of other department.

TA :Teacher Assessment   CT: Class Tests   ESE: End Semester Examination   ICA : Internal Continuous Assessment

Elective I ITU703	Interdisciplinary Elective ITU704	Elective II ITU803	Elective III CSU804
A Distributed computing	A Computer Oriented Operation Research	A Artificial Neural Network	A Artificial Intelligence
B Optical Satellite and Communication	B Nanotechnology	B Advanced Web Technology	B Natural Language Processing
C Digital Signal Processing	C Software Engineering	C Software Planning & Management with Object Oriented Approach System	C Functional and Logic Programming
D Embedded System	D Introduction to Systems Engineering	D Computer Graphics	D Parallel Computing
E Bio-Informatics		E Digital Image Processing	E High Performance Network
F Multimedia Technology			

ITU501 SYSTEM ANALYSIS AND DESIGN

Teaching Scheme: 03 L+00T   **Total-03**   **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60ESE   **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Introduction : System Analysis & Design concepts, Role of system analyst, Review of SDLC, Organization as systems, Levels of management culture, Project fundamentals, Feasibility study, Activity planning & control, Managing analysis & design activities, Sampling and investigating hard data, Interviewing, Planning & conducting interview & reporting, Joint application design, using questionnaires, Planning, designing and administering the questionnaire.

Conservation of a decision-makers behaviour and office environment Prototyping: User Reactions, Approaches to prototyping & developing prototype, Data flow approach to requirements, developing DFDs, Logical & Physical DFDs, examples of DFDs, data dictionary concept, data repository, creating & using data dictionary.

Overview of process specifications: Structured English, decision tables/trees, decision support system & decision making concepts relevant to DSS, semi structured decisions, Multiple-criteria decision-making.

System Proposal: Ascertaining hardware/software needs, Identifying & forecasting cost/benefit & comparing cost/benefit, Writing and presenting the systems proposals, Principles of delivery, output design objectives, designing printed output, screen output, Input design objectives, form design, screen design for input.

Introduction to OOSAD : Object-oriented Analysis, object-oriented design.

Text-Book:

1. System Analysis and Design, Kenneth E. Kendall & Julie E.Kendal, 5th Edition, Prentice Hall, 2005.
2. System Analysis & Design, Yeates, 2nd edition, Pearson publication, 2004

Reference Books:

1. Fundamentals of System Analysis & Design J.Fitgerald & A.Fitgerald ,3rd Edition, John Wiley Publication, 1987.
2. www.nptel.iitm.ac.in

ITU502 DATABASE MANAGEMENT SYSTEM

Teaching Scheme: 03 L+00T   **Total - 03**   **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE   **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Introduction: Database System Applications, Database Systems versus File Systems, View of Data, Data Models, Database Languages, Database Users and Administrators, Transaction Management, Database System Structure, Application architectures, History of Database Systems. Entity-Relationship Model, Basic Concepts, Constraints, Keys, Design Issues, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R Features, Design of an E-R Database Schema, Reduction of an E-R Schema to Tables.

Relational Model: Structure of Relational Databases, The Relational Algebra, Extended Relational-Algebra Operations, Modification of the Database, Views, SQL: Basic Structure, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Views.

Integrity and Security, Domain Constraints, Referential Integrity, Assertions, Triggers, Security and Authorization, Authorization in SQL, Encryption and Authentication, Relational-Database Design: First Normal Form, Pitfalls in Relational-Database, Design, Functional Dependencies, Decomposition, BCNF, Third, Fourth and more Normal Forms, Overall Database Design Process. Storage Structures: B Tree, B+ Trees, Heap organized table, Index Organized tables.

Query Processing: Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Other Operations, Query Optimization, Materialized Views.

Transaction management: Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Execution, Serializability, Recoverability, Implementation of Isolation, Transaction Definition in SQL, Testing for Serializability. Concurrency Control: Lock-Based Protocols, Timestamp-Based Protocols, Validation- Based Protocols, Multiple Granularity, Multiversion Schemes, Deadlock Handling, Insert and Delete Operations, Weak Levels of Consistency, Concurrency in Index Structures, Recovery System, issues & solutions.

Text Book:
1. Database System Concept , Korth , Sudarshan ,4th Edition, Mc Graw Hill Publication, 1997.
2. Fundamentals of Database Systems, Elmasri, Navathe, 3rd Edition, Pearson Education, 2004.

