Syllabus and Course Scheme

Academic year 2014-15

B.Sc. – Computer Science

UNIVERSITY OF KOTA

MBS Marg, Swami Vivekanand Nagar,
Kota - 324 005, Rajasthan, India

Website: uok.ac.in

UNIVERSITY OF KOTA, KOTA

B.SC.COMPUTER SCIENCE Exam -2015

1. Scheme of Instruction:

Each year shall be of ten months (150 working days) duration. Details of lecture hours per week shall be as follows: **Theory:** Three hours/week for each Paper

Practical: Students are required to work in the Laboratory for 4 hours per week for each practical under faculty guidance.

2. Examination Scheme:

1. University shall conduct examinations only after completion of 150 working days of instruction in a year.
2. Each theory paper shall be of 100 marks (75 marks for written examination of 3 hrs duration and 25 marks for internal assessment).
3. Each practical paper shall be of 100 marks.
4. The internal marks will be awarded by committee consisting of Head of the Department & the faculty concerned.
5. The student have to pass internal and external exam separately theory as well as practical papers.

Theory:

1. **Assignments:** 40% of the internal assessment marks for each theory paper will be awarded on the basis of performance in the assignments regularly given to the students, and its records.
2. **Internal Examination:** 40% of the total Internal Assessment marks for each theory paper will be awarded on the basis of performance in written examination conducted by the faculty, one at the end of fourth month and another at the end of eighth month.
3. **Seminar/Oral examination:** 10% of the total internal assessment marks for each paper will be awarded on the basis of performance either in a seminar or internal viva-voce.
4. **Overall performance:** 10% of the total internal assessment marks will be awarded for each paper on the basis of performance and conduct in the classroom.

Practical :

1. **Project**: 80% of the total Internal Assessment Marks for each practical paper during I & II year will be awarded on the basis of project, its presentation and project report submitted by the students. This activity can be held in the team of maximum two students. There should be a project co-ordinator (faculty member of computer science department).
2. **Internal examination:** 10 % of the total Internal Assessment marks for each practical paper during I & II year will be awarded on the basis of performance in practical examination conducted by the faculty, once during the session. In III year it will be 80%.
3. **Overall performance:** 10 % of the total internal assessment marks will be awarded during I & II year for each practical paper on the basis of performance and conduct of the student in the practical lab. In III year it will be 20%.

Note: Detailed breakup of Internal Marks awarded as per above guidelines must be submitted to the university in a tabular format for each paper. Department/College must preserve answer books of internal examination for a period one year from the date of examination and must be presented to the university as and when required.

(a) **I division with distinction:** 75% or more marks in the aggregate provided the candidate has passed all the papers and examinations in the first attempt.
(b) **I division :** 60% or more marks but fails to satisfy the criteria for being classified as first division with distinction laid in (a).
(c) **II division :** All other than those included in (a) and (b) above i.e. $< 60\%$ and $\geq 45\%$.
(d) Passing criteria is as per university ordinance. A candidate must pass the examinations within five years of the initial admission to the first year of the course.

B.Sc (Computer Science)

Pt-I Examination- 2015

Courses of Study and Examination :

Paper	Paper Name	Lecture	Duration of exam. (hours)	Max. Marks		Total
				University Exam.	Internal Assessment	
Paper-I (BCS-101)	Introduction to Information Technology	3	3	75	25	100
Paper-II (BCS-102)	Basic Mathematics	3	3	75	25	100
Paper-III (BCS-103)	Problem Solving through C Programming	3	3	75	25	100
Paper-IV (BCS-104)	Database Management System	3	3	75	25	100
Paper-V (BCS-105)	Digital Electronics	3	3	75	25	100
	Practical					
Practical-I (BCS-106)	DBMS Lab	4(2+2)	3	75	25	100
Practical-II (BCS-107)	Programming Lab in C	4(2+2)	3	75	25	100
	TOTAL			**525**	**175**	**700**

