PROGRAMME GUIDE

FOR

BACHELOR OF COMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI - 110 068

www.ignou.ac.in

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MESSAGE FROM PROGRAMME COORDINATOR

Dear Student,

I welcome you to the BCA Programme through integrated mode. This BCA Programme is structured as per latest development in the Computer Science Applications and need of the Information Technology Industry requirements. In integrated mode, you will receive support from IGNOU through Internet as well as through the network of our Regional and Study Centres. You will be attached to a Study Centre which will offer counselling sessions (Both Theory and Practical). You will receive printed course material in accordance with our dispatch schedule. You are advised to attend theory and practical counselling sessions regulary.You need to have a minimum of 70% attendance for practical counselling sessions to appear for Term End Practical Examinations. You need to submit requisite assignments before the due dates to become eligible to appear for Term End Theory Examinations.

Also, you are requested to take note of the following:

The material and assignments are distributed (by post/by hand) to the student at regional centres/study centres and programme study centres. You are advised to contact your RC/SC for the same.

"The University also sends study materials and assignments, wherever prescribed, to the students by registered post and if a student does not receive the same for any reason whatsoever, the University shall not be held responsible for that."

"In case a student wants to have assignments, s/he can obtain a copy of the same from the Study Centre or Regional Centre or may download it from the IGNOU website-http://www.ignou.ac.in."

"The students are specifically instructed to send Examination Forms to Registrar (SED) only and to no other place and they are also advised to submit the Registration/Re-registration Forms only at the respective Regional Centres and nowhere else. If any student sends the Registration/Re-registration Forms, Examination Forms to wrong places and thereby misses the scheduled date and consequently a semester/year, s/he will have no claim on the University for regularisation."

Programme Guide is a very important document for you, as a distance learner you may have several queries, many of them would be answered by this booklet. Preserve this booklet until you successfully complete the BCA Programme.

Some useful addresses are given on **page number 59** in this Programme Guide. In case of any difficulty, communicate to the concerned, on the listed address for fast action. You are advised to visit **IGNOU website-http://www.ignou.ac.in, and your study center regularly for latest information if any.** I wish you success in pursuing BCA Programme.

Wishing you all the best,

Mangala Prasad Mishra
Email ID : bca@ignou.ac.in

1. BASIC INFORMATION

1.1 BCA Programme Objectives

The basic objective of the programme 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. After acquiring the Bachelor's Degree (BCA) at IGNOU, there is further educational opportunity to go for an MCA at IGNOU or Master's Programme at any other University/Institute. Also after completing BCA Programme, a student should be able to get entry level job in the field of Information Technology or ITES.

1.2 Duration of the Programme (Minimum - 3 Years, Maximum - 6 Years)

To fulfill the requirements for acquiring the BCA, a student may clear all the courses in a minimum of three years and a maximum of 6 years. In case the student is unable to pass all the courses of the BCA programme in 6 years, s/he can continue for another two years by seeking Re-admission to the courses which s/he is unable to successfully complete. For the re-admission rules and paying the requisite fee, you may contact the Regional Centre/Student Registration Division for further information. But, you are advised to pass all the courses successfully in 3 years. If a student fails to complete all the requirements for the award of degree within the prescribed maximum duration, he/she can seek re-admission by remitting the pro-rata fee of the left-over courses. According the duration would be extended by another two years as per re-admission rules.

1.3 Programme Fee

Rs.4500 per semester. The fees may change as and when university decide. The student may get latest update on the fees from the concerned IGNOU Regional Centre or from the Student Registration Centre (SED).

1.4 Medium of Instruction

The medium of instruction is only in **English.** The course material is also in English.

1.5 Credit System

The University follows the 'Credit System' for its programmes. ***Each credit is worth 30 hours of student study time, comprising all the learning activities.*** Thus, a three-credit course involves 90 study hours. This helps the student to understand the academic effort one has to put into successfully complete a course. **Completion of the programme requires successful completion of both assignments and the Term End Examination of each course in the programme.**

1.6 BCA Programme Structure

The programme has been divided into two semesters per year (January to June and July to December). Consequently, there will be two examinations every year - one in the month of June

for the January to June semester courses and the other in December for the July to December semester courses. The students are at liberty to appear for any of the examinations schedule conducted by the University during the year subject to completing the minimum time framework other formalities prescribed for the programme.

BCA Programme Structure

Semester	Course Code	Course Title	Credits
I	FEG-02	Foundation course in English -2	4
	ECO-01	Business Organization	4
	BCS-011	Computer Basics and PC Software	3
	BCS-012	Mathematics	4
	BCSL-013	Computer Basics and PC Software Lab	2
II	ECO-02	Accountancy-1	4
	MCS-011	Problem Solving and Programming	3
	MCS-012	Computer Organization and Assembly Language Programming	4
	MCS-015	Communication Skills	2
	MCS-013	Discrete Mathematics	2
	BCSL-021	C Language Programming Lab	1
	BCSL-022	Assembly Language Programming Lab	1
III	MCS-021	Data and File Structures	4
	MCS-023	Introduction to Database Management Systems	3
	MCS-014	Systems Analysis and Design	3
	BCS-031	Programming in C++	3
	BCSL-032	C++ Programming Lab	1
	BCSL-033	Data and File Structures Lab	1
	BCSL-034	DBMS Lab	1
IV	BCS-040	Statistical Techniques	4
	MCS-024	Object Oriented Technologies and Java Programming	3
	BCS-041	Fundamentals of Computer Networks	4
	BCS-042	Introduction to Algorithm Design	2
	MCSL-016	Internet Concepts and Web Design	2
	BCSL-043	Java Programming Lab	1
	BCSL-044	Statistical Techniques Lab	1
	BCSL-045	Algorithm Design Lab	1
V	BCS-051	Introduction to Software Engineering	3
	BCS-052	Network Programming and Administration	3
	BCS-053	Web Programming	2
	BCS-054	Computer Oriented Numerical Techniques	3
	BCS-055	Business Communication	2
	BCSL-056	Network Programming and Administration Lab	1

	BCSL-057	Web Programming Lab	1
	BCSL-058	Computer Oriented Numerical Techniques Lab	1
VI	BCS-062	E-Commerce	2
	MCS-022	Operating System Concepts and Networking Management	4
	BCSL-063	Operating System Concepts and Networking Management Lab	1
	BCSP-064	Project	8

Total: 39 Courses and 99 Credits.

1.7 Recognition

IGNOU is a Central University established by an Act of Parliament in 1985 (Act No.50 of 1985) IGNOU Degrees/Diplomas/Certificates are recognized by all member Universities of Association of Indian Universities (AIU) and are at par with Degrees/Diplomas/Certificates of all Indian Universities/Deemed Universities/Institutions vide UGC Circular No. F1-52/2000 (CPP-II) dated 5 May, 2004 & AIU Circular No. EV/B (449)/94/177115 dated January 14, 1994.

1.8 Associate Studentship Scheme

There is a provision of Associate Studentship scheme in BCA wherein the student can register for a **minimum of 8 credits and a maximum of 32 credits**. This scheme is permissible for any course(s) of any programme offered by IGNOU, subject to the conditions that the students fulfill the minimum eligibility requirements for the respective programme and also should undertake the minimum and maximum credits specified.

Students are not eligible for admission under Associate Studentship scheme to the course(s) of the programme(s) where clearance of an entrance test is mandatory and also to the programmes where the intake is to a limited number of seats.

1.9 Student Support Services

In order to provide individualized support to its learners, the University has created a number of Study Centres throughout the country for this Programme. These are administratively coordinated by the Regional Centres. The Study Centres are the contact points for the students on all major aspects of the Programme. These include counselling sessions, practicals, reference library facilities, disseminating information and advice, facilities for audio-visual training aids and teleconferencing.

The University may not always be able to communicate to all the students individually. All the important communications are sent to the Regional Directors who in turn will intimate them to the Study Centre Coordinators. The coordinators display such circulars / notifications on their notice boards for the benefit of the students. ***You are, therefore, advised to be in touch with your Study Centre Coordinator on a more regular basis so as to get the latest information about assignments, submission schedules (assignments and examination forms), declaration of results, etc.***

1.20 Newsletter

The IGNOU Newsletter is published twice in a year (April and October) in English and Hindi. This periodical communication is delivered by post to all the students of IGNOU along with course material. Information regarding the examination schedule, new courses to be launched, admissions, telecast schedule, teleconferencing schedule etc., is also provided through the IGNOU newsletter.

It covers various activities at IGNOU Headquarters, Regional Centres and Study Centres. It also carries important notifications from time to time.

1.21 How to contact the BCA Programme Coordinator?

Students may contact the BCA Programme Coordinator by sending a communication through post to The BCA Programme Coordinator, SOCIS, Vishveswaraiah Bhavan, C-Block, IGNOU Academic Complex, IGNOU, Maidangarhi, New Delhi – 110068, or can send an Email to bca@ignou.ac.in or by telephone with Tel Nos: 011-29572903/29533436.

2. INSTRUCTIONAL SYSTEM

The methodology of instruction in this university is different from that of the conventional universities. The Open University system is more learner-oriented, and the student has to be an active participant in the teaching-learning process. Most of the instruction is imparted through a distance with only a small component of face-to-face communication. The University follows a multi-channel approach for instruction. It comprises a suitable mix of:

- ☞ self-instructional printed material
- ☞ audio / video cassettes and CDs
- ☞ audio-video programmes transmitted through AIR and Doordarshan, and at study centre
- ☞ face-to-face counselling at Study Centres by academic counsellors
- ☞ reference library at study centre
- ☞ web based academic support: e-content available on e-Gyankosh portal
- ☞ assignments
- ☞ practicals
- ☞ Gyan Darshan Channel, including teleconferencing, Eklavya exclusively for Technology programmes
- ☞ Gyan Vani.

2.1 Print Material

Printed materials are the primary form of instructional materials. These are supplied to the learners in the form of several booklets called blocks. Each block consists of several units. The size of a unit is such that the material given therein may be expected to be studied by a student in a session of about 4 to 6 hours of study. Therefore, you have to concentrate mainly on the print materials, which we send to you. However, the fast pace of computer industry necessitates that students must do some additional readings. Students are advised to study reference books without fail. Studying the printed material alone may not be sufficient to write assignments and prepare for the term-end Examinations. Some reference books are available at your study centre.

2.2 Audio-Video Material and CDs

These are video-cassettes meant for clarification and enhancement of understanding. However, audio / video are supplementary material and would not be available in all the courses. The audio-video material supplements the print material. Hence, we advise you to make use of it as that will help you to understand the subject better. However, audio-video material will normally not be supplied to the students individually but will be made available at the Study Centres. You can

watch these programmes during counselling sessions. The schedule for screening these films has been synchronised with the progress of relevant written material. Students desirous of buying the audio-video tapes can procure them from:

The Director
EMPC, Sanchar Kendra
IGNOU, Maidan Garhi
New Delhi-110068
Ph./Fax:91-011-29534299

The programmes of SOCIS are also telecast on DD-1(National Channel). The telecast schedule of transmission of programmes is communicated through a monthly booklet called **Gyan Darshan**. You can contact your Study Centre Coordinator to go through it. You may write to the above-mentioned address for a copy of the same or see the schedule on the IGNOU's website.

2.3 Counselling Sessions

The details of the theory and practical counselling sessions are given in the following sections.

2.3.1 Theory Sessions

In distance education, face-to-face contact between the learners and their tutors/counsellors is relatively less. The purpose of such a contact is to answer some of your questions and clarify your doubts that may not be possible through any other means of communication. It also provides you with an opportunity to meet your fellow students.

There are academic counsellors at the Study Centres to provide counselling and guidance to you in the courses that you have chosen for study. Normally, these sessions will be held at the study centres on Saturdays and Sundays.

You should note that the counselling sessions would be very different from the classroom teaching or lectures. Counsellors will not be delivering lectures as in conventional teaching. They will try to help you to overcome difficulties that you face while studying for the MCA programme. In these sessions, you must try to resolve your subject-based difficulties and any other related problems.

Before attending the counselling session for each course, please go through your course material as per the session schedule and make a plan of the points to be discussed. Unless you have gone through the Units, there may not be much to discuss and may not be fruitful.

2.3.2 Practical Sessions and Compulsory Attendance

The practical sessions will be held in the computer centres / labs of the Study Centres. In these computer labs, the participants will have the facility to use the computer and software packages relevant to the syllabus. The following points regarding the practical attendance must be noted:

(i) 70% attendance is compulsory for each lab course. **However, this condition is not applicable for the computer time given for assignment implementation.**

(ii) This is a pre-requisite for taking the term-end practical examination in the respective lab courses.

(iii) A student who fails to **fulfill the 70% attendance requirements** will be allowed to re-register for that lab course. For fee details and the application form, please contact your Regional Centre.

(iv) Students are required to **prepare a separate lab record for each lab course**. The practical counsellor should duly sign this lab record after each session.

(v) Student attendance will be recorded coursewise at the study centre.

(vi) Strictly follow the guidelines given in the Lab manuals for the respective lab courses.

(vii) **Computer to Student ratio will be 1:2.**

2.3.3 Counselling Session Details:

Course wise Number of Counseling Sessions (Theory/Lab)

Semester	Course Code	Course Title	Credits	No. of Councelling Sessions
I	FEG-02	English (To be adopted from SOH)	4	**5**
	ECO-01	Business Organization (To be adopted from SOMS)	4	**5**
	BCS-011	Computer Basics and PC Software	3	**9**
	BCS-012	Mathematics	4	**12**
	BCSL-013	Computer Basics and PC Software Lab	2	**20**
II	ECO-2	Accountancy-1 (To be adopted from SOMS)	4	**5**
	MCS-011	Problem Solving and Programming	3	**5**
	MCS-012	Computer Organization and Assembly Language Programming	4	**8**
	MCS-015	Communication Skills	2	**2**
	MCS-013	Discrete Mathematics	2	**3**
	BCSL-021	C Language Programming Lab	1	**10**
	BCSL-022	Assembly Language Programming Lab	1	**10**
III	MCS-021	Data and File Structures	4	**8**
	MCS-023	Introduction to Database Management Systems	3	**5**
	MCS-014	Systems Analysis and Design	3	**5**
	BCS-031	Programming in C++	3	**9**
	BCSL-032	C++ Programming Lab	1	**10**
	BCSL-033	Data and File Structures Lab	1	**10**
	BCSL-034	DBMS Lab	1	**10**
IV	BCS-040	Statistical Techniques (To be adopted from SOS)	4	**5**
	MCS-024	Object Oriented Technologies and Java Programming	3	**5**
	BCS-041	Fundamentals of Computer Networks	4	**12**
	BCS-042	Introduction to Algorithm Design	2	**6**
	MCSL-016	Internet Concepts and Web Design	2	**20**
	BCSL-043	Java Programming Lab	1	**10**
	BCSL-044	Statistical Techniques Lab	1	**10**
	BCSL-045	Algorithm Design Lab	1	**10**
V	BCS-051	Introduction to Software Engineering	3	**9**
	BCS-052	Network Programming and Administration	3	**9**
	BCS-053	Web Programming	2	**10**
	BCS-054	Computer Oriented Numerical Techniques	3	**9**
	BCS-055	Business Communication	2	**6**

	BCSL-056	Network Programming and Administration Lab	1	**10**
	BCSL-057	Web Programming Lab	1	**10**
	BCSL-058	Computer Oriented Numerical Techniques Lab	1	**10**
VI	BCS-062	E-Commerce	2	**6**
	MCS-022	Operating System Concepts and Networking Management	4	**8**
	BCSL-063	Operating System Concepts and Networking Management Lab	1	**10**
	BCSP-064	Project	8	**10**

Note:

- For ECO-01,ECO-02, and FEG-02 courses number of counselling sessions will be as per existing decisions of respective schools.
- For BCS courses **3** Theory Counselling Session per Credit.
- For Lab courses **10** counseling sessions for 1 credit.
- For MCS Courses number of counseling sessions is allocated as per existing rules.
- BCS-053 course is allocated **10** counseling sessions as a special case.

Semester wise Counseling Sessions:

Semester	**No. of Sessions**		**No. of Hours**	
	Theory	**Practical**	**Theory**	**Practical**
I	31	20	62	60
II	23	20	46	60
III	27	30	54	90
IV	28	50	56	150
V	43	30	86	90
VI	14	20	28	60
TOTAL	**166**	**170**	**332**	**510**

Note: 70% attendance is compulsory in Practical Lab Sessions. However, this condition is not applicable for the time given for assignment implementation.

3. BROWSING IGNOU'S WEBSITE

The IGNOU's website is a dynamic source of latest information and will be undergoing continuous updates. IGNOU itself is continuously changing to bring about improvement in quality of its services. There are contents on the site which are open to all, but then there are also areas of restricted access. For example, course materials, FAQs, assignments and related contents are available only to those who have registered for and paid fees for the said course. Some sample courses are open to visitors to have a feel of them, before taking the decision to register with IGNOU.

3.1 Navigation from Home Page

The learners can have access to IGNOU's website at the following address (URL) ***http://www.ignou.ac.in***. As students get connected to this site, the following page displays the Home Page of IGNOU's web site (Figure 1). Students need to click on various options to get the related information.