Reference Books:
1. Database system, Raghu Ramkrishnan, 3rd Edition, McGraw-Hill Publication ,2003.
2. Database System, Connolly & Begg, 3rd Edition, Low Price Ed. Addison Wesley publication, 2005.
3. www.nptel.iitm.ac.in

CSU501 SYSTEM PROGRAMMING
Teaching Scheme: 03 L+00T   **Total-03**   **Credits: 03**
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE   **Total Marks: 100**
Duration of ESE: 2hrs.30min.

Evaluation of components of programming system: assemblers, loaders, macros, compilers. Evaluation of operating system, functions of batch control language, facilities, machine structure, machine language, assembly language

Design of assemblers: pass1, pass 2 algorithms, symbol table construction & processing searching & sorting. Microinstructions, features of macro facility, implementation of single & two pass algorithms, macro calls within macros.

Linker and Loader: Concept of static and dynamic relocation, external symbol, design of linker, design of object file for different loading scheme.

Compilers: compiler, general model of a compiler, Introduction to. Various phases of compiler.

Type checking: Type system, type expressions, structural and name equivalence of types, type conversion, overloaded functions and operators, polymorphic functions.

Run time system: Storage organization, activation tree, activation record, parameter passing symbol table, dynamic storage allocation.

Feature of HLL: functional modularity, asynchronous operation, multitasking.

Text Books:
1. System programming, J.J.Donovan, 1st Edition, Tata McGraw Hill, 2000.
2. Introduction to Systems Software, Dhamdhere, D.M., 1st Edition, Tata Mc-Graw Hill 1996.

Reference Books
1. Compilers: Principles, Techniques, and Tools, Alfred V Aho, Ravi Sethi, Jeffrey D Ulman, 1st Edition ,Addison Wesley Publication,1986

CSU502 THEORY OF COMPUTATION

Teaching Scheme: 03 L+00T   **Total-03**   **Credits: 03**
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE   **Total Marks: 100**
Duration of ESE: 2hrs.30min.

Finite Automata: Alphabet, Language, Operations, Finite state machine, definitions, Finite automation model, Acceptance of strings and languages. Non deterministic finite automation, deterministic finite automation, equivalence between NFA and DFA, Conversion of NFA into DFA, minimization of FSM, equivalence between two FSM's, Moore and Mealy machines.

Regular expressions: Regular sets, regular expressions, identity rules, Manipulation of regular expressions, equivalence between RE and FA, Inter conversion, pumping lemma, Closure properties of regular sets.

Regular grammars: right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion between RE and RG Context free grammar, derivation trees, Chomsky normal form, Greibach normal form, push down automata, definition, model, acceptance of CFL, equivalence of CFL and PDA, interconversion, enumeration of properties of CFL .

Turing machine: Definition, model, design of TM, computable functions, recursive enumerable language, Church's hypothesis, counter machine, types of TM's, Chomsky hierarchy of languages, linear bounded automata and context sensitive language, introduction of DCFL and DPDA, LR (O), grammar, decidability of problems.

Undecidability: properties of recursive & non-recursive enumerable languages, universal Turing machine, post-correspondence problem, introduction to recursive function theory.

Text Books :
1. Introduction to Automata Theory, Languages and Computation , John E. Hopcroft,Rajeev Motwani, Jeffrey D.Ullman ,3rd Edition, Addison-Wesley Publishing Co.,2007.
2. An Introduction to Formal Languages and Automata by Peter Linz,4th Edition, Jones & Bartlett Publication, 2006 .

Reference Books:
1. Introduction to Languages and the Theory of Automata, John C.Martin,2nd Edition, McGraw- Hill Publication, 2003.
2. Elements of Theory of Computation , Lewis H.P. and Papadimition C.H. ,2nd Edition, Prentice Hall Publication, 1997.
3. www.nptel.iitm.ac.in

CSU503 PRINCIPLES OF MANAGEMENT

Teaching Scheme: 03 L+00T   Total 03   Credits: 03
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE   Total Marks: 100
Duration of ESE: 2hrs.30min.

Introduction: Definition and concepts of management Importance of management, Various management functions, Roles of manager, Skill mix at different management level, Human resources planning, Trade unions & collective bargaining.