***for each practical paper students have to submit the project.**

Pt-II Examination- 2015

1. **Courses of Study and Examination**

Paper	Paper Name	Lecture	Duration of exam. (hours)	Max. Marks		Total
				University Exam.	Internal Assessment	
Paper-I (BCS-201)	Computer Oriented Statistical Method	3	3	75	25	100
Paper-II (BCS-202)	Computer Organization	3	3	75	25	100
Paper-III (BCS-203)	Fundamentals of Operating Systems	3	3	75	25	100
Paper-IV (BCS-204)	Web Technology	3	3	75	25	100
Paper-V (BCS-205)	Data Structure	3	3	75	25	100
Practical-I (BCS-206)	Data Structure Lab	4(2+2)	3	75	25	100
Practical-II (BCS-207)	Web Technology Lab	4(2+2)	3	75	25	100
	TOTAL			525	175	700

***for each practical paper students have to submit the project**

Pt-III Examination- 2015

1. Courses of Study and Examination

Paper	Paper Name	Lecture	Duration of exam. (hours)	Max. Marks		Total
				University Exam.	Internal Assessment	
Paper-I (BCS-301)	Systems Software	3	3	75	25	100
Paper-II (BCS-302)	Visual Programming	3	3	75	25	100
Paper-III (BCS-303)	Unix Programming	3	3	75	25	100
Paper-IV (BCS-304)	Data Communication and Networking	3	3	75	25	100
Paper-V (BCS-305)	Software Engineering	3	3	75	25	100
Practical-I (BCS-306)	Visual Programming Lab	4(2+2)	3	75	25	100
Practical-II (BCS-307)	Unix Lab	4(2+2)	3	75	25	100
	TOTAL			525	175	700

***for each practical paper students have to submit the project**

B.Sc. Computer Science Pt-III Examination- 2015

BCS 301: Systems Software

Time: 3 Hrs. **Max. Marks: 75**

Unit – I

Language processors - Language processing activities and fundamentals - Language specification - Development Tools - Data Structures for Language processing- Scanners and Parsers.

Unit – II

Assemblers: Elements of Assembly language programming - Overview of the Assembly process - Design of a Tow-pass Assembler - A single pass Assembler for the IBM PC.

Unit – III

Macros and Macro processors - Macro definition, call, and expansion - Nested macro calls - Advanced macro facilities - Design of a macro preprocessor - Compilers: Aspects of compilation.

Unit – IV

Compilers and Interpreters - Memory allocation Compilation of Expressions and Control structures - Code optimization - Interpreters.

Unit – V

Linkers : Linking and Relocation concepts - Design of a linker - Self relocating Programs - A linker for MS DOS - Linking for over-lays - loaders Software tools: Software tools for program development - Editors - Debug monitors - Programming environments - User interfaces.

Text / Reference Books

1. L.L. Beck, "System Software, An Introduction to System Programming", Addison-Wesley, 1985.
2. D.M. Dhamdhere, Systems Programming and Operating Systems, Second Revised Edition, Tata McGrawhill Publ. Company 1999.

BCS 302: Visual Programming

Time: 3 Hrs. **Max.Marks: 75**

UNIT – I

Client Server Basics: Discover Client-Server and Other Computing Architectures, Understand File Server Versus Client-Server Database Deployment, Learn About the Two Tier Versus Three Tire Client-Server Model, Visual Basic Building Blocks and Default Controls: Forms, Using Controls, Exploring Properties, Methods and Events, Introduction To Intrinsic Controls, Working With Text, Working With Choices, Special Purpose Controls, VB Advance Controls: Events, Menu bar, Popup Menus, Tool bar, Message Box, Input Box, Built-in Dialog Boxes, Creating MDI, Working with Menus

UNIT – II

VB Programming Fundamentals And Variables: Introduction to Variables, Variable Declaration, Arrays, Introduction to Constants and Option Explicit Statement, Assignment Statements, Working With Math Operations, Strings, Formatting Functions, Controlling and Managing Program: All Control Statements, Loops, Error Trapping, Working With Procedures, Functions, Controlling How Your Program Starts, Common controls and control arrays: Introduction to common controls- Tree view, list view, tab strip, Creating and working with control arrays.