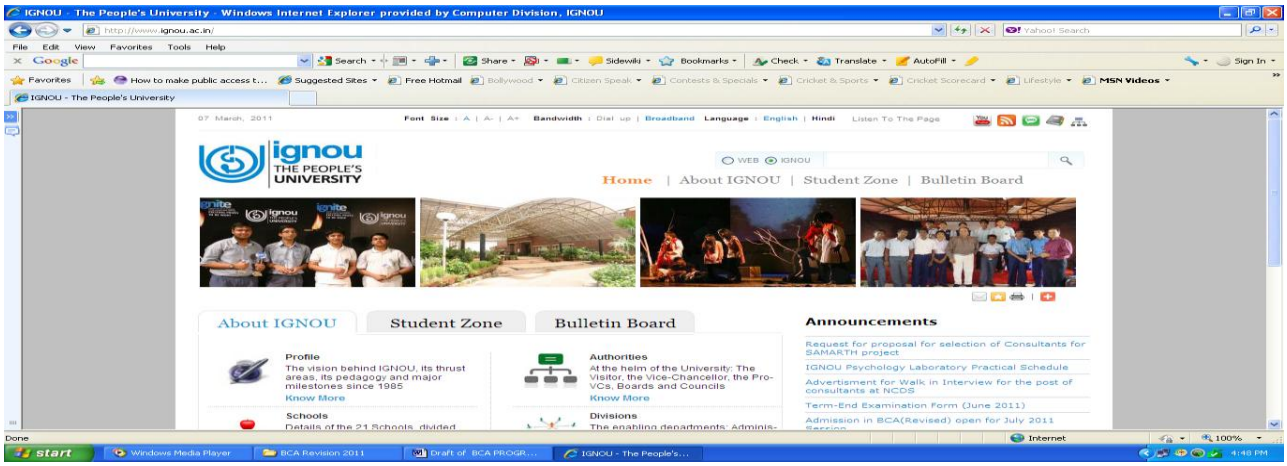

Figure 1: IGNOU Website

Upon clicking on the **Schools** option the page related to the links of various schools is displayed and from there you may go to SOCIS page as shown in the Figure 2. From this page students can access the required information as described, briefly, in subsequent pages.School of Computer and Information Sciences (**SOCIS)** offers the Computer Programmes: PhD., MCA, BCA and CIT as shown in Figure 3.

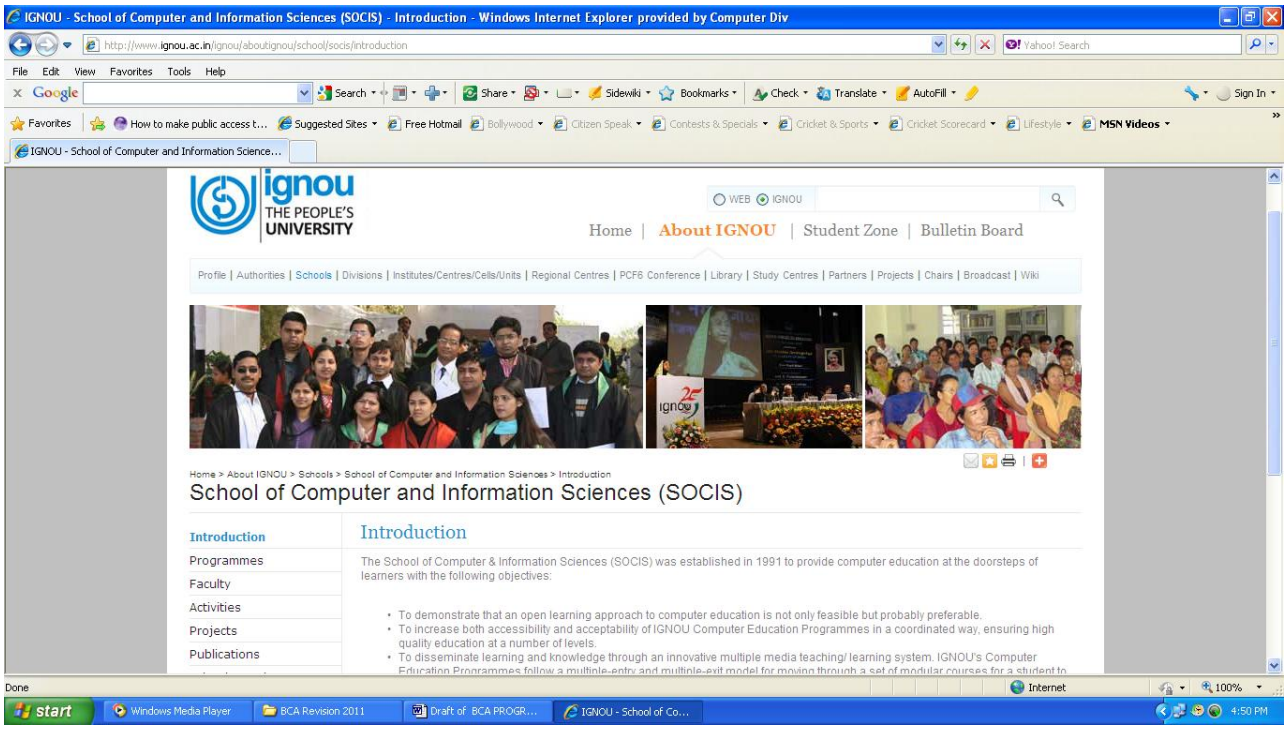

Figure 2: SOCIS Page on IGNOU Website

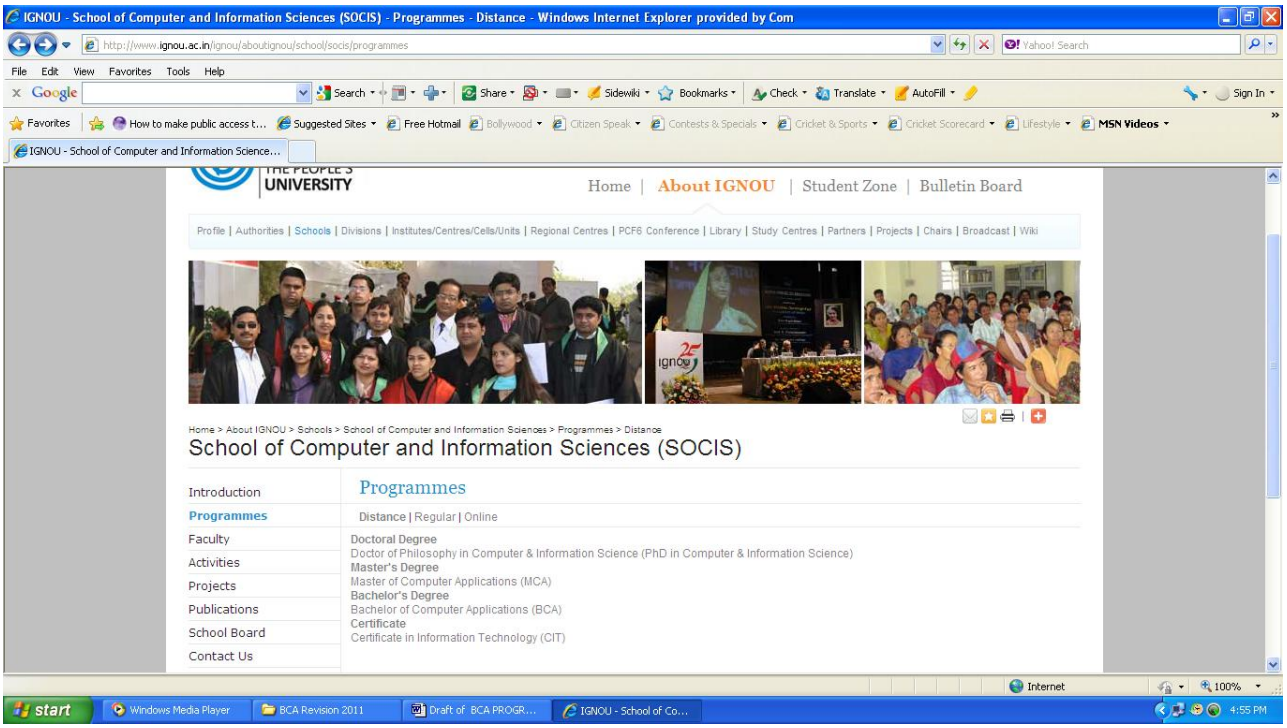

Figure 3: SOCIS Programmes

3.2 Navigation of BCA Page

School of Computer and Information Sciences provides Computer Education Programmes. As soon as School of Computer and Information Sciences link is selected, a page introducing the school is displayed as shown in the Figure 4. The page BCA page of School of Computer and Information Sciences looks like this:

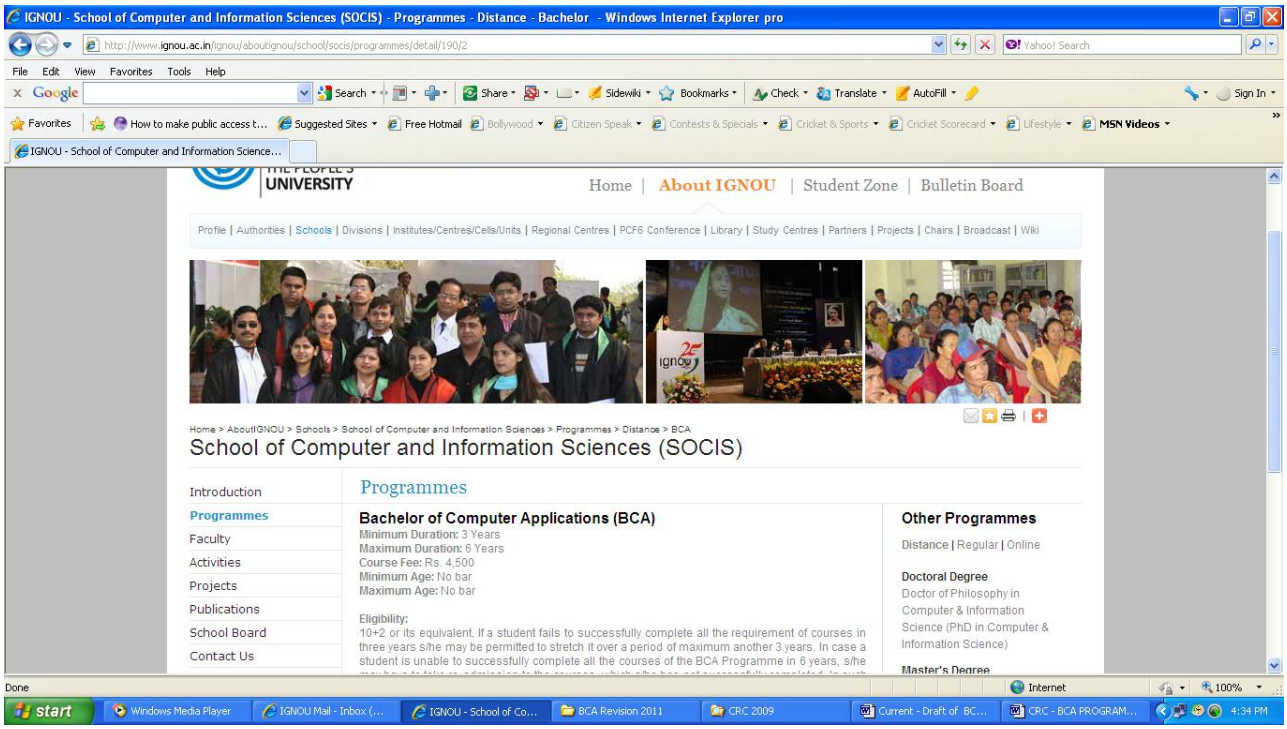

Figure 4: BCA Page

4. BCA(Revised Syllabus) PROGRAMME SYLLABUS

The following is the syllabus of all the six semesters of BCA programme.

4.1 Detailed Syllabus of BCA First Semester

1. FEG-02 : Foundation course in English -2 4 Credits

Block 1
Unit 1: Writing paragraph-1,
Unit 2: Writing paragraph-2, the development of a paragraph
Unit 3: Writing a composition
Unit 4: Expository composition
Unit 5: Note-taking 1
Unit 6: Writing reports-I, reporting events

Block 2
Unit 7: Argumentative composition-1, techniques of argument
Unit 8: Argumentative composition-1, logical presentation
Unit 9: Note taking-2, use of tables and diagrams
Unit 10: Writing reports-2, reporting meetings and speeches
Unit 11: Writing summaries-1
Unit 12: Writing summaries-2

Block 3
Unit 13: Writing paragraphs-2
Unit 14: Narrative composition-1
Unit 15: Narrative composition-2
Unit 16: Writing reports-3, reporting interviews
Unit 17: Writing reports-4, reporting surveys
Unit 18: Writing summaries-3

Block 4
Unit 19: Descriptive composition-1, describing persons
Unit 20: Descriptive composition-2, describing places and objects
Unit 21: Descriptive composition-3, describing conditions and processes
Unit 22: Note-taking-3,
Unit 23: Writing reports-5, reporting experiments
Unit 24: Summing up

2. ECO-01: Business Organisation 4 Credits

This course consists of five blocks containing 18 units in all. After studying this course, you should be able to:

- Explain the nature of business organisation and identify various forms of organisation learn how business units are set up and financed
- Under the ways and means of marketing the goods
- Explain how aids-to-trade facilitate the business operations
- Evaluation the role of government in business

Block 1: Basic Concepts and Forms of Business Organisation
Unit 1: Nature and scope of Business
Unit 2: Forms of Business Organisation – I
Unit 3: Forms of Business Organisation – II

Unit 4: Business Promotion

Block 2: Financing of Business
Unit 5: Methods of Raising Finance
Unit 6: Long-term Financing and Underwriting,
Unit 7: Stock Exchanges

Block 3: Marketing
Unit 8: Advertising
Unit 9: Advertising Media
Unit 10: Home Trade and Channels of Distribution
Unit 11: Wholesalers and Retailers
Unit 12: Procedure for Import and Export Trade

Block 4: Business Services
Unit 13 : Banking
Unit 14 : Business Risk and Insurance
Unit 15 : Transport and Warehousing

Block 5: Government and Business
Unit 16 : Government and Business
Unit 17 : Forms of Organisation in Public Enterprises
Unit 18 : Public Utilities

3. BCS-011: Computer Basics and PC Software 3 Credits

Objectives: This is the first course in Computer Science for the BCA students; therefore, it deals with the basic concepts of computers. It discusses about the computer hardware, its components and basic computer architecture. The course also deals with the basic computer software including the operating system and its concepts. This course also highlights some of the open source software technologies. Finally the course highlights the applications of computers that include web applications, social networking and wiki.

Block 1: Basics of Computer Hardware

Unit 1: Computer their Origin and Applications
A bit of history highlighting the concepts, Abacas, Difference Engine, Electro-magnetic Computers, Discrete components, IC circuits, Current hardware Platforms, Description of current applications of computer highlighting role of computers, Limitations of Computers
Unit 2: Functioning of a Computer
Components of a computer and their role, Number system, Codes ASCII Unicode
Concept of Instruction – a simple example, Role of ALU and CU with the help of an example
Unit 3: Memory System
Type of memories and their characteristics, What is the need of memory hierarchy?
Memory Hierarchy with examples of each level , Current trends in memory
Unit 4: I/O devices and their functions
I/O devices, Current trends in I/O
Unit 5: My Personal Computer
Explain the configuration of PC and its components in respect of identification of various components so that a student can relate all the terms discussed in Unit 1 to 4 to this configuration.

Block 2: Basics of Computer Software

Unit 1: Software Evolution
Different type of software and its evolution, System and application software, Utility software, Perverse software, Open Source software

Unit 2: Operating System Concepts
Need and Functions, Type of OS starting from Batch, Multi-programming and real time Network and distributed OS, Web OS, Examples of OS and their features
Unit 3: Concept of Programming Languages
Some basic constructs, Editors, Compilers and interpreters, Assemblers
Unit 4: Computer Applications
Concepts of Open Source Software, Philosophy – licensing, copyright
Project Management Software, Timesheet system, Office Applications, Word Processing – Creating a Memo for a number of people, Spreadsheet – Creating a sheet of Income & deduction and calculation of IT Database – a small application with data records, a form, a query and a report
Email – Sending mail to a number of people in a group.

Block 3: Internet Technologies

Unit 1: Networking and Internet
Basic of Networking Concepts, Advantages of Networking, Basic model of Networks, Network Devices, TCP/IP, Web addresses, DNS, IP addresses,
Unit 2: Web Applications I
Browsing, E-mail, Messenger/Chat
Unit 3: Web Applications II
Blogging, E-Learning and wiki, Collaboration, Social Networking

4. BCS-012: Basic Mathematics 4 Credit

Objective: The primary objective of this course is to introduce students some of the mathematics through which they can develop some mathematical maturity, that is enhance their ability to understand and create mathematical arguments. The secondary objective of this course is to prepare students for mathematical oriented courses in computer science such as discrete mathematics, database theory, analysis of algorithms etc.

Block-1: Algebra 1

Unit-1: Determinants
Determinants of order 2 and 3, properties of determinants; evaluation of determinants. Area of triangles using determinants, cramer's rule.
Unit-2: Matrices -1
Definition, equality, addition and multiplication of matrices. Adjoint and inverse of a matrix. Solution of a system of linear equations – homogeneous and non-homogeneous.
Unit-3: Matrices -2
Elementary row operations; rank of a matrix, reduction to normal form,Inverse of a matrix using elementary row operations.
Unit-4: Mathematical Induction
Principle of mathematical induction -1 and 2

Block 2: Algebra 2

Unit 1: Sequence and Series
Definition of sequence and series; A.P, G.P, H.P and A.G.P. $\sum n$, $\sum n^2$ and $\sum n^3$,Idea of limit of a sequence.
Unit 2: Complex Number
Complex number in the form of a+ib. Addition, multiplication, division of complex numbers. Conjugate and modulus of complex numbers. De Moivre's Theorem.
Unit 3: Equations

Quadratic, cubic and biquadratic equations. Relationship between roots and co-efficient. Symmetric functions of roots.