Organization planning, design and development: Production resources, Production planning, types of production system, production systems, production control.

Product design & development: Introduction, design of the product, new product Development, Material planning and control. Inventory control technique.

Maintenance and system reliability: Concepts and Objectives of maintenance. Failure analysis, Reliability Maintenance system & Classification. Maintenance planning, TQM, ISO 9000 and Quality audit.

Marketing management: Introduction, marketing planning. Consumer behavior, product management, Pricing & promotion decision. Financial planning. Source of finance.

Project Management: Concepts and importance of project, Project implementation, MIS.MIS meaning and objectives. Types of data, methods of data collection, analysis and presentation of data. Editing, reporting and presentation of data.

Text Book:

1) Management of Systems, A.K.Gupta, 1st Edition, J.K. Sharma, Macmillan India, 2003.
2) Modern Business Administration, Apple, 6th Edition, Macmillan India,2003.

Reference Book:
1) Principles of Management, Tripathy & Reddy, 2nd Edition, Tata McGraw Hill,2004.
2) Principles of Practices of Management, Gupta, Sharma, Kalyani, 1st Edition, 2002.

ITU503 SYSTEM ANALYSIS AND DESIGN LAB

Teaching Scheme: 02 P   **Total 02**   **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE   **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum eight experiments shall be performed to cover entire curriculum of ITU501 (System Analysis and Design) and the list given is just a guideline.
Consider an example system to implement all the concepts of SAD and perform following practicals.
1. Write an experiment to Create Database & Connect it with Front-end.
2. Write an experiment to Create student information system. Add Following button on form –
   1) add 2) delete 3) edit 4) exit.
3. Write an experiment to create student-grading system using the following controls on the form- 1.combo box 2.list box.
4. Create online registration form for taking admission in different courses.
5. Write an experiment to Create online examination system using check box & option box & option button.
6. Write an experiment to prepare Mark Sheet using reports.
7. Write an experiment to Create Leaving Certificate.
8. Write an experiment for Hostel Information System.
9. Design the Component diagram for anyone Information System.
10. Design the Class diagram for anyone Information System.

ICA – The Internal Continuous Assessment shall be based on practical record and knowledge or skills acquired. The performance shall be assessed experiment wise by using continuous assessment format, A & B.

ESE- The End Semester Exam for Practical shall be based on performance in one of the experiments and may be followed by sample questions.

ITU504 DATABASE MANAGEMENT SYSTEM LAB

Teaching Scheme: 02 P   **Total 02**   **Credit: 01**
Evaluation Scheme: 25 ICA   **Total Marks: 25**

The sample list of programs based on ORACLE or MY SQL is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.
1. Consider the employee database, Write the Queries using following database.
Employee (employee-name, street, city)
Works (employee-name, company-name, salary)
Company (company-name, city)
Manages(employee-name, manager-name)
2. Consider the above database & perform the different Join Operations.
3. Consider the above database & perform the different Set Operations.
4. Consider the above database & perform the all Aggregate Functions.

5. To write a PL/SQL block for inserting rows into EMPDET table.
6. Write a PL/SQL program which populates employee database mentioned in practical 1 with N random rows.
7. Write an assertion for the bank database to ensure that the assets value for the 'perryridge' branch is equal to the sum of all amountslent by the 'perryridge' branch.
Customer (customer-name, customer-street, customer-city)
Branch (branch-name, branch-city, assets)
 Loan (loan-number, branch-name, amount)
Borrower (customer-name, loan-number)
Depositor (customer-name, account-number)
Account (account-number, branch-name, balance)
8. Write an SQL trigger to carry out the following action: On delete of an account, for each owner of the account, check if the owner has any remaining accounts, and if she does not, delete her from the depositor relation.
9. Consider the above Bank database & write the SQL queries for the different views.
10. Write PL/SQL program which counts number of rows of each table using dynamic SQL.
12. Mini Project Using Oracle 9i.

ICA – The Internal Continuous Assessment shall be based on practical record and knowledge or skills acquired. The performance shall be assessed experiment wise by using continuous assessment format, A & B.