UNIT –III

Visual Basic and databases: Understanding the Data Controls and Bound Controls, Introduction to Data Form Wizard, Introduce DAO, Working With Record sets, Record Pointer, Filters, Indexes, Sorts And Manipulation of Records. Remote and ActiveX Data Objects: Working With ODBC, Remote Data Objects and Remote data Control, Introducing ADO, ADO Data Control

UNIT – IV

Using Data Grid Control and ActiveX Data Objects. ActiveX Controls, Extending ActiveX Controls and Classes: Creating, Testing, Compiling, Enhancing and User Drawn ActiveX Controls, Using ActiveX Control Interface Wizard and Property Pages Wizard, Introducing Ambient, Extender Objects, Creating Property Pages, Building Class Modules, ActiveX DLL.

UNIT – V

Client-Server Development Tools: COM, Services Models, Development Tools Included with VB 6, Working With SourceSafe Projects. Reports and Packaging: Data Reports and Crystal Reports, Packaging A Standard EXE Project, VB And Internet: Introduction to VBScript, Tools used with VBScript and VBScript Languages, Introduction to Active Server Pages, ASP Objects.

Text / Reference Books

1. Gary Cornell - Visual Basic 6 from the Ground up - Tata McGraw Hill - 1999.
2. Noel Jerke - Visual Basic 6 (The Complete Reference) - Tata McGraw Hill - 1999.

BCS 303: Unix Programming

Time: 3 Hrs. **Max.Marks: 75**

Unit – I

INTRODUCTION:

File and common commands - Shell - More about files - Directories- Unix system - Basics of file Directories and filenames - Permissions - modes - Directory hierarchy - Devices - the grep family - Other filters - the stream editor sed - the awk pattern scanning and processing language - files and good filters.

Unit – II

CONCEPTS OF SHELL:

Command line structure - Metacharacters - Creating new commands - Command arguments and parameters - program output as arguments - Shell variables - More on I/O redirection - loop in shell programs - Bundle - Setting shell attributes, Shift command line parameters - Exiting a command or the shell, evaluating arguments - Executing command without invoking a new process - Trapping exit codes -- Conditional expressions.

Unit – III

SHELL PROGRAMMING:

Customizing the cal command, Functions of command, While and Until loops - Traps - Catching interrupts - Replacing a file - Overwrite - Zap - Pick command - News command - Get and Put tracking file changes.

Unit – IV

FEATURES IN UNIX:

Standard input and output - Program arguments - file access - A screen at a time printer - On bugs and debugging - Examples - Zap - pick - Interactive file comparison program - Accessing the environment - Unix system calls - Low level I/O, File system Directories and modes, Processors, Signal and Interrupts.

Unit – V

PROGRAM DEVELOPMENT AND DOCUMENT PREPARATION:

Program development - Four function calculator - Variables and error recovery - Arbitrary variable names, Built in functions, Compilation into a machine, Control flow and relational operators, Functions and procedures - Performance evaluation - Ms macro package - Troff level - Tbl and eqn preprocessors - Manual page - Other document preparation.

Text / Reference Books

1. Brian W. Kernighan, Rob Pike - The UNIX Programming Environment - Prentice Hall of India(1984).
2. Steven Earhart - The UNIX System for MSDOS Users - Galgotia book source P. Ltd. (1990).
3. Stefen Prata - Advanced UNIX - A Programmer Guide.

BCS 304 : Data Communication and Networking

Time: 3 Hrs. **Max. Marks: 75**

Unit - I

Components of a data communication system, model of a data communication, data transmission concepts, digital and analog transmission, serial/parallel data transmission, signal encoding techniques, modulation and modems.

Unit - II

Guided and unguided transmission media, Transmission impairments, channel capacity, baud rate, bandwidth, multiplexing techniques, synchronous and asynchronous transmission, simplex, half duples and full duplex transmission.

Unit - III

Circuit switching, Packet switching and Message switching , Connection oriented and Connection less services, Computer Networks Protocols and Standards, Local area networks, Types of LAN (star, Ethernet, bus, FDDI), LAN Technology(IEEE 802.3, 802.4, 802.5), wide area networks.

Unit – IV

ISO-OSI model of networking, different layers and their functions, Networking and Internetworking, Services gateways, bridges, repeaters, routers, Introduction to ISDN, DSL and cable TV modem.

Unit - V

Introduction to Internet applications like DNS,FTP,SMTP,SNMP,WWW,HTTP,URL,E-mail, Teleconferencing & Electronic Banking, Network Security and privacy, Awareness of Indian Networks-NIC NET,ERNET etc, introduction to mobile computing, impact of social engineering sites.