Unit 4: Inequalities

Solution of linear and quadratic inequalities.

Block 3 Calculus (Without Trigonometry)

Unit 1: Differential Calculus

Concept of limit and continuity; differentiation of the sum, difference, product and quotient of two functions, chain rule. Differentiation of parametric functions. 2^{nd} order derivatives.

Unit 2: Simple Application of Differential Calculus

Rate of change; monotoncity-increasing and decreasing; maxima and minima.

Unit 3: Integration

Integration as an anti-derivative. Integration by substitution and by parts.

Unit 4: Application of Integration

Finding area under a curve. Rectification.

Block 4 Vectors and Three-Dimensional Geometry

Unit 1: Vectors-1

Vectors and scalars, magnitude and direction of a vector. Direction cosines/ratio of vectors. Addition of two vectors. Multiplication of a vector by a scalar. Position vector of a point and section formula.

Unit 2: Vector-2

Scalar (Dot) product of vectors, Vector (Cross) product of vectors. Scalar triple product and vector triple product.

Unit 3: Three- Dimensional Geometry-1

Introduction, Distance formula. Direction cosines/ratio of a line passing through two points. Equations of a line in different forms; angle between two lines; Coplanar and skew lines. Distance between skew lines.

Unit 4: Linear Programming

Introduction, definition and related terminology such as constrains, objective function, optimization. Mathematical Formulation of LPP. Graphical method of solving LPP in two variables. Feasible and inferring solution (up to three non-trivial constraints)

5. BCSL-013: Computer Basics and PC Software Lab 2 Credits

Objectives: The main objectives of PC Software Lab course are to familiarize with basic operations of:

i) Operating systems such as Windows and Linux.
ii) Word Processor such as Open Office and MSWord.
iii) Workbook, worksheet, graphics and Spreadsheets.
iv) PowerPoint including animation and sounds.
v) Address book, Spam and Filtering in E-mail.
vi) Browsing, Search, Discussion forum and Wiki's.

Section 1: Operating System

Session 1: Familiarization (Keyboard, Memory, I/O Port), Session 2: Windows (2 Session)
Session 4: Linux (2 Session)

Section 2: Word Processor (Open Office and MS Word)

Session 1: Basic Operations (Font selection, Justification, Spell check, Table, Indentation),Session 2: Table of Contents, Track Changes and Commenting.,Session 3: Mail Merge, Printing, Practice session.

Section 3: Spread sheet (Concept of Worksheet, Workbook and cell)

Session 1: Data entry, Data editing and Formula,Session 2: Functioning,Session3: Graphics and Practice session

Section 4: PowerPoint

Session 1: Basics operation,Session 2: Animation and Sounds

Section 5: E-mail
Session 1: Basic Operation,Session 2: Address Book, Spam and Filtering
Section 6: Browsing and Discussion Forum
Session1: Browsing and Search (2 Sessions),Session 3: Discussion Forum, Wiki and Google Doc (3 Sessions)

4.2 Detailed Syllabus of BCA Second Semester

1. ECO-02: Accountancy- I 4 Credits

This course consists of five blocks containing 22 units in all. This course introduces you to the basic accounting concepts and framework. It also covers the preparation of accounts of non-trading and those from incomplete records. After studying this course, you should be able to:

- Understand the whole process of accounting
- Work out the net result of business operations by preparing final accounts for both trading and non-trading concerns
- Appropriate special features of accounting fro consignments and joint ventures
- Describe different methods of providing depreciation
- Explain the need for making provisions and various kinds of reserves

Block 1: Accounting Fundamentals

Unit 1 : Basic Concepts of Accounting
Unit 2 : The Accounting Process
Unit 3 : Cash Book and Bank Reconciliation
Unit 4 : Other Subsidiary Books
Unit 5 : Bills of Exchange

Block 2: Final Accounts
Unit 6 : Concepts Relating to Final Accounts
Unit 7 : Final Accounts – I
Unit 8 : Final Accounts – II
Unit 9 : Errors and their Rectification

Block 3: Consignment and Joint Ventures
Unit 10 : Consignments Accounts – I
Unit 11 : Consignments Accounts – II
Unit 12 : Consignments Accounts – III
Unit 13 : Joint Venture Accounts

Block 4: Accounts from Incomplete Records
Unit 14 : Self Balancing System
Unit 15 : Accounting from Incomplete Records – I
Unit 16 : Accounting from Incomplete Records – II
Unit 17 : Accounting from Incomplete Records – III

Block 5: Accounts of Non-trading Concerns, Depreciation, Provisions and Reserves
Unit 18 : Accounts of Non-trading Concerns – I
Unit 19 : Accounts of Non-trading Concerns – II,
Unit 20 : Depreciation – I
Unit 21 : Depreciation – II
Unit 22 : Provisions and Reserves

2. MCS - 011: Problem Solving and Programming 3 Credits

Objectives

The course is aimed to develop problem-solving strategies, techniques and skills that can be applied to computers and problems in other areas which give students an introduction to computer and analytical skills to use in their subsequent course work and professional development. Emphasis of this course is to act as an introduction to the thinking world of computers, to help students develop the logic, ability to solve the problems efficiently using C programming. Knowledge in a programming language is prerequisite to the study of most of computer science courses. This knowledge area consists of those skills and concepts that are essential to problem solving and programming practice independent of the underlying paradigm. The student will learn various concepts and techniques for problem solving and will implement those ideas using C programs.

Syllabus

BLOCK 1: An Introduction to C

Unit 1: Problem Solving

Problem - Solving Techniques, Steps for Problem – Solving, Using Computer as a Problem-Solving Tool, Design of Algorithms, Definition, Features of Algorithm, Criteria to be followed by an Algorithm, Top Down Design, Analysis of Algorithm Efficiency, Analysis of Algorithm Complexity, Flowcharts, Basic Symbols used in Flowchart Design

Unit 2: Basics of C

What is a Program and what is a Programming Language? C Language, History of C, Salient Features of C, Structure of a C Program, A Simple C Program, Writing a C Program, Compiling a C Program, Link and Run the C Program, Run the C Program through the Menu, Run from an Executable File, Linker Errors, Logical and Runtime Errors, Diagrammatic Representation of Program, Execution Process

Unit 3: Variables and Constants

Character Set, Identifiers and Keywords, Rules for Forming Identifiers, Keywords, Data Types and Storage, Data Type Qualifiers, Variables, Declaring Variables, Initialising Variables, Constants, Types of Constants

Unit 4: Expressions and Operators

Assignment Statements, Arithmetic Operators, Relational Operators, Logical Operators, Comma and Conditional Operators, Type Cast Operator, Size of Operator, C Shorthand, Priority of Operators

BLOCK 2: Control Statements, Arrays and Functions

Unit 5: Decision and Loop Control Statements

Decision Control Statements, The *if* Statement, The *switch* Statement, Loop Control Statements, The *while* Loop, The *do-while* Statement, The *for* Loop, The Nested Loop, The *Goto* Statement, The *Break* Statement, The *Continue* Statement

Unit 6: Arrays

Array Declaration, Syntax of Array Declaration, Size Specification , Array Initialization, Initialization of Array Elements in the Declaration, Character Array Initialization, Subscript, Processing the Arrays, Multi-Dimensional Arrays, Multi-Dimensional Array Declaration, Initialization of Two-Dimensional Arrays

Unit 7: Strings

Declaration and Initialization of Strings, Display of Strings Using Different Formatting Techniques, Array of Strings, Built-in String Functions and Applications, *Strlen Function, Strcpy Function, Strcmp Function, Strcat Function, Strlwr Function, Strrev Function, Strspn Function,* Other String Functions

Unit 8: Functions

Definition of a Function, Declaration of a Function, Function Prototypes, The Return Statement, Types of Variables and Storage Classes, Automatic Variables, External Variables, Static Variables, Register Variables, Types of Function Invoking, Call by Value, Recursion

BLOCK 3: Structures, Pointers and File Handling

Unit 9: Structures and Unions

Declaration of Structures, Accessing the Members of a Structure, Initializing Structures, Structures as Function Arguments, Structures and Arrays, Unions, Initializing an Union, Accessing the Members of an Union

Unit 10: Pointers

Pointers and their Characteristics, Address and Indirection Operators, Pointer Type Declaration and Assignment, Pointer Arithmetic, Passing Pointers to Functions, A Function Returning More than One Value, Function Returning a Pointer, Arrays and Pointers, Array of Pointers, Pointers and Strings

Unit 11: The C Preprocessor

 # define to Implement Constants, *# define* to Create Functional Macros, Reading from Other Files using *# include* ,Conditional Selection of Code using *#ifdef,* Using *#ifdef* for different computer types Using *#ifdef* to temporarily remove program statements, Other Preprocessor Commands, Predefined Names Defined by Preprocessor, Macros Vs Functions

Unit 12: Files

File Handling in C Using File Pointers, Open a file using the function fopen (*),* Close a file using the function fclose *( ),* Input and Output using file pointers, Character Input and Output in Files, String Input / Output Functions, Formatted Input / Output Functions, Block Input / Output Functions, Sequential Vs Random Access Files, Positioning the File Pointer, The Unbufferred I/O - The UNIX like File Routines

3. MCS-012: Computer Organisation and Assembly Language Programming 4 Credits

Objectives

In the modern era, Computer system is used in most aspects of life. You may use many different types of software on a computer system for particular applications ranging from simple document creation to space data processing. But, how does the Software is executed by the Computer Hardware? The answer to this basic question is contained in this Course. This course presents an overview of the Computer Organisation. After going through this course, you will not only acquire the conceptual framework of Computer Organisation and Architecture but also would be able to use the concepts in the domain of Personal Computers. In specific, you will be able to design digital circuits; describe the functions of various components of computers and their construction; and write simple assembly programs.

Structure

BLOCK 1: Introduction to Digital Circuits

UNIT 1: The Basic Computer

The von Neumann Architecture, Instruction Execution: An Example, Instruction Cycle Interrupts, Interrupts and Instruction Cycle, Computers: Then and Now, The Beginning, First Generation Computers, Second Generation Computers, Third Generation Computers, Later Generations

Unit 2: The Data Representation

Data Representation, Number Systems, Decimal Representation in Computers, Alphanumeric Representation, Data Representation for Computation, Error Detection and Correction Codes

Unit 3: Principles of Logic Circuits I

Logic Gates, Logic Circuits, Combinational Circuits, Canonical and Standard Forms, Minimization of Gates, Design of Combinational Circuits, Examples of Logic Combinational Circuits, Adders, Decoders, Multiplexer, Encoder, Programmable Logic Array, Read Only Memory ROM

Unit 4: Principles of Logic Circuits I

Sequential Circuits: The Definition, Flip Flops, Basic Flip-Flops, Excitation Tables, Master Slave Flip Flops, Edge Triggered Flip-flops, Sequential Circuit Design, Examples of Sequential Circuits, Registers, Counters – Asynchronous Counters, Synchronous Counters, RAM, Design of a Sample Counter

BLOCK 2: Basic Computer Organisation

Unit 1: The Memory System

The Memory Hierarchy , RAM, ROM, DRAM, Flash Memory, Secondary Memory and Characteristics, Hard Disk Drives, Optical Memories, CCDs, Bubble Memories, RAID and its Levels, The Concepts of High Speed Memories, Cache Memory, Cache Organisation, Memory Interleaving , Associative Memory, Virtual Memory, The Memory System of Micro-Computer

Unit 2: The Input/Output System

Input / Output Devices or External or Peripheral Devices, The Input Output Interface,
The Device Controllers and its Structure, Device Drivers, Input Output Techniques, Programmed Input /Output, Interrupt-Driven Input /Output, Interrupt-Processing, DMA (Direct Memory Access) Input Output Processors, External Communication Interfaces

Unit 3: Secondary Storage Techniques

Secondary Storage Systems , Hard Drives & Its Characteristics, Partitioning & Formatting: FAT, Inode, Drive Cache , Hard Drive Interface: IDE, SCSI, EIDE, Ultra DMA & ATA/66, Removable Drives, Floppy Drives, CD-ROM & DVD-ROM, Removable Storage Options, Zip, Jaz & Other Cartridge Drives, Recordable CDs & DVDs, CD-R vs CD-RW, Tape Backup

Unit 4: I/O Technology

Keyboard, Mouse , Video Cards, Monitors, Liquid Crystal Displays (LCD), Digital Camera, Sound Cards, Printers , Classification of Printers, Modems, Scanners, Scanning Tips, Power Supply, SMPS (Switched Mode Power Supply)

BLOCK 3: The Central Processing Unit

Unit 1: Instruction Set Architecture

Instruction Set Characteristics, Instruction Set Design Considerations, Operand Data Types, Types of Instructions, Number of Addresses in an Instruction, Addressing Schemes, Types of Addressing Schemes, Immediate Addressing, Direct Addressing, Indirect Addressing, Register Addressing, Register Indirect Addressing, Indexed Addressing Scheme, Base Register Addressing, Relative Addressing Scheme, Stack Addressing, Instruction Set and Format Design Issues, Instruction Length,

Allocation of Bits Among Opcode and Operand, Variable Length of Instructions, Example of Instruction Format

Unit 2: Registers, Micro-Operations and Instruction Execution

Basic CPU Structure, Register Organization, Programmer Visible Registers, Status and Control Registers, General Registers in a Processor, Micro-operation Concepts, Register Transfer Micro-operations, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Instruction Execution and Micro-operations, Instruction Pipelining

Unit 3: ALU Organisation
ALU Organisation, A Simple ALU Organization, A Sample ALU Design, Arithmetic Processors

Unit 4: The Control Unit

The Control Unit, The Hardwired Control, Wilkes Control, The Micro-Programmed Control, The Micro-Instructions, Types of Micro-Instructions, Control Memory Organisation, Micro-Instruction Formats, The Execution of Micro-Program

Unit 5: Reduced Instruction Set Computer Architecture

Introduction to RISC, RISC Architecture, The Use of Large Register File, Comments on RISC, RISC Pipelining

Block 4: Assembly Language Programming

Unit 1: Microprocessor Architecture

Microcomputer Architecture, Structure of 8086 CPU, Register Set of 8086, Instruction Set of 8086, Data Transfer Instructions, Arithmetic Instructions, Bit Manipulation Instructions, Program Execution Transfer Instructions, String Instructions, Processor Control Instructions,Addressing Modes, Register Addressing Mode, Immediate Addressing Mode, Direct Addressing Mode, Indirect Addressing Mode

Unit 2: Introduction to Assembly Language Programming

The Need and Use of the Assembly Language, Assembly Program Execution, An Assembly Program and its Components, The Program Annotation, Directives, Input Output in Assembly Program, Interrupts, DOS Function Calls (Using INT 21H), The Types of Assembly Programs, COM Programs, EXE Programs, How to Write Good Assembly Programs

Unit 3: Assembly Language Programming (Part – I)
Simple Assembly Programs, Data Transfer, Simple Arithmetic Application, Application Using Shift Operations, Larger of the Two Numbers, Programming With Loops and Comparisons, Simple Program Loops, Find the Largest and the Smallest Array Values, Character Coded Data, Code Conversion, Programming for Arithmetic and String Operations, String Processing, Some More Arithmetic Problems

Unit 4: Assembly Language Programming (Part – I)

Use of Arrays in Assembly, Modular Programming, The stack, FAR and NEAR Procedures, Parameter Passing in Procedures, External Procedures, Interfacing Assembly Language Routines to High Level Language, Programs, Simple Interfacing, Interfacing Subroutines With Parameter Passing, Interrupts, Device Drivers in Assembly

4. MCS-013: Discrete Mathematics 2 Credits

Objectives

Discrete mathematics, sometimes called finite mathematics, is the study of mathematical structure that are fundamentally discrete, in the sense of not supporting notion of continuity. A study of discrete sets has

become more and more necessary because of many application of Computer Science and various areas of engineering. Regarding computer science concept from discrete mathematics are useful to study or express objects or problems in computer algorithm and programming languages. For instance, to improve the efficiency of a computer programs, we need to study its logical structure, which involves a finite number of steps each requiring a certain amount of time. Using the theory of combinatory and graph theory, major areas of discrete mathematics, we can do this. Therefore, a study of these areas would complement and improve the understanding of courses based on algorithm and problem solving.

This course is designed to give basic concepts of propositions, predicates, Boolean algebra, logic circuit, sets, relations, functions, combinatorics, partitions and distributions.