CSU504 SYSTEM PROGRAMMING LAB

Teaching Scheme: 02 P   **Total 02**   **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE   **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum eight experiments shall be performed to cover entire curriculum of CSU501 (System Programming) and the list given is just a guideline.
   1. Write a program to generate Machine Op-Code Table, Symbol Table and Pseudo Op-Code table during First Pass Assembler.
   2. Write a program to generate Machine Op- code table using Two pass Assembler.
   3. Write a program to Generate Macro Name Table, Macro definition Table and Argument List Array during Pass One of Two Pass Macro.
   4. Write a program to generate Expanded Source in Pass Two of Two Pass Macro.
   5. Binary files of various types: structure and processing. Maintaining data structures in files (e.g. b-tree, Linux directories), Object and executable files (demonstrated through ELF files). Linking and Loading, Dynamic Loading.
   6. Issues in program development
   7. Debugging programs, and the effect of compound bugs (e.g. various types of memory leaks, compiler bugs). Patching and hacking, Performance analysis, profiling,
   8. Program based on run time linking.
   9. Write a program to generate Expanded Source using one Pass assembler.
   10. Write a program in assembly language for ascending and descending sorting.

ICA – The Internal Continuous Assessment shall be based on practical record and knowledge or skills acquired. The performance shall be assessed experiment wise by using continuous assessment format, A & B.

ESE- The End Semester Exam for Practical shall be based on performance in one of the experiments and may be followed by sample questions.

CSU505 HARDWARE LAB

Teaching Scheme : 02 P	**Total 02**	**Credits : 01**
Evaluation Scheme: 25 ICA + 25 ESE		**Total Marks: 50**
Duration of ESE: 3hrs.		

Minimum eight experiments shall be performed .The sample list of program is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same .Aim of the list is to inform about minimum expected outcomes

1. Identification of various hardware parts of computer.
2. Preventive maintenance of a PC.
3. Partitioning and formatting Hard disks.
4. Installation of Operating System and various application software.
5. Understanding of control panel setting.
6. Fault detection and rectification in SMPS.
7. Fault detection and rectification in motherboard.
8. Configuration of system with local area network.
9. Working with antivirus software
10. Working with Backups and Archival utilities.
11. Installation of server and settings for networking.

ICA – The Internal Continuous Assessment shall be based on practical record and knowledge or skills acquired. The performance shall be assessed experiment wise by using continuous assessment format, A & B.

ESE- The End Semester Exam for Practical shall be based on performance in one of the experiments and may be followed by sample questions.

ITU505 SYSTEM ADMINISTRATION-III LAB

Teaching Scheme: 01L+02 P   Total 03   **Credits: 02**
Evaluation Scheme: 25 ICA + 25 ESE   **Total Marks: 50**
Duration of ESE: 3Hrs.

Minimum eight experiments shall be performed .The sample list of program is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same .Aim of the list is to inform about minimum expected outcomes. Theoretical concepts related to following topics should be covered in theory lectures.

1)Multiboot system
2)IP Addressing
    IP Address Configuration for Linux Boxes
    Sub netting, bonding, Configure NIC with Multiple IP
    Using Different Utility - ping/tcpdump/netstat/nmap
    DHCP Server Configuration
    SAMBA
3)VSFTPD
    XINETD – TCPWRAPPE
    OpenSSH
4)Apache
    Basic Configuration/ Virtual Hosting/ Authentication
    Content Description and Modification
    Indexing /Redirection/ Logging/ Proxying
    Security – Using OpenSSL.
5)NFS
    Server Side NFS Configuration
    Client Side NFS Configuration
    Automation of NFS Server and Client.
    Logging/Security/Failover High Availability of NFS Servers.
6)Squid
    Introduction to SQUID/ CLI Options
    Network Parameters/ Admin Parameters
    Caching/ Access Control List
    Authentication/ Logging
    Transparent Proxy
    Reverse Proxy
    DNS Mapping
9)Squid Guard
10)Dynamic DNSMail – Sendmail
11)SquirrelMail
12)Testing For PHP and MySQL

Text Books:
1. Red Hat Fedora Linux 3, Bible Christopher Negus, 1st Edition, John Wiley Publication 2005.
2. Linux programming, Neil Mathew, Richard stones,4th Edition, John Wiley Publication,2009.

Reference Book:

1. Linux Administration Handbook, Evi Nemeth, Garth nyder, Trent R. Hein,1st Edition, PHI Publication,2003.

ICA – The Internal Continuous Assessment shall be based on practical record and knowledge or skills acquired. The performance shall be assessed experiment wise by using continuous assessment format, A & B.