Text / Reference Books

1. Behrouz and Forouzan - Introduction to Data Communication and Networking - 2nd Edition - TMH – 2001.
2. Stallings W. Data and Computer Communications, Pearson Educations.
3. Jean Wairand - Communication Networks (A first Course) - Second Edition - WCB/ McGraw Hill - 1998.
4. S. Tannanbauim, Computer Networks, Pearson Educations.

BCS 305 Software Engineering

Time: 3 Hrs. **Max.Marks: 75**

UNIT – I

Introduction to Software Engineering: Definition, size, factors - Quality and Productivity Factors - Managerial Issues - Planning a software project: Defining the problem - Developing a Solution Strategy - Planning the Development Process - Planning an Organization structure - Other Planning Activities.

UNIT – II

Software Cost Estimation: Software cost factors - Software Cost Estimation Techniques - Staffing-level Estimation - Estimating Software Maintenance Costs - The Software Requirements Specification - Formal Specification Techniques - Languages and Processors for Requirements Specification.

UNIT – III

Software design: Fundamental Design Concepts - Modules and Modularization Criteria - Design Notations - Design Techniques - Detailed Design Considerations - Real-Time and Distributed System Design - Test Plans - Milestones, walkthroughs, and Inspections.

UNIT - IV

Implementation issues: Structured Coding Techniques - Coding Style - Standards and Guidelines - documentation guidelines -Type Checking - Scoping Rules - Concurrency Mechanisms.

UNIT - V

Quality Assurance - Walkthroughs and Inspections - Static Analysis - Symbolic Execution - Unit Testing and Debugging - System Testing - Formal Verification: Enhancing Maintainability during Development - Managerial Aspects of Software Maintenance - Source Code Metrics - Other Maintenance Tools and Techniques.

Text / Reference Books

1. R.Fairley, Software Engineering Concepts, Tata McGraw-Hill Edn. 1997.
2. R.S. Pressman, Software Engineering, Fourth Ed., McGraw Hill, 1997.

Innovations and Employability in the area of Computer Science

Innovations

Computer Science is the most creative and diverse field of all the technology fields. If you can imagine an outcome, this major will provide you the tools to create it. In addition to providing a solid grounding in all the most significant areas of computer science, The syllabus is designed for students considering their individual needs, who want to study a broad computer science curriculum with an emphasis on combining both the theory and practice of computer science. Then the syllabus will be able to develop computer professionals with a good grasp of how to design and build high quality systems for industry that are usable in real world socio-technical contexts.

The overall aim to develop this syllabus of Computer Science course is to deliver a broad but rigorous Computer Science education coupled with direct exposure to cutting edge research. Graduates and Post Graduate of this programme are intended to continue directly into careers involving innovative thinking and problem solving, as part of an advanced research, development or other applied field of computer science.

Employability

Selection to study the Computer Science opens up many avenues for future career prospects.
Almost every major challenge in the world turns to the use of computer science to solve problems; from medical research, education, supporting aid work in disaster areas, helping to create a sustainable environment, the logistics of moving products around the world, to the world of business and securing and managing the vast levels of data through visualisation, security and transmission; not to mention the world of media.

Being a successful Computer professional is not just about solving technical problems, but also collaboration, leadership, and teamwork; which is why our degree courses encourage you to gain these interdisciplinary and interpersonal skills in addition too.

- Computers and computing technology lies at the heart of organisations across all industrial sectors; and our graduates are equipped to support and develop these systems.
- Computer Technology is the fastest developing technology in the world, and the requirement for graduates with the skills to work in this field is continuing to grow, whilst the actual supply of graduates with the skills is dropping worldwide.

Computer Science will fulfill the growing market demand in government and private sectors both for expertise in following:

Databases

Communication Networking

Image processing

Animation

Software development ..... etc

JOB OPPORTUNITIES FOR UNDERGRADUATE STUDENTS

A. [BCA/B.Sc. (CS/IT)/BA/BSc./B.Com (with Computer)/PGDCA] graduate can work as a

1. Computer Operator/Computer
2. Informatic Assistant etc. In a government sector
3. BDP, Desktop Publishing, BPO professionals
4. Low-level Web designers, Graphic designers
5. Data entry operators
6. Technical Assistant