Syllabus

Block 1: Elementary Logic

Unit 1: Prepositional Calculus

Propositions, Logical Connectives, Disjunction, Conjunction, Negation, Conditional Connectives, Precedence Rule, Logical Equivalence, Logical Quantifiers

Unit 2: Methods of Proof

What is a Proof? , Different Methods of Proof, Direct Proof, Indirect Proofs, Counter Examples, Principle of Induction

Unit 3: Boolean Algebra and Circuits

Boolean Algebras, Logic Circuits, Boolean Functions

Block 2: Basic Combinatorics

Unit 1: Sets, Relations and Functions

Introducing Sets, Operations on Sets, Basic Operations, Properties Common to Logic and Sets Relations, Cartesian Product, Relations and their types, Properties of Relations, Functions, Types of Functions, Operations on Functions

Unit 2: Combinatorics – An Introduction

Multiplication and Addition Principles, Permutations, Permutations of Objects not Necessarily Distinct, Circular Permutations, Combinations, Binomial Coefficients, Combinatorial Probability

Unit 3: Some More Counting Principles

Pigeonhole Principle, Inclusion-Exclusion Principle, Applications of Inclusion – Exclusion, Application to Surjective Functions, Application to Probability, Application to Derangements

Unit 4: Partitions and Distributions

Integer Partitions, Distributions, Distinguishable Objects into Distinguishable Containers, Distinguishable Objects into Indistinguishable Containers, Indistinguishable Objects into Distinguishable Containers, Indistinguishable Objects into Indistinguishable Containers

5. MCS-015: Communication Skills 2 Credits

Objectives

This course is aimed to develop the communication skills at the work place. In this course, we concentrate on English at the workplace. You are probably wondering whether business English (as it is also called) is a separate language to general English. Certainly not, business English is not a separate language. It is English used at the workplace using specific vocabulary, and in certain situations having a different

discourse. Every profession uses a certain 'jargon' and the business context in no different. While Business English is firmly rooted in general English, nevertheless there are certain distinguishing features which are evident. In this course, you will learn some theoretical inputs into the process of communication, its different types, the difference between written and oral communication. We then concentrate on the structure of conversation – its characteristics and conventions, effectively speaking over the telephone, preparing Curriculum vitae for jobs and interviews, preparing and participating in the Group Discussions, presentation skills, making negotiations and many more.

Syllabus

BLOCK 1: Skills Needed at the Work Place - I

Unit 1: The Process of Communication

Introduction: What is Communication?, The Process of Communication, Barriers to Communication, Different Types of Communication , Written vs. Oral Communication, Different Types of Face-to-Face Interactions, Characteristics and Conventions of Conversation, Conversational Problems of Second/Foreign Language Users, Difference between Conversation and Other Speech Events

Unit 2: Telephone Techniques

Warm Up, Speaking and Listening: Commonly Used Phrases in Telephone Conversations, Reading: Conference Calls, Vocabulary, Writing and Listening: Leaving a Message, Grammar and Usage: The Perfect Tenses, Pronunciation: Contracted Forms

Unit 3: Job Applications and Interviews

Warm up, Reading, Vocabulary: Apply for a Job, Curriculum Vitae, Language Focus: Some Useful Words, Study Skills: Preparing for an Interview, Listening, Speaking, Writing

Unit 4: Group Discussions

Reading, Writing Skills, Listening: How to be Successful in a Group Discussion, Study Skills, Language Focus, Vocabulary, Speaking, Grammar: Connectives, Pronunciation

Unit 5: Managing Organisational Structure

Warm Up: Ability to Influence and Lead, Reading: The Role of a Manager, Vocabulary: Leadership, Speaking and Listening, Language Focus: Degree of Probability, Grammar: Modals, Writing: Reports, Pronunciation

Unit 6: Meetings

Reading: A Successful Meeting, Speaking: One to One Meetings, Language Focus: Opening, Middle and Close, Study Skills: Editing, Listening: Criteria for Successful Meetings, Vocabulary, Grammar: Reporting Verbs, Writing: Memos, Pronunciation: Stress According to Part of Speech

Unit 7: Taking Notes and Preparing Minutes

Taking Notes, The Note-taking Skill: The Essential Components, The Note-taking Skill: An Example Preparing Minutes, Format of Minutes, Language and Style of Minutes, Grammar: Using the Passive Voice

Unit 8: Presentation Skills – I

Reading: Presentation Skills, Grammar: Verbs often required in Presentations, Language Focus, Listening: Importance of Body Language in Presentations, Speaking: Preparing an Outline of a Presentation, Pronunciation

Unit 9: Presentation Skills – II

Reading: Structure of Presentation, Study Skills: Visual Aids, Ending the Presentation, Language Focus: Talking about Increase and Decrease, Grammar: Prepositions, Listening: Podium Panic, Speaking, Pronunciation: Emphasizing the Important Words in Context

Unit 10: Negotiation Skills

Language Focus: Idiomatic Expressions, Study Skills: Process of Negotiations, Grammar: Phrasal Verbs, Listening: Effective Negotiations, Speaking, Writing

6. BCSL -021: C Language Programming Lab (Lab Course) 1 Credits

Objectives

This lab course is completely based on MCS-011 .The basic objective of the course is to provide the hands on experience on C Programming and improve the practical skill set. Also to apply all the concepts that has been covered in the theory course MCS-011. The learner will try to apply the alternate ways to provide the solution to a given problem. The learner will be able to develop the logic for the given problem, recognize and understand the syntax and construction of C code, gains experience of C , know the steps involved in compiling, linking and debugging C code, feel more confident about writing the C functions, write some complex programs

Syllabus

Section 1 C Programming Lab

- Salient Features of C
- C Programming Using Borland Compiler
- Using C with UNIX
- Running C Programs using MS Visual C++
- Program Development Life Cycle
- List of Lab Assignments – Session wise
-

7. BCSL -022: Assembly Language Programming Lab (Lab Course) 1 Credits

Objectives

This lab course is completely based on MCS-012.The basic objective of the course is to provide the hands on experience on Assembly language programming and improve the practical skill set. Also to apply all the concepts that have been covered in the theory course MCS – 012. The learner will try to apply the alternate ways to provide the solution to a given problem. The learner will be able to develop the logic for the given problem, recognize and understand the syntax and construction of Assembly language code, gains experience of Assembly language programming, know the steps involved in compiling, linking and debugging Assembly language Program.

Syllabus

Section 1 Digital Logic Circuits

- Logic Gates Circuit Simulation Program
- Making a Logic Circuit Using Logic
- A Revisit of Steps of Logic Circuit Design
- Session-wise problems

Section 2 Assembly Language Programming

- Assemblers
  - Turbo Assembler (TASM)
  - MASM
  - Emu 8086
  - The DEBUG Program
- Assembly Programming File
- Session-wise List of Programs

4.3 Detailed Syllabus of BCA Third Semester

1. MCS-014: Systems Analysis and Design 3 Credits

Objectives

The objectives of the course include the enabling of learner to identify the Software projects in an organization after studying various functionalities in the organization. Also, they should be able to structure various requirements, do the design and select the best method to develop the system. They should be able to implement and maintain the system. The learners should also get acquainted with different quality standards as well as learn about Management Information Systems.

Syllabus

Block 1: Introduction to Systems Development

Unit 1: Introduction to SAD

Fundamentals of System, Important Terms related to Systems, Classification of Systems, Real Life Business Subsystems, Real Time Systems, Distributed Systems, Development of a successful System, Various Approaches for development of Information Systems
Structured Analysis and Design Approach, Prototype, Joint Application Development

Unit 2: Systems Analyst-A Profession

Why do Businesses need Systems Analysts? Users, Analysts in various functional areas, Systems Analyst in Traditional Business, Systems Analyst in Modern Business, Role of a Systems Analyst Duties of a Systems Analyst, Qualifications of a Systems Analyst, Analytical Skills, Technical Skills, Management Skills, Interpersonal Skills

Unit 3: Process of System Development

Systems Development Life Cycle, Phases of SDLC, Project Identification and Selection, Project Initiation and planning, Analysis, Logical Design, Physical Design, Implementation, Maintenance, Product of SDLC Phases, Approaches to Development, Prototyping, Joint Application Design, Participatory Design, Case Study

Unit 4: Introduction to Documentation of Systems

Concepts and process of Documentation, Types of Documentation, System Requirements Specification, System Design Specification, Test Design Document, User Manual, Different Standard for Documentation, Documentation and Quality of Software, Good Practices for Documentation

Block 2: Planning and Designing Systems

Unit 5 : Process of System Planning

Fact finding Techniques, Interviews, Group Discussion, Site Visits, Presentations, Questionnaires, Issues involved in Feasibility Study, Technical Feasibility, Operational Feasibility, Economic Feasibility, Legal Feasibility, Cost Benefit Analysis, Preparing Schedule, Gathering Requirements of System, Joint Application Development, Prototyping

Unit 6: Modular and Structured Design

Design Principles, Top Down Design, Bottom Up Design, Structure Charts, Modularity, Goals of Design, Coupling, Cohesion

Unit 7: System Design and Modelling

Logical and Physical Design, Process Modeling, Data Flow Diagrams, Data Modeling, E-R Diagrams, Process Specification Tools, Decision Tables, Decision Trees, Notation Structured English, Data Dictionary

Block 3: More Design Issues and CASE Tools

Unit 8: Forms and Reports Design

Forms, Importance of Forms, Reports, Importance of Reports, Differences between Forms and Reports, Process of Designing Forms and Reports, Deliverables and Outcomes, Design Specifications, Narrative Overviews, Sample Design, Testing and Usability Assessment, Types of Information, Internal Information, External Information, Turnaround Document, General Formatting Guidelines, Meaningful Titles, Meaningful Information, Balanced Layout, Easy Navigation, Guidelines for Displaying Contents, Highlight Information, Using Colour, Displaying Text, Designing Tables and Lists, Criteria for Form Design, Organization, Consistency, Completeness, Flexible Entry, Economy, Criteria for Report Design, Relevance, Accuracy, Clarity, Timeliness, Cost

Unit 9: Physical File Design and Data base Design

Introduction to Database design, Flat files vs. Database, Steps in Database Design, E-R model to Database Design, Inputs to Physical Database Design, Guidelines for Database Design, Design of Data Base Fields, Types of Fields, Rules for Naming Tables and Fields, Design of Physical Records, Design of Physical Files, Types of Files, File Organization, Design of Database, Case Study

Unit 10: CASE Tools for Systems Development

Use of CASE tools by organizations, Definition of CASE Tools, Use of CASE tools by Organizations, Role of CASE Tools, Advantages of CASE Tools, Disadvantages of CASE Tools, Components of CASE, Types of CASE Tools, Classification of CASE Tools, Reverse and Forward Engineering, Visual and Emerging CASE tools, Traditional systems development and CASE based systems development, CASE environment, Emerging CASE Tools, Objected oriented CASE tools, Creating documentation and reports using CASE tools, Creating and executable prototype using Object Oriented CASE tools, Sequence Diagrams

Block 4: Implementation and Security of Systems & MIS

Unit 11: Implementation and Maintenance of Systems

Implementation of Systems, Conducting System Tests, Preparing Conversion Plan, Installing Databases, Training the end users, Preparation of User Manual, Converting to the new System, Maintenance of Systems, Different Maintenance activities, Issues involved in Maintenance

Unit 12: Audit and Security of Computer Systems

Definition of Audit, Objectives of Audit, Responsibility and Authority of the System Auditor, Confidentiality, Audit Planning, Audit of Transactions on Computer, Transaction Audit, Audit of Computer Security, Audit of Application, Benefits of Audit, Computer Assisted Audit Techniques, Audit Software, Test Data, Audit Expert Systems, Audit Trail, Computer System and Security issues, Analysis of Threats and Risks, Recovering from Disasters, Planning the contingencies, Viruses, Concurrent Audit Techniques, Need for Concurrent Audit, Techniques, An Integrated Test Facility, Techniques, The Snapshot Techniques, SCARF, Continuous and Intermittent, Simulation Technique

Unit 13: Management Information Systems

Role of MIS in an organization, Different kinds of Information Systems, Transaction Processing System, Management Information System, Decision Support System, Expert System

2. MCS-021: Data and File structures 4 Credits

Objectives

The learner should be well versed with the fundamentals of Algorithms, learn various data structures, should be able to use them appropriately as per need during development of programs. Also, the learner should know different sorting and searching techniques so that correct techniques can be used in different programs so that the complexity of the program does not increase due the sorting/ search technique employed. The learner should have the knowledge about file structures and finally, s/he should also know the concepts of advanced data structures.

Syllabus

BLOCK 1: Introduction to Algorithms and Data Structures

Unit 1: Analysis of Algorithms

Mathematical Background, Process of Analysis, Calculation of Storage Complexity, Calculation of Run Time Complexity

Unit 2: Arrays

Arrays and Pointers, Sparse Matrices, Polynomials, Representation of Arrays, Row Major Representation, Column Major Representation, Applications

Unit 3: Lists

Abstract Data Type-List, Array Implementation of Lists, Linked Lists-Implementation, Doubly Linked Lists-Implementation, Circularly Linked Lists-Implementation, Applications

Block-2: Stacks, Queues and Trees

Unit 4: Stacks

Abstract Data Type-Stack, Implementation of Stack, Implementation of Stack using Arrays, Implementation of Stack using Linked Lists, Algorithmic Implementation of Multiple Stacks, Applications

Unit 5: Queues

Abstract Data Type-Queue, Implementation of Queue, Array Implementation, Linked List Implementation, Implementation of Multiple Queues, Implementation of Circular Queues, Array

Implementation, Linked List Implementation of a circular queue, Implementation of DEQUEUE, Array Implementation of a *dequeue,* Linked List Implementation of *a dequeue*

Unit 6: Trees

Abstract Data Type-Tree, Implementation of Tree, Tree Traversals, Binary Trees, Implementation of Binary Tree, Binary Tree Traversals, Recursive Implementation of Binary Tree Traversals, Non Recursive Implementations of Binary Tree Traversals, Applications

BLOCK 3: Graph Algorithms and Searching Techniques

Unit 7: Advanced Trees

Binary Search Trees, Traversing a Binary Search Trees, Insertion of a node into a Binary Search Tree, Deletion of a node from a Binary Search Tree, AVL Trees, Insertion of a node into an AVL Tree, Deletion of a node from and AVL Tree, AVL tree rotations, Applications of AVL Trees, B-Trees, Operations on B-Trees , Applications of B-Trees

Unit 8: Graphs

Definitions, Shortest Path Algorithms, Dijkstra's Algorithm, Graphs with Negative Edge costs, Acyclic Graphs, All Pairs Shortest Paths Algorithm, Minimum cost Spanning Trees, Kruskal's Algorithm, Prims's Algorithm, Applications, Breadth First Search , Depth First Search, Finding Strongly Connected Components

Unit 9: Searching

Linear Search, Binary Search, Applications

BLOCK 4: File Structures and Advanced Data Structures

Unit 10: Sorting

Internal Sorting, Insertion Sort, Bubble Sort, Quick Sort, 2-way Merge Sot, Heap Sort, Sorting on Several Keys

Unit 11: Advanced Data Structures

Splay Trees, Splaying steps, Splaying Algorithm, Red-Black trees, Properties of a Red-Black tree, Insertion into a Red-Black tree, Deletion from a Red-Black tree, AA-Trees

Unit 12: File Structures

Terminology, File Organisation, Sequential Files, Structure, Operations, Disadvantages, Areas of use, Direct File Organisation, Indexed Sequential File Organisation

3. MCS 023: Introduction to Database Management Systems 3 Credits

Objectives

Database systems are pervasive. They are present in every segment of commercial, academic and virtual world. They are required as the backbone of any information system, enterprise resource planning, research activities and other activity that require permanence of data storage. This course provides the basic introduction to database system technologies; and concurrency, security and recovery issues of database management systems.

This course also provides the basic conceptual background necessary to design and develop simple database systems. The major focus in this course is the Relational database model; however, it also discusses about the ER model and distributed databases. This course enables you to write good queries using a standard query language called SQL.

Syllabus

BLOCK 1: The Database Management System Concepts

Unit 1: The Basic Concepts

Need for a Database Management System, The file based system, Limitations of file based system, The Database Approach, The Logical DBMS Architecture, Three level architecture of DBMS or logical DBMS architecture, Mappings between levels and data independence, The need for three level architecture, Physical DBMS Architecture, DML Precompiler, DDL Compiler, File Manager, Database Manager, Query Processor, Database Administrator, Data files indices and Data Dictionary, Commercial Database Architecture, Data Models

Unit 2: Relational and ER Models

The Relational Model, Domains, Attributes, Tuple and Relation, Super keys Candidate keys and Primary keys for the Relations, Relational Constraints, Domain Constraint, Key Constraint, Integrity Constraint, Update Operations and Dealing with Constraint Violations, Relational Algebra, Basic Set Operation, Cartesian Product, Relational Operations, Entity Relationship (ER) Model, Entities, Attributes, Relationships, More about Entities and Relationships, Defining Relationship for College Database, E-R Diagram, Conversion of E-R Diagram to Relational Database

Unit 3: Database Integrity and Normalisation

Relational Database Integrity, The Keys, Referential Integrity, Entity Integrity, Redundancy and Associated Problems, Single-Valued Dependencies, Single-Valued Normalisation, The First Normal Form, The Second Normal Form, The Third Normal Form, Boyce Codd Normal Form, Desirable Properties of Decomposition, Attribute Preservation, Lossless-join Decomposition, Dependency Preservation, Lack of redundancy, Rules of Data Normalisation, Eliminate Repeating Groups, Eliminate Redundant Data, Eliminate Columns Not Dependent on Key

Unit 4: File Organisation in DBMS

Physical Database Design Issues, Storage of Database on Hard Disks, File Organisation and Its Types, Heap files (Unordered files), Sequential File Organisation, Indexed (Indexed Sequential) File Organisation, Hashed File Organisation, Types of Indexes, Index and Tree Structure, Multi-key File Organisation, Need for Multiple Access Paths, Multi-list File Organisation, Inverted File Organisation, Importance of File Organisation in Databases

BLOCK 2: Structured Query Language and Transaction Management

Unit 1: The Structures Query Language

What is SQL? Data Definition Language, Data Manipulation Language, Data Control, Database Objects: Views, Sequences, Indexes and Synonyms, Table Handling, Nested Queries

Unit 2: Transactions and Concurrency Management

The Transactions, The Concurrent Transactions, The Locking Protocol, Serialisable Schedules, Locks Two Phase Locking (2PL), Deadlock and its Prevention, Optimistic Concurrency Control

Unit 3: Database Recovery and Security

What is Recovery? Kinds of failures, Failure controlling methods, Database errors, Recovery Techniques, Security & Integrity, Relationship between Security and Integrity, Difference between Operating System and Database Security, Authorization

Unit 4: Distributed and Client Server Databases

Need for Distributed Database Systems, Structure of Distributed Database, Advantages and Disadvantages of DDBMS, Advantages of Data Distribution, Disadvantages of Data Distribution, Design of Distributed Databases, Data Replication, Data Fragmentation, Client Server Databases,

Emergence of Client Server Architecture, Need for Client Server Computing, Structure of Client Server Systems, Advantages of Client Server Systems

BLOCK 3: Application Development: Development of a Hospital Management System

Need to Develop the Hospital Management System (An HMS), Creating a Database for HMS, Developing Front End Forms, Reports, Using Queries and Record set

BLOCK 4: Study Centre Management System: A Case Study

Software Development Process: Analysis, System Designing, Issues relating to Software Development, Testing and Maintenance

4. BCS-031: C++ Programming 3 Credits

Objective: The object oriented programming paradigm is one of the popular programming paradigms of today. Due to its characteristics object orientation has added new dimensions in the software development process. In this course concept of Object Oriented Programming (OOP) is introduced and for this purpose C++ programming language is being used. C++ a very powerful general purpose programming language, which supports object oriented programming paradigm. This course covers basics of C++ programming language which includes data types, variables, operators, and array and pointers. Also object oriented features such as class and objects, inheritance, polymorphism are covered in this course. Finally exceptions handling, I/O operations and STL are explained.