ESE- The End Semester Exam for Practical shall be based on performance in one of the experiments and may be followed by sample questions.

ITU506 SELF STUDY I

Teaching Scheme: 00 L+00T   **Total-00**   **Credits: 02**
Evaluation Scheme: 25 TA   **Total Marks: 25**

Note1: Self study I is based on one class test each on the basis of 20% curriculum of the courses ITU501,ITU502,CSU501,CSU502 declared by respective course coordinator at the beginning of semester. One faculty member shall be appointed as course coordinator for self study I and his/her teaching work load shall be considered as one hour per week.

ITU601 DESIGN AND ANALYSIS OF ALGORITHMS

Teaching Scheme: 03 L+00T **Total-03** **Credits: 03**
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60ESE **Total Marks: 100**
Duration of ESE: 2hrs.30min.

Algorithms as technology: The role of algorithm in Computing, Introduction to Elementary algorithmic, problem and instances, Efficiency of algorithms, Average and Worst-case analysis, Efficiency considerations, Elementary operations, Asymptotic Notations, Conditional Asymptotic notations.
Analysis of algorithmic: control structure analysis, sequencing, "for" loops, recursive Calls, while and repeat loops, Average case analysis, amortized analysis, Solving Recurrences, Heaps, binomial heaps, disjoint set structures.
Greedy algorithms: general characteristics, Graphs, Minimum spanning trees, Kruskal's Algorithm, Prim's algorithm, Shortest path algorithms, Knapsack problem, Scheduling. Divide and Conquer: Introduction, Multiplying integers, general template, and Binary search. Sorting: Merge sort, Quick sort, Insertion sort, Heap sort, finding median Matrix Multiplication, Exponentiation.
Dynamic programming: binomial coefficients and World Series examples. Principle of Optimality, Knapsack problem, shortest path, chained matrix multiplication.
Exploring Graphs: Traversing trees, DFS for undirected and directed graphs, breadth First search, backtracking, branch and bound, the minimax problem, introduction to NP Completeness: polynomial time, polynomial time verification, NP completeness and Reducibility.

Text Books:
1. Fundamentals of Algorithmic ,G. Brassards, P.Brateley,1st Edition, Prentice Hall of India Publication,2004.
2. Fundamentals of Computer Algorithms, Horowitz and Sahni,3rd Edition, Galgotia Publication, 2006 .

Reference Book:
1. Introduction to Algorithms, Thomas H. Cormen, Leiserson, Rivest, Stein, 2nd Edition, Prentice Hall of India, 2004.
2. www.nptel.iitm.ac.in

ITU602 WEB TECHNOLOGY

Teaching Scheme: 03 L+00T **Total 03** **Credits: 03**
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**
Duration of ESE: 2hrs.30min.

Introduction: History of the Internet and World Wide Web, HTTP, SMTP, POP3, MIME.
Dynamic Web Pages: The need of dynamic web pages, an overview of HTML, DHTML, cascading style sheets (CSS). Active Web Pages: Need of active web pages, Java applet life cycle.
Java Script: Data types, variables, operators, conditional statements, array object, date object, string object.

Java Servlets: Introduction, Advantages over CGI, Servlet life cycle, Servlet API (Different interfaces & classes of generic servlet & HTTP servlet), Accessing user information by means of Request & Response, Servlet session management techniques.

JSP: Introduction, Comparison between JSP & servlet, Architecture/Life cycle, JSP tags, Directives, Scripting elements, JSP implicit objects, Accessing user information using implicit objects.

EJB: Introduction, Comparison of EJB & Java Beans, Applications, Drawbacks, Different types of enterprise beans, Services provided by EJB container.

JDBC: Introduction, Database driver ,Different approaches to connect an application to a database server, Establishing a database connection and executing SQL statements, JDBC prepared statements, JDBC data sources.

XML: Java & XML, XML syntax, Document type definition, Parsers.

Text Books:
1. Inside Servlets, Dustin R Callaway, 3rd Edition, Pearson Education (LPE), 2008.
2. Java Server Pages, Larne Pekowasky, 1st Edition, Pearson Education (LPE), 2008.