Block 1: Basics of Object Oriented Programming & C++

Unit 1: Object Oriented Programming
Structured vs. Object Oriented Programming, Object Oriented Programming Concepts, Benefits of Object oriented programming, Object Oriented Languages.
Unit2: Introduction to C++
Genesis of C++, Structure of a C++ program, Data Types, Operators and Control Structures.
Unit3: Objects and Classes
Classification, Defining Classes, Encapsulation, Instantiating Objects, Member Functions, Accessibility labels, Static Members.
Unit 4: Constructors and Destructors
Purpose of Constructors, Default Constructor, Parameterized Constructors, Copy Constructor, Destructor, Memory Management.

Block 2: Inheritance and Polymorphism in C++

Unit 1: Inheritance
Concept of Reusability, Types of Inheritance, Single and Multiple Inheritance, Multilevel Inheritance.
Unit 2: Operator Overloading
Function and Operator Overloading, Overloading Unary and Binary Operators.
Unit 3: Polymorphism and Virtual Function
Abstract Class, Function Overriding, Dynamic Binding, Pure Virtual Functions.

Block 3: Advanced Features of C++

Unit 1: Streams and Files
Stream Classes, Types of I/O, Formatting Outputs, File Pointers, Buffer.
Unit 2: Templates and STL
Function and Class Templates, Use of Templates, Standard Template Library.
Unit 3: Exception Handling
Exceptions in C++ Programs, Try and Catch Expressions, Exceptions with arguments.
Unit 4: Case Study
A Case Study to implement a real world problem.

5. BCSL-032: C++ Programming Lab 1 Credits

Objective: Objective of this course is to provide hands on experience to the learners in C++ programming. Learners will write program in C++ based on concepts learned in C++ programming course. In this course programming to be done for implementation of OO features such as class, objects, inheritance, polymorphism.

Syllabus and Sessions Allocation:

Session1: Basics of C++, data type, I/O, Control Structures etc., Session 2: Class and Objects, function calling, Session 3: Constructor and Destructor, Session 4: Inheritance, Session 5: Operator Overloading, Session 6: Polymorphism, Session 7: Template class and function, Session 8: I/O and streaming,Session9: Exception Handling,Session10:STL.

6. BMCSL-033 Data and File Structures Lab 1 Credit

Objectives: This lab is based on the courses MCS-021. This lab course involves the development of the practical skills in Data structures using C programming, Theoretical aspects were already covered in the respective theory courses. This course is an attempt to upgrade and enhance your theoretical skills and provide the hands on experience. By the end of these practical sessions of this course, you will be able to write programs using basic data structures such as Arrays etc. as well as advanced data structures such as trees etc.

Syllabus

SECTION 1: Data and File Structures Lab Manual

- Arrays
- Structures
- Linked Lists
- Stacks
- Queues
- Trees
- Advanced Trees
- Graphs
- Searching
- Sorting

7. BMCSL-034 DBMS Lab 1 Credit

Objectives: This lab is based on the courses MCS-023,. This lab course involves the development of the practical skills in DBMS using MS-Access , Theoretical aspects were already covered in the respective theory courses. This course is an attempt to upgrade and enhance your theoretical skills and provide the hands on experience. By the end of these practical sessions of this course, you will be able to create databases and use DBMS Tools in the areas of Database applications.

Syllabus

SECTION 1: DBMS Lab

- Introduction to MS-Access
- Database Creation
- Use of DBMS Tools/ Client-Server Mode
- Forms and Procedures

4.4 Detailed Syllabus of BCA Forth Semester

1. BCS-040: Statistical Techniques 4 Credits

BLOCK-1 STATISTICS AND PROBABILITY

Unit-1: Descriptive Statistics

Collecting Data, Kinds of Data, Frequency Distribution of a Variable, Graphical Representation of Frequency Distribution, Summarisation of Data, Measures of Central Tendency, Measures of Dispersion or Variability

Unit-2: Probability Concepts

Preliminaries, Trials, Sample Space, Events, Algebra of Events, Probability Concepts, Probability of an Event, Probability of Compound Events, Conditional Probability and Independent Events

Unit-3: Probability Distributions

Random Variable, Discrete Random Variable, Continuous Random Variable, Binomial Distribution, Poisson Distribution, Uniform Distribution, Normal Distribution

BLCOK-2 STATISTICAL INFERENCE

Unit-4: Sampling Distributions

Population and Samples, What is a Sampling Distribution, t-distribution, Chi-Square distribution F-distribution

Unit-5: Estimation

Point Estimation, Criteria For a Good Estimator, Interval Estimation, Confidence Interval for Mean with Known Variance, Confidence Interval for Mean with Known Variance, Confidence Interval for Proportion

Unit-6: Tests of Significance

Some Basic Concepts, Tests About the Mean, Difference in the Means of Two Populations Test About the Variance

Unit-7: Applications of Chi-Square in Problems with Categorical Data

Goodness-of-fit, Test of Independence

BLOCK-3 APPLIES STATISTICAL METHODS

Unit-8: Analysis of Variance: One-Way Classification

Analysis of Variance: Basic Concepts, Source of Variance, One-Way Classification
Model for One-Way Classification, Test Procedure, Sums of Squares, Preparation of ANOVA Table, Pairwise Comparisons, Unbalanced Data, Random Effects Model

Unit-9: Regression Analysis

Simple Linear Regression, Measures of Goodness of Fit, Multiple Linear Regression, Preliminaries, Regression with Two Independent Variables

Unit-10: Forecasting and Time Series Analysis

Forecasting, Time Series and Their Components ,Long-term Trend, Seasonal Variations ,Cyclic Variations, Random Variations/Irregular Fluctuations, Forecasting Models, The Additive Model, The Multiplicative Model, Forecasting Long-term Trends, The Methods of Least Squares, The Methods of Moving Averages, Exponential Smoothing

Unit-11: Statistical Quality Control

Concept of Quality, Nature of Quality Control, Statistical Process Control, Concepts of Variation, Control Charts, Control Charts For Variables, Process Capability Analysis, Control Charts For Attributes, Acceptance Sampling, Sampling Plan Concepts, Single Sampling Plans

BLCOK- 4 SAMPLING

Unit- 12: Simple Random Sampling and Systematic Sampling

Sampling- What and Why? Preliminaries, Simple Random Sampling, Estimation of Population Parameters Systematic Sampling, Linear Systematic Sampling, Circular Systematic Sampling, Advantages and, Limitations of Systematic Sampling

Unit-13: Stratified Sampling

Stratified Sampling, Preliminaries, Advantages, Estimation of population parameters, Allocation of sample size, Construction of strata, Post-Stratification

Unit-14: Cluster Sampling and Multistage Sampling

Cluster Sampling, Preliminaries, Estimation of population mean, Efficiency of cluster sampling Multistage sampling, Preliminaries, Estimation of mean in two stage sampling

2. MCS-024: Object Oriented Technology and Java Programming 3 Credits

Objectives: Today almost every branch of computer science is feeling presence of object- orientation. Object oriented technology is successfully incorporated in various fields of computer science. Since its arrival on the scene in 1995, the Java has been accepted as one of the primary programming language.

This course is designed to give you exposure to basic concepts of object-oriented technology. This course will help in learning to write programs in Java using object-oriented paradigm. Approach in this course is to take Java as a language that is used as a primary tool in many different areas of programming work.

Syllabus

BLOCK 1: Object Oriented Technology and Java

Unit 1: Object Oriented Methodology-1

Paradigms of Programming Languages, Evolution of OO Methodology, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs, Introduction to Common OO Language, Applications of OOPs.

Unit 2: Object Oriented Methodology-2

Classes and Objects, Abstraction and Encapsulation, Inheritance, Method Overriding and Polymorphism

Unit 3: Java Language Basics

Introduction To Java, Basic Features, Java Virtual Machine Concepts, A Simple Java Program, Primitive Data Type And Variables, Java Keywords, Integer and Floating Point Data Type, Character and Boolean Types, Declaring and Initialization Variables, Java Operators

Unit 4: Expressions, Statements and Arrays

Expressions, Statements, Control Statements, Selection Statements, Iterative Statements, Jump Statements, Arrays

BLOCK 2: Object Oriented Concepts and Exceptions Handling

Unit 1: Class and Objects

Class Fundamentals, Creating objects, Assigning object reference variables, Introducing Methods, Static methods, Constructors, Overloading constructors, This Keyword, Using Objects as Parameters, Argument passing, Returning objects, Method Overloading, Garbage Collection, The Finalize ( ) Method

Unit 2: Inheritance and Polymorphism

Inheritance Basics, Access Control, Multilevel Inheritance, Method Overriding, Abstract Classes, Polymorphism, Final Keyword

Unit 3: Packages and Interfaces

Package, Defining Package, CLASSPATH, Package naming, Accessibility of Packages, Using Package Members, Interfaces, Implementing Interfaces, Interface and Abstract Classes, Extends and Implements Together

Unit 4: Exceptions Handling

Exception, Handling of Exception, Using try-catch, Catching Multiple Exceptions, Using finally clause, Types of Exceptions, Throwing Exceptions, Writing Exception Subclasses

BLOCK 3: Multithreading, I/O and String Handling

Unit 1: Multithreaded Programming

Multithreading: An Introduction, The Main Thread, Java Thread Model, Thread Priorities, Synchronization in Java, Interthread Communication

Unit 2: I/O in Java

I/O Basics, Streams and Stream Classes, Byte Stream Classes, Character Stream Classes, The Predefined Streams, Reading from, and Writing to, Console, Reading and Writing Files, The Transient and Volatile Modifiers, Using Instance of Native Methods

Unit 3: Strings and Characters

Fundamentals of Characters and Strings, The String Class, String Operations, Data Conversion using Value Of ( ) Methods, String Buffer Class and Methods

Unit 4: Exploring Java I/O

Java I/O Classes and Interfaces, I/O Stream Classes, Input and Output Stream, Input Stream and Output Stream Hierarchy, Text Streams, Stream Tokenizer, Serialization, Buffered Stream, Print Stream, Random Access File

BLOCK 4: Applets Programming and Advance Java Concepts

Unit 1: Applets

The Applet Class, Applet Architecture, An Applet Skeleton: Initialization and Termination, Handling Events, HTML Applet Tag

Unit 2: Graphics and User Interfaces

Graphics Contexts and Graphics Objects, Color Control, Fonts, Coordinate System, User Interface Components, Building User Interface with AWT, Swing-based GUI, Layouts and Layout Manager, Container

Unit 3: Networking Features

Socket Overview, Reserved Parts and Proxy Servers, Internet Addressing: Domain Naming Services (DNS), JAVA and the net: URL, TCP/IP Sockets, Datagrams

Unit 4: Advance Java

Java Database Connectivity, Establishing A Connection, Transactions with Database, An Overview of RMI Applications, Remote Classes and Interfaces, RMI Architecture, RMI Object Hierarchy, Security, Java Servlets, Servlet Life Cycle, Get and Post Methods, Session Handling, Java Beans

3. BCS-041: Fundamental of Computer Networks 4Credits

Objectives: This course introduces the basics of data communication and networking. Students will develop an understanding of the general principles of data communication and networking as used in networks. It also includes an activity of setting up a small local area network. The goal of this course is that the student

will develop an understanding of the structure of network, its elements and how these elements operate and communicate with each other.

BLOCK 1: CONCEPTS OF COMMUNICATION AND NETWORKING

Unit1: Basics of Data Communication

Concept of communication system, Analog and Digital Communication, Data communication modes, Synchronous and asynchronous transmission, Simplex, half-duplex, full duplex communication ,Networking Protocols and Standards, Layering, OSI reference model, encapsulation, End-to-end argument. Protocol design issues, Applications.

Unit 2: Modulation and Encoding

Analog Modulation (AM, FM, PM), AM Demodulation (one technique only), Advantages and Disadvantages of each., Analog to Digital (Digitization), Sampling, Quantization, Digital to Analog., Digital Modulation (ASK, FSK, PSK, QPSK)

Unit 3: Multiplexing and Switching

Concept, FDM, TDM, SDM, Multiplexing Applications, Circuit and Packet Switching

Unit 4: Communication Mediums

Digital data transmission, Serial and Parallel Transmission, Guided and Unguided mediums, Wireless Communication, Coaxial Cables, Twisted Pair Cables, Fiber Optic Cables, Connectors

BLOCK 2: NETWORKS and DEVICES

Unit 1: Network Classifications and Topologies

Network Concept, LAN overview, LAN Topologies, LAN access methods, Network Types based on size like PAN, LAN, MAN, WAN, Functional Classification of Networks, Peer to Peer, Client Server. Wide Area Network, WAN Topologies, WAN Access Methods.

Unit 2: OSI and TCP/IP Models

Introduction of OSI Model, Need of such Models, Basic functions of each OSI layer, Introduction to TCP/IP, Comparisons with TCP/IP layers. (At the beginner's level)

Unit 3: Physical and Data link Layer

Error detection and correction, CRC, Framing, Retransmission strategies, Multi-access communication, CSMA/CD, Ethernet, Addressing, ARP and RARP.

Unit 4: Internetworking Devices

Network Interface Cards, Modems, Repeaters, Hubs, Bridges, Switch (L2 and L3 differences) and gateways

BLOCK 3: NETWORK, TRANSPORT and APPLICATION LAYER

Unit 1: Network layer

Circuit and packet switching, Routing, Congestion control, Routing protocols: distance vector vs link-state routing, DV problems, Network Addressing, Forwarding, Fragmentation, Error Messaging Services.

Unit 2: Transport layer

Addressing and multiplexing, Flow control, congestion control, data transport, Port numbers, service models, Intro to reliability, QoS.

Unit3: Application Layer

DNS, Remote Logging, File transfer, Network Management, client-server applications, WWW, E-mail, MIME

Unit4: Network Applications

Internet Applications like emails, chatting, social networking, Rail Reservations, Information Sharing, e-governance, Online Processing and Collaborations, etc. ,Mobile Applications

BLOCK 4: NETWORK DESIGN and SECURITY

Unit 1: Building a Simple Network

Examples of designing the developing small networks, Structure Cabling, Integrating home computers and devices, creating a small Networking

Unit 2: Introduction to Network Architectures

X.25, Frame relay, Telephone network, ATM network, ISP, IPv4 and IPv6 overview

Unit 3: Introduction to Wireless and Mobile Networks

Introduction to wireless communication systems, modern wireless communication systems and generations, Introduction to cellular mobile systems, CDMA, cellular system design fundamentals.

Unit 4: Network Security

Introduction to computer security, Security services, Authentication and Privacy, Block and Stream Ciphers, Public and Private key Cryptography, Introduction to RSA, MD5 and DES at the beginner's level.

4. BCS-042: Analysis and Design of Algorithms 2 Credits

Objectives: To learn about properties of algorithm and how to design an algorithm
Discuss asymptotic notations , Design and measure time complexity analysis of searching, sorting and Graph traversal algorithms. Make comparison of different type of algorithm likes Linear, Quadratic, Polynomial and Exponential, Describe how greedy approach facilitate solving the problem. Discuss Divide and Conquer approach for solving the problem

Block-1 Introduction to Algorithm

Unit1: Basics of an Algorithm

Definition and Example of an algorithm, Characteristics of an algorithm, Steps in Designing of Algorithms, Growth of function, Recurrence, Problem Formulation (Tower of Hanoi),Substitution Method ,Iteration Method, Master Method

Unit2: Asymptotic Bounds

Asymptotic Notations, Concept of efficiency of analysis of an algorithm
Comparative efficiencies of algorithms: Linear, Quadratic, Polynomial and Exponential

Unit3: Analysis of simple Algorithms

Euclid's algorithm for GCD, Horner's Rule for polynomial evaluation, Simple Matrix (n x n) Multiplication, Exponent evaluation e.g. $a^{n,}$ Searching, Linear Search, Sorting, Bubble sort, Insertion Sort, Selection sort

Block 2: Design Techniques

Unit 1: Greedy Technique

Elements of Greedy strategy, Activity Selection Problem ,Continuous Knapsack Problem, Coin changing Problem, More Examples

Unit 2: Divide and Conquer Approach

General Issues in Divide and Conquer, Binary Search, Merge Sort, Quick Sort, Integer Multiplication, More Examples

Unit 3: Graph Algorithm

Representation of Graphs, Adjacency Matrix, Adjacency List, Depth First Search and Examples, Breadth First Search and Examples

5. MCSL-016: Internet Concepts and Web design (Lab Course) 2 Credits

Objectives: The main objective of the course is to introduce the whole range of web technologies starting from HTML, DHTML, Java Script, VBScript, and Dreamweaver. It also gives a brief description on Internet. Through the various examples the course will describe how to design specific page, dynamic web page, forms and frames. It also focuses on the practical aspects of these technologies.

Syllabus

BLOCK 1: Scripting Languages

Unit 1: The Internet

Classification of Networks, Networking Models, What is Packet Switching, Accessing the Internet, Internet Protocols, Internet Protocol (IP), Transmission Control Protocol (TCP), Internet Address, Structure of Internet Servers Address, Address Space, How does the Internet work, Intranet & Extranet, Internet Infrastructure, Protocols and Services on Internet, Domain Name System, SMTP and Electronic Mail, Http and World Wide Web, Usenet and Newgroups, FTP, Telnet, Internet Tools, Search Engines, Web Browser

Unit 2: Introduction to HTML

What is HTML, Basic Tags of HTML, HTML Tag, TITLE Tag, BODY Tag, Formatting of Text, Headers, Formatting Tags, PRE Tag, FONT Tag, Special Characters, Working with Images, META Tag

Unit 3: Advanced HTML

Links, Anchor tag, Lists, Unordered Lists, Ordered Lists, Definition Lists, Tables, TABLE, TR and TD Tags, Cell Spacing and Cell Padding, Colspan and Rowspan, Frames, Frameset, FRAME Tag, NOFRAMES Tag, Forms, FORM and INPUT Tag, Text Box, Radio Button, Checkbox, SELECT Tag and Pull Down Lists, Hidden, Submit and Reset, Some Special Tags, COLGROUP, THREAD, TBODY, TFOOT, _blank, _self, _parent, _top, IFRAME, LABEL, Attribute for <SELECT>, TEXTAREA

Unit 4: Introduction to JavaScript

JavaScript Variables and Data Types, Declaring Variables, Data Types, Statements and Operators, Control Structures, Conditional Statements, Loop Statements, Object-Based Programming, Functions, Executing Deferred Scripts, Objects, Message box in JavaScript, Dialog Boxes, Alert Boxes, Confirm Boxes, Prompt Boxes, JavaScript with HTML, Events, Event Handlers, Forms, Forms Array

Unit 5: VB Script

What is VBScript? Adding VBScript Code to an HTML Page, VB Script Basics, VBScript Data Types, VBScript Variables, VBScript Constants, VBScript Operators, Using Conditional Statements, Looping Through Code, VBScript Procedures, VBScript Coding Conventions, Dictionary Object in VBScript, Methods: VBScript Dictionary Object, VBScript Dictionary Object Properties, Err Object, Methods: VBScript Err Object, Properties: VBScript Err Object

Unit 6: Dreamweaver

Using Dreamweaver, Create a Site Home Page, Design a Page in Layout View, Insert Images, Insert Text, Work in Standard View, View the Site Files, Link your Documents

BLOCK 2: Lab Manual

Section 1: HTML (Hypertext Markup Language)

- Basic of HTML
- How to Create HTML Document
- Steps for Creating a Simple HTML Program

Section 2: Advanced HTML

- Advanced Topics of HTML

Section 3: JavaScript

- Script Basics
- Incorporating JavaScript into a Web Page

Section 4: VBScript

- VBScript Basics
- Incorporating VBScript into HTML Page

Section 5: Dreamweaver

- How to Work in Dreamweaver??
- How to save your file?
- Adding Layers to the Timeline and Giving Motion to the Layer
- Inserting Scripts
- Inserting External Media in the Web Page
- Adding SSI(Server-side include to the Page)
- Adding CSS Style to your Page
- Adding XML Files to your Page
- To Export a Dreamweaver Document as XML File, checking entries, working in frames, windows control, the Java script URL.

6. BCSL-043: Java Programming Lab 1 Credits

Objectives

This lab is based on the course MCS-024. This lab course involves the development of the practical skills in Java Programming. Theoretical aspects were already covered in the respective theory courses. This course is an attempt to upgrade and enhance your theoretical skills and provide the hands on experience in Java programming. By the end of these practical sessions of this course, you will be able to write programs using java programming language.

SECTION 1: Java Programming Lab

- Programming with Java
- PATH and CLASSPATH Setting
- Example Programs
- List of Lab Assignments

7. BCSL-044: Statistical Techniques Lab: 1 Credit

This course is based on Statistical Techniques course.
Objectives: This lab course will provide opportunity to the learners to implement the concepts and techniques learned in Statistical Techniques course in C/C++ Language and/or in MS-Excel.

Session wise coverage:
Session 1: Frequency distribution, central tendency and dispersion

Session 2,3,4: Hypothesis testing, t distribution, chi square distribution, f distribution, normal distribution
Session5: Regression and correlation coefficient-univariate, multivariate
Session6: Anova test
Session 7: Central charts
Session 8: Time series
Session 9, 10: Sampling for a problem domain and analyse –Case Study

8. BCSL-045: Analysis and Design of algorithms Lab 1 Credit

This course will cover practical implementations of several algorithms covered in BCS-042 course.

4.5 Detailed Syllabus of BCA Fifth Semester

1. BCS-051: Introduction to Software Engineering 3 Credits

Objectives:

After studying the course, the student should:
(a) Be able to develop SRS as per any of the existing standards
(b) Know various Function and Object oriented modeling & design techniques
(c) Know various testing techniques
(d) Know different Software Development Life Cycle models
(e) Know the concepts of Software Project Management

Block-1: Development of SRS

Unit-1: Characteristics of SRS
Completeness, Unambiguity, Inconsistency, IEEE SRS

Unit-2: Function oriented Modeling
DFD, ERD, Structure Chart, SRS, Data Dictionaries

Unit-3: Object Oriented Modeling
UML Introduction, Use Case Diagrams, Class Diagrams

Block-2: Design and Testing

Unit-1: Function Oriented Design
Constructing solution to problem, Identifying components and their interaction, Visualizing the solution, Characteristics of a good function oriented design (Coupling, Cohesion etc.)

Unit-2: Object Oriented Design
Identification & Specification problem domain static objects, Working out the application logic objects, Identification of necessary utility objects, Methodology of identification of objects, Case Study

Unit-3: Testing Techniques
Different testing techniques with examples

Unit-4: Development and Execution of test cases
Debugging, Testing tools & Environments, Types of test cases and test plans

Block-3: Software Engineering Concepts
Unit-1: Software Development Models

Program vs Software ,Definition of Software Engineering, SDLC models

Unit-2: Software Project Management Concepts

Planning, Execution, Monitoring, Control of Software Projects, Software Metrics, Application of PERT and GANTT charts

Unit-3: Software Engineering Fundamentals

Software Configuration Management, Software Maintenance, Software Quality Assurance

2. BCS-052: Network Programming and Administration 3 Credits

BLOCK 1: TCP/IP PROTOCOLS

UNIT 1: INTRODUCTION TO TCP/IP

Origin of TCP/IP and Internet, Communication ,Why do we Need the Internet, Need of Protocol on Communication, Problems in Computer Communication, Dealing with Incompatibility, A Brief History of the Internet, Architecture of the Internet, TCP/IP Layer and Protocols, Network Access Layer, Internet Layer, Need for IP Address, Classes of IP Address, Special Meanings, Who Decides the IP Addresses, Internet Protocol, Address Resolution Protocol (ARP),Reverse Address Resolution Protocol (RARP), Internet Control Message Protocol (ICMP), Transport Layer, Transmission Control Protocol, User Datagram Protocol (UDP), Application Layer, Electronic Mail, Domain Name System (DNS), How does the DNS Server Works? Simple Network Management Protocol (SNMP), Remote Login: TELNET, World Wide Web: HTTP, Networking Example

UNIT 2: INTERNET PROTOCOL

Overview of Internet Protocol, IP Header, IP Address, IP Address Classes, Subnet Masks and CIDR Networks (Classless IP Addresses), Internet-Legal Versus Private Addressing, IP Routing, Routing Protocol, Routing Algorithms

UNIT 3: TRANSPORT LAYER PROTOCOLS

Overview of TCP, Transmission Control Protocol (TCP), TCP Header, TCP Connection Establishment and Termination, TCP Connection Establishment, TCP Connection Termination, User Datagram Protocol (UDP)

UNIT 4: APPLICATION LAYER PROTCOLS

Domain Name System (DNS), Hierarchical Name Space, Domain Servers, How does DNS Work in Internet, Domain Name Resolution, Messages Used in DNS, Dynamic DNS (DDNS), Electronic Mail, Simple Mail Transfer Protocol (SMTP),Message Transfer Agent, User Agent, Post Office Protocol (POP), Internet Mail Access Protocol (IMAP),Multipurpose Internet Mail Extension (MIME), Telnet , File Transfer Protocol (FTP)

BLOCK 2: FUNDAMENTALS OF TCP/IP PROGRAMMING

UNIT 1: TCP/IP PROGRAMMING **CONCEPTS**

Client Server Communication, Designing Client/Server Programs, Socket Concepts, IP Address and Ports, Byte Ordering, Sketch of Networking Connection, Active and Passive Sockets, Socket Fundamentals, Networking Example

UNIT 2: SOCKET INTERFACE

Elementary Socket System Calls, Socket System Call, Bind System Call, Connect System Call, Listen System Call, Accept System Call, Elementary Data Transfer Calls, Closing a Socket, TCP and UDP Architectures, Networking Example

UNIT 3: SOCKET PROGRAMMING

Advance System call, Data Transfer, Byte Operations and Addressing, Socket Options, Select System Call Raw Socket, Multiple Recipients, Unicasting, Broadcasting, Multicasting, Quality of Service Issues

BLOCK 3: NETWORK ADMINISTRATION USING LINUX

UNIT 1: INTRODUCTION TO NETWORK ADMINISTRATION

Role and responsibilities of Network Administrator, Linux and TCP/IP Internetworking concepts, Using Network Clients ,Understanding System Initialization ,Use Remote Administration Services and Tools

UNIT 2: NETWORK ADMINISTRATION ACTIVITIES

Managing software packages and File systems, Managing users, System and kernel management Basic Troubleshooting

UNIT 3: NETWORK CONFIGURATION AND SETTING

Configuring Networks, Dynamic Host Configuration Protocol, Domain Name System (DNS), Network File System (NFS), Web Server (Prefer Samba Server)

UNIT 4: NETWORK MANAGEMENT AND SECURITY

Networks and Security, User Security Management, Disk Security Management, Security Configuration and Analysis, Account Policies, Permissions and Restrictions, Configuring Network Settings, Advance Troubleshooting

3. BCS -053: Web Programming 2 Credit

Objectives: After going through this course a student should be able to:

- Use XHTML tags to create simple static web pages
- format a simple Web page using Cascading Style sheets
- state the concepts applicable to web programming
- create an interactive and dynamic Web site using JavaScript
- represent data over the Web using XML
- appreciate the use of Ajax and Rich Internet Applications
- perform server side scripting using Java Server Pages (JSP)

Block 1: Client Side

Unit 1: Web 2.0 and XHTML

What Is Web 2.0? Introduction to Web 2.0 terms: Search, Content Networks, Blogging, Social Networking, Social Media, Rich Internet Applications (RIAs), Web Services, Mashups, Widgets and Gadgets, Introduction to XHTML and WML, Syntactic Differences between HTML and XHTML, Standard XHTML Document Structure, An example of XHTML covering Basic Syntax, Images, Hypertext Links, Lists and Tables, Creation of an XHTML Form, Internal Linking and Meta Elements

Unit 2: Using Style Sheets

CSS: Inline Styles, Embedded Style Sheets, Linking External Style Sheets, Style Specification Formats Selector Forms, Colour, Property Value Forms, Font Properties, List Properties, Alignment of Text, The Box Model, Background Image ,The and Tags

Unit 3: Introduction to XML

XML Basics, XML Document Structure, XML Namespaces, Document Type Definitions, XML Schemas, Displaying XML Documents

Unit 4: Programming with JavaScript – DOM and Events

The Document Object Model, Element Access in JavaScript, Traversing and Modifying a DOM Tree, DOM Collections and Styles, Events, Examples of Event Handling from Body, Button, Text Box and Password Elements, Dynamic Documents using JavaScript – element moving, visibility, positioning etc., Example program (s),Introduction and example of AJAX

Unit 5: Introduction to WAP and WML

WAP and WML Basics, WML formatting and links, WML input, WML tasks, WML timer, WML variables, Example

Block 2: Server Side

Unit 1: The Server Side Scripting

Server side scripting and its need ,Two-Tier, Three-Tier, N-Tier and Enterprise Architecture, Various Languages/ Technologies for server scripting ,HTTP Methods (such as GET, POST, HEAD, and so on) , Purpose ,Technical characteristics, Method selection, Use of request and response primitives, Web container – Tomcat

Unit 2: JSP – Basic

Basic JSP Lifecycle, JSP Directives and Elements, Scriptlets, Expressions, Action Elements, Standard Actions, Comments and Template Data, JSP variables, The out Object, Request, response, sessions and application objects

Unit 3: JSP – Applications

Exceptions and exception handling using JSP, Cookies and sessions, Managing Email using JSP

Unit 4: JSP Application Development

Example applications using JSP, What is JDBC? Need for JDBC, Database Drivers, Connection using JDBC API, Application development and deployment

4. BCS-054: Computer Oriented Numerical Techniques 3 Credits

Introduction and Objectives: In today's world the practical problems are quite complex and it may not be possible to find their analytical solutions. Hence we have to resort to computer oriented numerical methods for solving them. Numerical analysis provides knowledge of various techniques to get mathematical entities involved in solving the problems.

Block 1: Computer Arithmetic and Solution of Linear and Non-linear Equations

Unit 1: Computer Arithmetic

Floating–Point Arithmetic and Errors, Rounding and Chopping of a Number and Associated Errors, Floating Point Representation of Numbers, Truncation errors and Taylor's Series

Unit 2: Solution of Linear Algebraic Equations

Preliminaries, Direct Methods, Gauss Elimination Method (Basic), Gauss Elimination Method (Row Interchanges: Pivotal condensation),Iterative Methods, Gauss Jacobi Iterative Method, The Gauss-Seidel Iteration Method, Comparison of Direct and Iterative Methods

Unit 3: Solution of Non-linear Equations

Non Linear Equations, Solution of Non Linear Equations, Successive Substitution Method(Fixed point method), Bisection Method ,Newton-Raphson Method, Regula-falsi Method, Secant Method

Block 2: Interpolation

Unit 1: Operator

What is Interpolation, Some Operators and their Properties, Interrelation between operators, Applications of operators on some functions

Unit 2: Interpolation with Equal Intervals

Difference Table, Interpolation Methods, Newton Forward Difference Formula, Newton Backward Difference Formula, Central Difference Formula, Stirling's Formula, Bessle's Formula

Unit 3: Interpolation with Unequal Intervals

Lagrange's Method, Divided Difference Method, Divided Difference Table, Newton's Divided Difference Method

Block 3: DIFFERENTIATION, INTEGRATION AND DIFFERENTIAL EQUATIONS

Unit 1: Numerical Differentiation

Differentiation by Forward/Backward Difference Formula, Differentiation by Central Difference Formula

Unit 2: Numerical Integration

Methodology's of Numerical Integration, Rectangular Rule, Trapezoidal Rule, Simpsons (1/3) Rule

Unit3: Ordinary Differential Equation

Initial Value and Boundary Value Problem, Euler's Method, Improved Euler's Method, Runge Kutta (R-K) Methods (of Order 2 and 4)

5. BCS-055: Business Communication 2 Credits

Objectives:

- Making students aware of the importance of social skills in business.
- Preparing them for the job market.
- Sensitizing them to implications of communicating in multi-cultural settings.
- Making students aware of difference between oral & written communication.
- Facilitating understanding & practice of in company and external business correspondence.
- Dealing with requirements of effective reports & proposals.

- Developing editing skills
- Learning to summaries.

Block 1: Business Social Skills & the Recruitment Process

Unit 1: Greetings & Introductions
Small talk, Corporate Entertainment

Unit 2: Company Profiles / Jobs & responsibilities

Unit 3: Getting Ready for the Job Market
Preparing a Portfolio,
Unit 4: Responding to Advertisements
Writing a CV / Resume, Covering Letter, Accepting & Declining Job Offers

Unit5: Interviews
Preparing for Interviews, Face to face Interviews, Phone & walk in Interviews
Group Discussions, Presentations for Recruitment

Unit 6: Communicating Across Cultures

Language & Culture, Business Travel, Business Events – IT Trade Fairs & Conferences

Block 2: Business Writing

Unit 1: Features of Written & Oral Communication

Making a choice, In Company Communication: notices, notes, messages, memos, e mails etc

Unit 2: External Communication

Types of Letters, faxes, e mails, Conventions & Practices

Unit 3: Writing Reports

Types of reports – Informative & analytical, Contents & Structures

Unit 4: Writing Proposals

Basic Features, Types of proposals

Unit 5: The Process of Writing

Editing Skills – correction of errors, eliminating superfluities, Summarizing

6. BCSL-056: Network Programming and Administration Lab 1 Credit

Section 1: Introduction to UNIX
Overview of Unix,Unix Commands
Section 2: Introduction to Linux
Overview of Linux,Exploring Desktop,Using the Shell,Understanding users and file systems, Understanding text processing,Managing processes
Section 3: Network Programming Using C
Introduction to C
Section 4: Network Programming and Administration Exercises

Lab Sessions

7. BCSL-057- Web programming Lab:

This lab course is **of 1Credit**, based on course Web programming.