Reference Books:
1. Internet & Java Programming, Krishnamoorthy & S. Prabhu, 1st Edition, New Age Publication, 2004.
2. Web Technologies, Godbole & Kahate, 2nd Edition, Tata Mc-Graw Hill, 2008.
3. Internet & World Wide Web, Deitel & Deitel and Nieto, 1st Edition, Perarson Publication, 2000.
4. XML: How to Program, Deitel, Nieto, Lin, Sadhu , 2nd Edition ,Pearson Education, 2007.
5. Professional JAVA Server Programming, Allamaraju & Buest, 1st Edition, Wrox Publication, 2008.
6. www.nptel.iitm.ac.in

CSU602 OPERATING SYSTEM DESIGN

Teaching Scheme: 03 L+00T   **Total-03**   **Credits: 03**
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60ESE   **Total Marks: 100**
Duration of ESE: 2hrs.30min.

Introduction: Introduction and history of Operating systems, types of OS, structure and operations; OS services, system calls processes and files;

Process management: inter process communication, process scheduling and algorithms, critical sections, threads, multithreading;

Process synchronization: semaphores, critical regions**,** mutual exclusion, wait and signal procedures; classical problem of synchronization, critical section problem

Deadlock: Shared resources, resource allocation and scheduling, resource graph models, deadlock detection, deadlock avoidance, deadlock prevention algorithms,

Memory management: contiguous memory allocation, virtual memory, paging, page table structure, demand paging, page replacement policies, thrashing, segmentation, case study;

File management: file concept, types and structures, directory structure, cases studies, access methods and matrices, file security, user authentication; UNIX operating system as a case study.

Case study: Linux system, Design principles, Process management, Memory management, File systems, I/O, Inter process communication, Network structure, Security in Linux.

Text Books:

1. Operating System concepts and principles, A. Silberschatz & P.B. Galvin, 8th Edition, Wiley India, 2009.
2. Modern Operating System, Tanenbaum, 3rd Edition, Prentice Hall India, 2003.

Reference Books:
1. Operating Systems: Internals and design Principle, W. Stallings, Pearson Education, LPE, 6th Edition, 2009.
2. Design of Linux Operating system, M.J. Bach, 3rd Edition, Prentice Hall, 2004.
3. www.nptel.iitm.ac.in

CSU603 COMPUTER NETWORK
Teaching Scheme: 03 L+00T   **Total - 03**   **Credits: 03**
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE   **Total Marks: 100**
Duration of ESE: 2hrs.30min.

Overview of OSI reference model: Topology design, Media Access Control Level, Services, Problems and protocols,
Practical local area network design and implementation: IEEE LAN Standards, Logical Link Control protocols, HDLC, ALOHA, SLOTTED ALOHA, FDDI, Client Server model and related software's.
Network Layer: level services, problems and protocols, WAN, MAN, interconnection networks related software's. TCP/IP, Novel NetWare, Routers, Bridges and Gateways. X.25, Internet and related software's NETSCAPE and MOSAIC.
Transport layer: services, problems and their protocol, Brief functioning of upper layers, E-mail and other application
Text Book:
1. Computer Networking: A top down Approach Featuring the internet, Jim Kurose,Keith Ross,2nd Edition, Addison Wesley,July2002.
2. Data and Computer Communication, William Stallings, 6th Edition, PHI Publication , 2007.
Reference Book :
1. Computer Networks, A.S. Tanenbaum, 4th Edition, PHI Publication,2002.
2. www.nptel.iitm.ac.in

ITU603 E- COMMERCE
Teaching Scheme: 03 L+00T   **Total - 03**   **Credits: 03**
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE   **Total Marks: 100**
Duration of ESE: 2hrs.30min.

Basic web commerce concepts: electronic commerce modes: overview, EDI, electronic commerce with www-internet, commerce net advocacy.
Approach to safe E-commerce: Secure transport protocol and transaction, SEPP,SET, Certificate for authentication, security on web server and enterprise network.

Electronic cash and Electronic payment scheme: Internet monetary payment and security Requirements, Payment & purchase order process, Online Electronic cash.

Needs for computer security: Security strategies, Encryption. MasterCard/visa secure Electronic Transaction: Introduction, requirements and concepts, payment processing.