Session wise coverage:
Session 1: Using Web 2.0 and creating pages using XHTML
Session 2: Creating Style Sheets for the web pages created in session
Session 3: Creating sample XML document and displaying it
Session 4: WML
Session 5 and 6: Using and writing JavaScript in web pages, including events and Ajax
Session 7, 8: Using JSP
Session 9, 10: Writing simple applications using JSP and JDB and deploying it

8. BCSL-058: Computer Oriented Numerical Techniques Lab: 1Credit

This course is based on Computer Oriented Numerical Techniques

Objectives: This lab course will provide opportunity to the learners to implement the concepts and techniques learned in course Computer Oriented Numerical Techniques in C/C++ Language and/or in MS-Excel/Any Spread Sheet.

Session wise coverage:
Session 1,2,3: for Based on problems discussed in Block 1
Session 4,5,6: for Based on problems discussed in Block 2
Session 7,8,9,10: for Based on problems discussed in Block 3

4.6 Detailed Syllabus of BCA Sixth Semester

1. BCS-062: E-Commerce 2 Credits

Objective: The Objectives of the Course are:

1. To make the student aware about the basics of E-commerce, its processes and some of the services/products supporting these processes
2. After studying this course, the students shall be able to understand the basic related business processes like B2B, C2B & B2C involved in the area of E-Commerce with an overview of the technical support for the processes.

Block – 1: E-Commerce Concept and Models

Unit 1: Introduction to E-Commerce

Definition and scope of E-Commerce and M-Commerce, E-Commerce trade cycle, Electronic Markets, Internet Commerce, Benefits and Impacts of E-Commerce

Unit 2: Elements of E-Commerce

Various elements, e-visibility, e-shops, Delivery of goods and services, Online payments, After-sales services, Internet E-Commerce security

Unit 3: EDI and Electronic Payment Systems

Introduction and definition of EDI, EDI layered Architecture, EDI technology and standards, EDI communications and transactions, Benefits and applications of EDI with example, Electronic Payment Systems: credit/debit/smart cards, e-credit accounts, e-money

Unit 4: Introduction to EC models

Inter-organization and intra-organization E-Commerce, E-Commerce Models: B2B, B2C, C2B, C2C, G2C, C2G

Block – 2: Practices in E-Commerce

Unit 5: E-Business

Introduction to Internet bookshops, Grocery Suppliers, Software Supplies and support, Electronic newspapers, Virtual auctions, Online share dealing, e-diversity

Unit 6: E-Security and Legal Issues

Security concerns in E-Commerce, Privacy, integrity, authenticity, non-repudiation, confidentiality, SSL, Digital Signatures and fire walls, IT Act 2000,Cyber crimes and cyber laws

Unit 7: Mobile Commerce and Future of E-Commerce

Introduction to Mobile Commerce, Benefits of Mobile Commerce, Impediments of M-Commerce, M-Commerce framework, Emerging and future trends

Unit 8: Case Study

2. MCS-022: Operating System concepts and Networking Management 4 Credits

Objectives: This course is intended to introduce the concepts, structure, features, trends and design mechanism of Operating system. The Operating System has seen consistent innovations and developments like other fields of computer science. In this course efforts have been to capture these changes. The trend is towards GUI based free, platform independent, secure and network-based operating system. Linux and Windows 2000 have got very wide coverage in the course. Security and network management, a part of modern Operating System design, have also been taken up.

Syllabus

BLOCK 1: Operating System Fundamentals Networking

Unit 1: Graphical User Interface

What is Graphical User Interface, Evolution of Human and Machine Interaction, Common Graphical User Interfaces, Functionality of Graphical User Interface, GUI Design Consideration: psychological factors, GUI Design Consideration: standards, GUI Example, Microsoft Windows, Macintosh Toolbox, X-windows, NeXT

Unit 2: Introduction to Operating System

What is an Operating System? Evolution of Operating System, Serial Processing, Batch Processing, Multiprogramming, Operating System Structure, Layered Structure Approach, Virtual Machine, Client-Server Model, Kernel Approach, Classification of Advanced Operating System, Architecture Driven Operating System, Application Driven Operating System, Characteristics of Modern Operating System, Microkernel Architecture, Multithreading, Symmetric Multiprocessing

Unit 3: Introduction to Networking Concepts

Why Computer Networks, The Topologies, Characteristics of the OSI Layers, OSI Models and Communication between Systems, Interaction between OSI Model Layers, Protocols Types of Networks, Local Area Network (LANs), Metropolitan Networks (MANs), Wide Area Network (WANs), Medium, Data Flow, Physical Connection, Transmission Media, Connecting Devices, Repeaters, Hubs, Bridges, Routers, Gateways

Unit 4: Internetworking: Concept,
Architecture and Protocols
History of internetworking, Packet Switching, Internetworking Concepts, Internet Addresses Object-Based Programming, Configuring IP Addresses, TCP/ IP, Additional TCP/ IP – Related Protocols, Application Layer Protocols, File Transfer Protocols, Trivial File Transfer Protocol (TFTP), TELNET, Remote login, Electronic Mail (Email),World Wide Web, Domain Name System, SNMP and UDP

BLOCK 2: Linux Operating System

Unit 1: Introduction to Linux Operating System

Features of Linux, Drawbacks of Linux, Components of Linux, Memory Management Subsystems, Linux Process and Thread Management, File Management System, Device Drivers

Unit 2: Linux Commands and Utilities

Entering the Machine, User Names and Groups, Logging In, Correcting Typing Mistakes, Format of Linux Commands, Changing Your Password, Characters with Special Meanings, Linux Documentation, The File System, Current Directory, Looking at the Directory Contents, Absolute and Relative Pathnames, Some Linux Directories and Files

Unit 3: Linux Utilities and Editor

Some Useful Commands, Permission Modes and Standard Files, Pipes, Filters and Redirection, Shell Scripts, Graphical User Interface, Editor

Unit 4: User-to-User Communication

On-Line Communication, Off-Line Communication, Apache Server Settings, Network Server Settings, Domain Name Server, Network File Server

Unit 5: UNIX System Administration

System Administration, Installing Linux, Choosing an Installation Method, Choosing an Installation Class, Pre-installation checks, Installation, Booting the System, Maintaining User Accounts, File Systems and Special Files, Backups and Restoration

BLOCK 3: Windows 2000

Unit 1: Windows 2000 Networking

Windows 2000 Operating System Architecture, Peer-To-Peer Network, Domains, Network Protocols, File Services, Shared Folders, Distributed File System, Print Services, Using the Mapped Drive, Printing a Mapped Drive, Disconnecting a Mapped Drive, Viewing Directory Information, Creating a Shared Folder, Logging off a Client, A Few Important Facts About Windows 2000 Usages

Unit-2: Managing Windows 2000 Server

Using Windows 2000 and Client, Logging on to the Network, Browsing Network Resources 1, Accessing Network Resources Using My Network Places, Mapping a Folder

Unit3: Advanced Windows 2000 Networking

Windows 2000 Domains, Workgroups & Trusted Relationships, Concept of Domains, Trust Relationships, Building Domains, User Administration, Remote Access

Unit 4: Windows XP Networking

Introduction to Windows XP Networking, TCP/IP Protocol Setting for Windows XP, To Select a Network Protocol, Virtual Private Networks and Remote Networking, Windows XP in File System, Sharing Network Resources in Windows XP, Sharing Files in Windows XP, Sharing Folders in Windows XP, Sharing Drives in Windows XP, Enabling Offline File Features

Block 4: Security and Management

Unit 1: Security Concepts

Goals of Computer Security, Integrity, Confidentiality, Availability, Security Problem and Requirements, Identifying the Assets, Identifying the Threats, Identifying the Impact, Threat and Vulnerabilities, User Authentication, Security System and Facilities, System Access Control, Password Management, Privileged User Management, User Account Management, Data Resource Protection, Sensitive System Protection, Cryptography, Intrusion detection, Computer-Security Classifications

Unit 2: Computer Security

Hardening Operating System and Application Code, Hardening File System Security, Hardening Local Security Policies, Hardening Services, Hardening Default Accounts, Hardening Network Activity, Malicious Code, Firewall, Fault Tolerant System, BACKUP and UPS

Unit 3: Security and Management-I

Main Issues In Windows Security Management, Physical Security Management, Logon Security Management, Users and Groups Management, Managing Local and Global Groups, Managing User Accounts, Windows NT Domain Management, Domain Controller, The Primary Domain Controller (PDM), Backup Domain Controller (BDC), Windows Resources Management**,** Registry Management, Removing Registry Access, Managing Individual Keys, Audit Registry Access, Printer Management, Managing Windows 2000 Operating System, Active Directory, Logical Structure, Physical Structure, Windows 2000 DNS Management, Managing Group Policy

Unit 4: Security and Management-II

User Authentication Management, Subsystems Component Management, Kerberos Management, User and Group Management, Configuring User Accounts, Creating Domain User Accounts, Managing Logon Hours, Managing Expiry Date for a User Account, Windows 2000 Groups Management, Default Group Types, Security Configuration Management Tool, Resource Management, Files and Folder Management, Files and Folder Permission, Inheritances and Propagation, Moving Data and Permission, Shared Resources Management, The NULL Session, Registry Management, Default Registry Configurations, Registry Backup Managements, Printer Security Management, Windows 2000 Network – Security and Management, NAT and ICS, RRAS, RADIUS and IAS, IPSec, Encrypting File System Management, Encrypting File System (EFS), EFS and Users Management, Data Recovery Management, EFS Cryptography Management

BCSL-063: Lab (Operating System concepts and Networking Management) 1 Credits

Objectives : This lab is based on the course MCS-022. This lab course involves the development of the practical skills in OS and Networking. Theoretical aspects were already covered in the respective theory courses. This course is an attempt to upgrade and enhance your theoretical skills and provide the hands on experience. By the end of these practical sessions of this course, you will be able use Unix and Linux OS commands, write scripting and Installation and Configuration of the networking services like TCP/IP, DNS, DHCP, FTP, SMTP etc.

Syllabus

SECTION 1: Operating Systems and Networking Lab

- Overview of Windows 2000
- Unix and Linux
- Advanced concepts of Local Area Network
- Network administration of Windows 2000
- LINUX administration
- Unix Networking
- Installation and Configuration of the networking services like TCP/IP, DNS, DHCP, FTP, SMTP

BCSP-064: Project 8 Credits

The objective of the BCA project work is to develop a quality software solution by following the software engineering principles and practices. During the development of the project the students should involve in all the stages of the software development life cycle (SDLC). The main objective of this project course is to provide learners a platform to demonstrate their practical and theoretical skills gained during five semesters of study in BCA Programme. During project development students are expected to define a project problem, do requirements analysis, systems design, software development, apply testing strategies and do documentation with an overall emphasis on the development of a robust, efficient and reliable software systems. The project development process has to be consistent and should follow standard.. For example database tables designed in the system should mach with the E-R Diagram. SRS documents to be created as per IEEE standards.

Students are encouraged to spend maximum time of the sixth semester working on a project preferably in a software industry or any research organization. Topics selected should be complex and large enough to justify as a BCA final semester project. The courses studied by the students during the BCA Programme provide them the comprehensive background knowledge on diverse subject areas in computer science such as computer programming, data structure, DBMS, Computer Organization, SAD, Software Engineering, Computer Networks etc., which will be helping students in doing project work. . ***Student will receive Project Guidelines along with their 5th semester course material. Students should strictly follow and adhere to the BCSP-064 project guidelines.***

5. EVALUATION SCHEME

Completion of the programme requires successful completion of both assignment component and the Term-end Examination component for each of the course's in the programme. The total numbers of courses in this BCA programme are **39 and the total number of credits is 99**.
Evaluation for each course covers two aspects:

(a) Continuous evaluation through **Assignment with a weightage of 25%** (please refer to the table below). *Viva- voce is compulsory for all the Asignments for which 20 marks are allocated.*
(b) **Term-end examination with a weightage of 75%** (please refer to the table below).

Note: ***A learner should not apply for appearing at the term-end examination of any course without getting registered for the same and that if s/he does so, her/his result would not be declared and the onus shall be on him.***

5.1 Assignments and Term - End Examination

The main purpose of assignments is to test student's comprehension of learning the materials they receive from the University and also to help them get through the courses by providing feedback to them. The information given in the printed course materials should be sufficient for answering the assignments. However, as the Computer Science is ever enhancing area, the students should make
an attempt and work with extra reading material easily available in the study centre / Regional Centre libraries or through websites for working on the assignments. This will enhance your learning capabilities. Mostly the assignments are designed in such a way as to help you concentrate mainly on the printed course material, exploit their personal experiences and apply the knowledge gained from various sources.

5.2 Assignments

There will be **only one assignment for each course worth 100 marks (weightage of 25%)** except FEG-02,ECO-01and ECO-02. The set of all the assignments for each semester are given in one booklet that student will get along with the course material as well as the same will be uploaded on the IGNOU's website also. For FEG-02,ECO-01 and ECO-02 assignment and term end examination weightage is **30:70.**

The viva voce is compulsory for the assignment evaluation:

Viva-voce is compulsory for all the Assignments for which 20 marks are allocated. For any course, in case, if a student submitted the assignment and not attended the viva-voce, then the assignment is treated as **not successfully completed** and would be marked as **ZERO.**

Unfair means in attempting the assignments

As per IGNOU Norms(If the learners copy the assignments, which is an important component of the ODL system, such assignments will be awarded "zero" and direct such students to re-attempt the fresh assignments pertaining to the next year which will indirectly delay the award of degree by a semester / year.)

5.3 Evaluation and Marking Scheme for BCA

Table shown below is the detailed marking scheme for the BCA courses.

Semester	Course Code	Course Title	Credits	Continuous Evaluation Assignment (Weightage – 25%)		Term End Examination Theory OR Practicals* (for Lab courses only) (Weightage – 75%)		
				Max. Marks	*Min. Marks*	*Duration*	*Max. Marks*	*Min. Marks*
I	* FEG-02	Foundation course in English -2	4	100	35	2	50	17.5
	*ECO-01	Business Organization	4	100	35	2	50	17.5
	BCS-011	Computer Basics and PC Software	3	100	40	3	100	40
	BCS-012	Basic Mathematics	4	100	40	3	100	40
	BCSL-013	Computer Basics and PC Software Lab	2	100	40	2	50	20
II	* ECO-02	Accountancy-1	4	100	35	2	50	17.5
	MCS-011	Problem Solving and Programming	3	100	40	3	100	40

	MCS-012	Computer Organization and Assembly language Programming	4	100	40	3	100	40
	MCS-013	Discrete Mathematics	2	100	40	2	50	20
	MCS-015	Communication Skills	2	100	40	2	50	20
	BCSL-021	C Language Programming Lab	1	50	20	1	50	20
	BCSL-022	Assembly Language Programming Lab	1	50	20	1	50	20
III	MCS-021	Data and File Structures	4	100	40	3	100	40
	MCS-023	Introduction to Database Management Systems	3	100	40	3	100	40
	MCS-014	Systems Analysis and Design	3	100	40	3	100	40
	BCS-031	Programming in C++	3	100	40	3	100	40
	BCSL-032	C++ Programming Lab	1	50	20	1	50	20
	BCSL-033	Data and File Structures Lab	1	50	20	1	50	20
	BCSL-034	DBMS Lab	1	50	20	1	50	20
IV	BCS-040	Statistical Techniques	4	100	35	2	50	17.5
	MCS-024	Object Oriented Technologies and Java Programming	3	100	40	3	100	40
	BCS-041	Fundamentals of Computer Networks	4	100	40	3	100	40
	BCS-042	Introduction to Algorithm Design	2	100	40	2	50	20
	MCSL-016	Internet Concepts and Web Design	2	100	40	2	50	20
	BCSL-043	Java Programming Lab	1	50	20	1	50	20
	BCSL-044	Statistical Techniques Lab	1	50	20	1	50	20
	BCSL-045	Algorithm Design Lab	1	50	20	1	50	20
V	BCS-051	Introduction to Software Engineering	3	100	40	3	100	40
	BCS-052	Network Programming and Administration	3	100	40	3	100	40
	BCS-053	Web Programming	2	100	40	2	50	20
	BCS-054	Computer Oriented Numerical Techniques	3	100	40	3	100	40
	BCS-055	Business Communication	2	100	40	2	50	20
	BCSL-056	Network Programming Lab	1	50	20	1	50	20
	BCSL-057	Web Programming Lab	1	50	20	1	50	20
	BCSL-058	Computer Oriented Numerical Techniques Lab	1	50	20	1	50	20
IV	BCS-062	E-Commerce	2	100	40	2	50	20
	MCS-022	Operating System Concepts and Networking Management	4	100	40	3	100	40
	BCSL-063	Operating System Concepts and Networking Management Lab	1	50	20	1	50	20
	BCSP-064	Project**	8					

Note:

i) No practical examinations in the non-lab courses. Practical examination will be conducted in the lab courses only. The letter 'L' in the course code represents the lab course. Pass in each and every section in the practical course of Term End Practical Examination is compulsory to in order to declare it successful in the respective course.

ii) * For these courses existing rules of the university will be applicable.

iii) **The Project consist of 2 components namely project report evaluation and viva. Viva-voce is compulsory and forms part of evaluation. A student in order to be declared successful in the project must secure 40% marks in each component (i) Project Evaluation and (ii) Viva-voce. Maximum Marks for project report will be 150 and for Viva-Voce Maximum Marks will be 50.To Pass the project course one need to score minimum 60 marks in Project Report and minimum 20 marks in Viva-Voce.

iv) In general Term End Theory Exam for a theory course of 3 credit or more will be of 3 hours and Max Marks of 100 and Term End Theory Exam for a theory course of 2 credit or more will be of 2 hours and Max Marks of 50.

v) Term End Practical Exam for a Lab course of 1 credit will be of 1 hour and Max Marks of 50 and Term End Practical Exam for a Lab course of 2 credit will be of 2 hour and Max Marks of 50

vi) *For FEG-02,ECO-01 and ECO-02 maximum marks and duration will be as per existing rule of the University.