Secure E-mail Technologies: Introduction, means of distribution, models for message handling, Email working, MIME, S/MIME, moss comparisons of security methods, MIME and Related facilities for EDI over the Internet.

Internet & web site Establishment: Internet Resources for commerce: introduction, Web server Technologies, Internet tools Relevant to commerce, Internet Applications for commerce, Internet Access and Architecture, Internet searching.

Text Books:

1. Web Commerce Technology Hand Book, Daniel Minoli & Emma Minoli, 1st Edition, PHI Publication, 1999.

Reference Books:

1. The E-Commerce book, Steffano Korper and Juanita Ellis, 2nd Edition, Focal press, 2000.
2. The Complete E-Commerce book, Janice Reynolds, 1st Edition, Focal Press, 2004.

ITU604 DESIGN AND ANALYSIS OF ALGORITHMS LAB

Teaching Scheme: 02 P   **Total 02**   **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE   **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum eight experiments shall be performed to cover entire curriculum of ITU601 (Design and Analysis of Algorithms) and the list given is just a guideline.

1. Apply Heap sort technique on a given set of elements.
2. Develop a simulator for a given set of elements using Merge sort technique / Selection sort technique/ Quick sort technique.
3. A disorganized carpenter has a mixed pile of bolts and nuts and would like to find the corresponding pairs of bolts and nuts. Each nut matches exactly one bolt (and vice versa). By trying to match a bolt and a nut the carpenter can see which one is bigger, but she cannot compare two bolts or two nuts directly. Can you help the carpenter match the nuts and bolts quickly?
4. Check whether a graph is connected using Depth first Search technique.
5. Implement 0/1 knapsack problem using memory function dynamic programming.
6. From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm.
7. Implement a minimum cost spanning tree for a given undirected graph using Prim's algorithm or Kruskal's algorithm
8. Print all the nodes reachable from a given starting node in a digraph using Breadth first search technique.
9. Develop a simulator for a pair shortest paths problem using Floyd's algorithm.
10. Design a simulator for n-Queens problem using backtracking technique.

ICA – The Internal Continuous Assessment shall be based on practical record and knowledge or skills acquired. The performance shall be assessed experiment wise by using continuous assessment format, A & B.

ESE- The End Semester Exam for Practical shall be based on performance in one of the experiments and may be followed by sample questions.

ITU605 WEB TECHNOLOGY LAB

Teaching Scheme: 02 P   **Total 02**   **Credit: 01**
Evaluation Scheme: 25 ICA   **Total Marks: 25**

Minimum eight experiments shall be performed to cover entire curriculum of ITU602 (Web Technology) and the list given is just a guideline.
1. Write a simple servlet that will display "Hello World"
2. Write a servlet that uses doGet() and doPost() methods in a single servlet.
3. Write a servlet that receives first name, last name and city name from an html page and puts this data in to cookies provide a hyperlink that can retrieve cookies from the client machine & display.
4. Write a servlet to maintain of state and session with HTTP using rewritten URL's and hidden variables.
5. Introduction to JDBC (Java Database Connectivity).
6. Write a simple servlet to display the information related to students, like student id, student name and his/her age, using JDBC. (Assume student information stored in Microsoft Access database.)
7. Write a servlet that accept banking information like account number, customer name, balance from an html page, and store it into the database, using JDBC (Assume Account table is already created in Microsoft Access database.)
8. Introduction to XML
9. Write an application in XML for representing 'Student Information System'.
10. Write a simple JSP that uses JDBC for accessing information like student name and gender from Microsoft access.
11. Write a bean that receives two numbers and returns result of four basic calculations i.e. addition, subtraction, multiplication and division using JSP beans
12. Mini Project

ICA – The Internal Continuous Assessment shall be based on practical record and knowledge or skills acquired. The performance shall be assessed experiment wise by using continuous assessment format, A & B.

CSU606 OPERATING SYSTEM DESIGN LAB

Teaching Scheme: 02 P	Total 02	Credit: 01

Evaluation Scheme: 25 ICA + 25 ESE   **Total Marks: 50**

Duration of ESE: 3hrs.

Minimum eight experiments shall be performed to cover entire curriculum of CSU602 (Operating System Design) and the list given is just a guideline.

1. Write a program that demonstrates Parent process – Child process Relationship.
2. Simulation of scheduling algorithms: Write a program to implement the following process scheduling algorithms
    1) First Come First Serve
    2) Shortest Remaining Job First
    3) Round Robin
    4) Preemptive Priority Scheduling
3. Implementation of semaphore: Write a program that demonstrates how two processes can Share a variable using semaphore.
4. Producer – Consumer Problem: Write a program to implement producer consumer Problem (Using POSIX semaphores)
5. To implement Banker's algorithm for a multiple resources.
6. Simulate Dinning Philosopher's problem.
7. Simulate all Page Replacement Algorithms a) FIFO b) LRU
8. File management system calls: Write a program to implement
    1. Create a file
    2. Copy one file to another
    3. Linking a file
    4. Delete a file.
9. Write a program to demonstrate interprocess communication.
10. Write a program to simulate bounded buffer problem.

ICA – The Internal Continuous Assessment shall be based on practical record and knowledge or skills acquired. The performance shall be assessed experiment wise by using continuous assessment format, A & B.

ESE- The End Semester Exam for Practical shall be based on performance in one of the experiments and may be followed by sample questions.

CSU607 COMPUTER NETWORK LAB

Teaching Scheme: 02 P   **Total 02**   **Credits: 01**
Evaluation Scheme: ICA 25+ ESE 25   **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum eight experiments shall be performed to cover entire curriculum of CSU603 (Computer Network) and the list given is just a guideline.
1. Write a program to find internet address of remote computer.
2. Testing the characteristics of an IP address.
3. Write a program to trace the port of a particular host.
4. Write a program to implement the daytime protocol.
5. Write a program to implement the echo client.
6. Write a program to implement the finger client.
7. Write a program to implement the who is client.
8. Demonstration of TCP/IP protocol.
9. Demonstration of UDP protocol.
10. Implement a chat server using TCP/IP protocol.
11. Implementation of DNS Server
12. Implementation of IIS and Apache Server and web hosting
13. Implementation of Telnet, FTP
14. Proxy server setting
15. Sub-netting, Gateway Setting, DHCP configuration

ICA – The Internal Continuous Assessment shall be based on practical record and knowledge or skills acquired. The performance shall be assessed experiment wise by using continuous assessment format, A & B.

ESE- The End Semester Exam for Practical shall be based on performance in one of the experiments and may be followed by sample questions.

ITU606 MINOR PROJECT

Teaching Scheme: 02P   **Total 02**   **Credit : 02**
Evaluation Scheme : 25 ICA+ 25ESE   **Total Marks : 50**
Duration of ESE: 3hrs.

Minor Project based on following topics, Each batch consist of maximum 2-3 students.
   1. Web server.
   2. DNS Server.
   3. Database connectivity.
   4. Client-server Architecture.
   5. Networking.
   6. Data mining and Data Ware housing.
   7. Proxy Server.
   8. Mail Server.

ICA – The Internal Continuous Assessment shall be based on practical record and knowledge or skills acquired. The performance shall be assessed experiment wise by using continuous assessment format, A & B.

ESE- The End Semester Exam for Practical shall be based on performance in one of the experiments and may be followed by sample questions.

ITU607 SELF STUDY II

Teaching Scheme: 00 L+00T   **Total-00**   **Credits: 02**
Evaluation Scheme: 25 TA   **Total Marks: 25**

Note2: Self study II is based on one class test each on the basis of 20% curriculum of the courses ITU601,ITU602,CSU602,CSU603 declared by respective course coordinator at the beginning of semester. One faculty member shall be appointed as course coordinator for self study II and his/her teaching work load shall be considered as one hour per week.

ITU608 INDUSTRIAL LECTURE I

Teaching Scheme: **01L + 00 T**   **Total 01**
Credits: 00 (* Credits shall be awarded on the basis of combined assessment of ITU608 and ITU711.)
Evaluation Scheme: 00ICA + 00 ESE   **Total Marks: 00**
Duration of ESE: 00hrs.

Minimum twelve Industrial lectures shall be arranged, preferably once a week, which shall be delivered by the experts/Officials from Industries/Govt. organizations/ Private Sectors/Public Sectors such as NIC,BSNL etc. and covering the various aspects of Project planning, Design, Testing, Recent advances in the field of Information Technology etc. Topics of Industrial Lectures shall be general in nature and should not be the specific contents from the curriculum.