In order to be able to appear for the Term-end examination, it is a requirement that the student submit all the assignments according to the prescribed schedule. All students will be required to give an undertaking to this effect, and should it be later found that they had in fact not submitted the assignments as prescribed; the results for the Term-end examination will be treated as cancelled.

Additional guidelines for Lab Course Assignments and TEE

The following are the evaluation guidelines for the lab courses.

(i) Evaluation of Assignments for Lab Courses

The assignments of lab courses consist of three parts:

- Continuous assessment of practical sessions (lab records) (total 40 marks),
- Assignment questions (total 40 marks)
- A combined comprehensive **viva-voce** worth 20 marks

The minimum passing marks are overall (lab records + problems + viva) **40% in each assignment**.

In order to be able to appear for the Term-end examination, it is a requirement that the student submit all the assignments according to the prescribed schedule. All students will be required to give an undertaking to this effect, and should it be later found that they had in fact not submitted the assignments as prescribed; the results for the Term-end examination will be treated as cancelled.

Viva-voce is compulsory for all the Assignments for which 20 marks are allocated.

The marks allotment details for various lab courses are shown in the following table:

Course code	**Continuous assessment of practical sessions lab records (40)**	**Assignment problems (40)**	**Combined Viva (20)**	**Total marks (100)**
BCSL-013	Section –1(20) Section –2(20)	Section –1(20) Section –2(20)	20	100
BCSL-021	Section –1(40)	Section –1(40)	20	100
BCSL-022	Section –1(40)	Section –1(40)	20	100

BCSL-032	Section –1(40)	Section –1(40)	20	100
BCSL-033	Section –1(40)	Section –1(40)	20	100
BCSL-034	Section –1(40)	Section –1(40)	20	100
BCSL-016	Section –1(20) Section –2(20)	Section –1(20) Section –2(20)	20	100
BCSL-043	Section –1(40)	Section –1(40)	20	100
BCSL-044	Section –1(40)	Section –1(40)	20	100
BCSL-045	Section –1(40)	Section –1(40)	20	100
BCSL-056	Section –1(40)	Section –1(40)	20	100
BCSL-057	Section –1(40)	Section –1(40)	20	100
BCSL-058	Section –1(40)	Section –1(40)	20	100
BCSL-063	Section –1(40)	Section –1(40)	20	100

It is to be noted that minimum passing marks are overall (lab records + problems + viva) **40% in each assignment**.

(ii) Evaluation of Term-end practical exam for Lab Courses

Practical questions –80 % and Viva-voce – 20 %

Note: The term-end examination of a practical courses consists of **Practical questions –80 % and Viva-voce – 20 %. To pass a practical course one need to score minimum 40% marks.**

5.3 Instructions for Assignments

While answering Assignments, the following guidelines are required to be followed:

1. Tips for assignments

The word limits for answering most of the questions are mentioned with them if no word limit is prescribed, and then assume it to be about 300 words. You will find it useful to keep the following points in mind:

(i) **Planning:** Read the assignment carefully. Go through the units on which they are based. Make some points regarding each question and rearrange these in logical order.

(ii) **Organisation:** Be a little more selective and analytical before drawing up a rough outline of your answer. In an essay-type question give adequate attention to your introduction and conclusion. The introduction must offer brief interpretation of the question and how you propose to develop it. The conclusion must summarize your response to the question. Make sure that your answer:

(a) is logical and coherent;
(b) has clear connection between sentences and paragraphs;
(c) is written correctly giving adequate consideration to your expression, style and presentation;
(d) does not exceed the number of words indicated (if any) in your questions.

(ii) **Presentation:** Once you are satisfied with your answers, you can write down the final version for submission, writing each answer neatly and underlining the points you want to emphasize.

2. The following format is to be followed for submission of the assignment:

   The top of the first page of your response sheet for each assignment should look like this:

PROGRAMME TITLE :	ENROLMENT No. : .....
COURSE CODE :	NAME : .....
COURSE TITLE :	ADDRESS: .....
ASSIGNMENT CODE :	SIGNATURE : .....
STUDY CENTRE :	DATE : .....

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4. Read instructions for submission of assignments given here. The assignments response sheets should be hand written. However the s/w coding, snapshots, test cases etc. can be in the printed form. **Students should not reproduce their answers from the units sent to them by the University. If they reproduce from the units, they will get poor marks for the respective question**.
5. The students should write each assignment separately. All the assignments should not be written in continuity.
6. **The students should write the question number with each answer. Photocopy of the submitted assignment is to be retained by the student for his or her own record and future reference, if any.**
7. The students should use only A4 size paper for their response and tag all the pages carefully. Avoid using very thin paper. They should allow a 4-cm. margin on the left and at least 4 lines in between each answer. This may facilitate the evaluator to write useful comments on the margins at appropriate places.
8. **The students should not copy the assignments from others. If copying is noticed, the assignments of such students will be rejected, and disciplinary action will be taken against the students as per rules of the University.**
9. **The completed assignment response should be sent to the Coordinator of the Study Centre**. **Under no circumstances should they be sent to the (SR&E) Division or the School at Headquarters**, for evaluation. After submitting the assignment at the Study Centre in person, the students should get the acknowledgement from the Co-ordinator on the prescribed assignment-cum-acknowledgement card (**Form No. 1**) otherwise, the assignment response should be sent under certificate of posting through post. The students should get back evaluated assignments from their study centres within one month of its submission for the feedback and for their future guidance.
10. In case the student has requested for a change of Study Centre, s/he should submit her/his Assignments only to the original Study Centre until the University effects the change of Study Centre.

5.4 Guidelines Regarding the Submission of Assignments

1. It is compulsory for the students to submit all the prescribed assignments. They will not be allowed to appear for the term-end examination of a course if they do not submit the specified number of assignments in time for that course.
2. Whenever the students receive a set of assignments, they should check them immediately and ask for missing pages, if any, from Registrar (MPDD), IGNOU, Maidan Garhi, New Delhi-110 068 or the Co-ordinator of the study centre or else **download them from the IGNOU website**.

3. The assignment responses should be complete in all respects. Before submission, the students should ensure that they have answered all the questions in all assignments. Incomplete answer sheets bring poor grades.

4. The Coordinator of the Study Centre has the right to reject the assignments received after the due date. Therefore, the students are advised to submit their assignments before the due date.

5. Students should enclose a self-addressed stamped assignment remittance-cum-acknowledgement card **(Form No. 1)** with each assignment response to ensure the delivery of assignments before the last dates prescribed for submission of assignments.

6. In case any student fails to submit the assignments or fails to score minimum qualifying marks, s/he has to wait for fresh assignments meant for the current batch of students. The request for the new assignments in the prescribed form **(Form No. 2)** is to be addressed to the Registrar, MPDD, Indira Gandhi National Open University, Maidan Garhi, New Delhi-110068.

7. For their own record, students should retain a photocopy of all the assignment responses, which they submit to the Co-ordinator of their Study Centre. If they do not get back their duly evaluated ASSIGNMENT within a month after submission, they should try to get it from their Study Centre personally. This may help them to improve upon future assignments.

8. As per the University norms, once the student's scores pass marks in an assignment, they can not re-submit it for improvement of marks.

9. Assignments are not subject to re-evaluation except for factual errors, if any. The discrepancy noticed by the students in the evaluated assignments should be brought to the notice of the Co-ordinator of the Study Centre, so that he forwards the correct score to the SR&E Division at the Headquarters.

10 The students should not enclose or express doubts for clarification, if any, along with the assignments. They should send their doubts in a separate cover to the Registrar, SR&E Division, Indira Gandhi National Open University, Maidan Garhi, New Delhi - 110 068. While doing so they should give their complete Enrolment number, name, address, programme code.

> ***Note* : Please submit your Assignments on or before the due date at your study centre.**

11. In case of not successfully completed or missed; the assignments should be demanded only, if your registration for that course is valid.

12. Assignments should not be demanded to improve your score if you have secured minimum qualifying score in a course.

13. Please do not submit your assignment responses twice either at the same Study Centre or at different Study Centres for evaluation.

5.5 General Guidelines Regarding the Term-End Examination

1. To be eligible to appear the Term-end Examination in any course, the students are required to fulfil the following conditions:

   (a) they should have paid the fee due for that semester
   (b) they should have opted and pursued the prescribed course
   (c) they should have submitted the examination form in time along with the requisite fees.
   (d) they should have submitted the required number of assignments within due dates before taking the examination
   (e) their registration for the programme should be valid.

2. The University conducts term-end examinations twice a year, in June and December. The student can take the examination only after the minimum period prescribed for the course of study has elapsed.

3. Examination date schedule indicating the date and time of examination for each course is sent to all the study centres in advance. The same is also notified through IGNOU Newsletter from time to time and also will be displayed on the IGNOU's website also.

4. The examination form can be obtained from the concerned Regional Centre/Study Centre. Also the student can submit the on-line examination form. The fees and the guidelines are given below:

Guidelines and instructions for submission of online examination form

i) Students are required to pay examination fee **@Rs.60/- per course** if the student is appearing for the first time or failed earlier examinations for theory as well as practical**.** Payment can be made through Credit Card, Cash deposit at any branch of AXIS Bank (UTI Bank) or through Demand Draft. Please choose the suitable option for payment.

ii) No Examination Fee is required to be paid for the courses, where results of Term-end examination are awaited on the date of submission of examination form. Results of Term-end examination are available on University website www.ignou.ac.in. Please see result status before filling up the examination form.

iii) Select and enter Programme code and Examination Centre Code from the options available. If the centre opted by the student is not activated as examination centre or not allotted for any other reason, alternative examination centre will be allotted.

iv) Select courses carefully. Courses for theory as well as practical needs to be selected separately from the list appearing on the screen.

v) If you wish to submit on-line form and make payment through Credit Card, please note the auto generated control No. for reference.

vi) In case, you wish to submit on-line form and deposit payment by cash deposit at any of the AXIS (UTI) branches, please fill on-line examination form and submit after selecting this option. You are required to take printout of challan automatically generated and deposit required amount at AXIS Bank along with the challan. You need not send anything by post.

OR

In case, you wish to submit on-line form and make payment through a bank draft, please select this option. Please keep the bank draft particulars ready with you before starting to fill the form and enter same at the appropriate place and submit. Students can purchase Demand Draft from any branch of AXIS Bank (UTI Bank) without any commission charge. Please keep note of computer generated control number for your reference for any correspondence. You are required to send demand draft to Registrar, SE Division, Block-12, IGNOU, Maidan Garhi, New Delhi- 110 068 by Registered Post or Speed Post. You must mention your Enrol. No., Programme Name, and Computer generated control No. on the back side of the Demand Draft. Demand Draft is to be drawn in favour of IGNOU and payable at New Delhi only.

vii) You will receive an acknowledgement with control number at the E.mail address given in the application form

viii) You may visit SEARCH OPTION after 24 hours of submission of your form (leaving the day of submission except Saturday & Sunday) to see the details of particulars submitted by you. In case you find the particulars are not available, you may submit the form again.

ix) University issues hall-ticket to the students two weeks before commencement of Term-end Examination and also uploads the information on the University website. If you do not receive hall-ticket one week before commencement of examination, please download the hall-ticket from the website and report to the Examination Centre with your Identify Card issued by the University.

x) Students will be allowed to appear in Term-end Examination for those courses only whose registration is valid and have completed the prescribed minimum duration of study.

5. **Date of Submission of Examination Forms**

The dates for submission of Examination forms for June and December Term-end Examinations are mentioned hereunder:

Date of submission of examination forms for June TEE	**Late Fee**	**Date of submission of examination forms for December TEE**	**Late Fee**
1st March to 31st March*****	NIL	1st September to 30th September*****	NIL
1st April to 20 April*****	Rs.100/-	1st October to 20 October*****	Rs.100/-
21st April to 15th May******	Rs.500/-	21st October to 15th November******	Rs.500/-
16th May to 28th May******	Rs.1000/-	16th November to 28th November******	Rs.1000/-

** Examination forms to be submitted at the following Address:*
The Registrar (SED)
Block-12, IGNOU
Maidan Garhi
New Delhi – 110068.

*** During these dates submit the Examination Form with late fee to concerned Regional Centre (Outside Delhi), Exam for these students will be conducted at Regional Centre city only. For Delhi submit to the Registrar (SED).*

6. Please see the instructions printed overleaf the examination form before filling it.
7. Students should carry their **Identity Card and intimation slip** (received from SR&E Division indicating Centre & Date of Examination) to the Examination Centre.
8. In case a student fails to receive the intimation slip 15 days before the commencement of the examination, they should get in touch with the Study Centre/Regional Centre/SR&E at Headquarters indicating their enrolment no., name, address and programme.
9. The students will be entitled to appear for the examination only at the study centre **OR** at the examination centre allotted to them and **NOT** at any other centre without specific permission from the University. The Examination Centre once opted for in a form shall not be changed.
10. All the Study Centres/Regional Centres concerned will get a copy of the term-end examination result and also you can download it from our website under the "Student Support" Option.
11. Although all efforts will be made to declare the results in time, there will be no binding on the University to declare the results of the last examination before the commencement of next examination. The students may, therefore, fill up the examination form without necessarily waiting for the result and

get it cancelled at a later date, if so desired. In case the student gets result after filling up the exam form, s/he should not re-appear in the course qualified by her/ him with a view to improve the qualified score.

12. The students can get their Term-end Examination result reevaluated. They should apply in prescribed form (**Form No. 3**) and **(Form No.4).** Fee at the rate Rs.300/- for reevaluation is charged per course. This amount is refunded if there is a mistake in checking of answer-book.

13. Duplicate Grade Card/marks sheet will be issued on a request from the students in prescribed form (**Form No. 4**) against payment of Rs. 100/- by Demand Draft drawn on IGNOU, New Delhi. The duplicate grade card will be sent by Post to the student.

14. Students who fail to complete the minimum required number of course(s) prescribed for the Programme within the allotted period of study shall cease to be on the rolls of this University for that programme till they re-enroll themselves, if they wish to do so. For completing re-registration students are advised to get in touch with the Regional Director concerned.

15. **Early Declaration of Results**

In order to facilitate the students who have got offer of admission and or selected for employment etc and are required to produce marks-sheet/grade card by a specified given date may apply for early process of their answer-scripts and declaration of the results for this purpose. The students are required to apply in the specified format available on the University website with a fee of Rs.500/- per course through Bank Draft drawn in favour of IGNOU along with the attested photocopy of the offer of admission/employment offer. The students can submit their requests for early declaration before the commencement of the Term-end Examination i.e., before 1st June and 1st December respectively. The University in such cases will make arrangements for processing the answer-scripts and declare the results as a special case.

16 **Re-evaluation of Answer-script(s)**

The University has replaced the scheme of rechecking with the re-evaluation where by the answer-scripts will be re-evaluated by another Evaluator in case the students are not satisfied with the marks/grades secured by them in Term-end Examination. Such students can apply for re-evaluation within one month from the date declaration i.e. the date on which the results are made available on the University Website on payment of Rs.300/- per course in the prescribed application form available on the University Website. The better of the two courses or original marks/grades and re-evaluated marks/grades will be considered and the revised marks/grades shall be incorporated in the students' record as applicable and the revised grade card/marks sheet will be sent to the students within one month from the receipt of application. Re-evaluation is not permissible for Projects, Practical, Assignments and Seminars etc.

17 **Improvement of Division/Class**

Keeping the interest of students who have completed their Bachelors Degree and Masters Degree Programmes, but falling short of 2% marks for securing 1st Division/2nd Division the university has made a provision for allowing such students to improve their performance. The improvement is permissible only in theory papers and the students may apply for improvement of their performance on the prescribed application format along with a fee of Rs.300/- per course through a Bank Draft drawn in favour of IGNOU payable at Delhi and submit the application and fee to the Registrar, SRE Division, IGNOU, Maidan Garhi, New Delhi.

The improvement is not permitted to those students who have completed their maximum duration of the programme including the re-admission period has expired. The students will be given only one opportunity to improve the marks/grades and they can apply for improvement a maximum of 25% of the credits for successful completion of the respective programme. However, the sealing for the number of courses in which the student can improve is five courses. The better of the two examinations i.e., marks already awarded and the marks secured in the improvement examination will be considered.

6. OTHER USEFUL INFORMATION

6.1 Reservation of Seats

The University provides reservation of seats for Scheduled Castes, Scheduled Tribes and Physically Handicapped students as per the Government of India rules.

6.2 Scholarships and Reimbursement of Fee

Reserved Categories, viz., Scheduled Castes, Scheduled Tribes and Physically Handicapped students etc. have to pay the fee at the time of admission to the University along with other students. Physically Handicapped students admitted to IGNOU are eligible for Government of India scholarships. They are advised to collect scholarship forms from the respective State Government Directorate of Social Welfare or Office of the Social Welfare Officer and submit the filled-in forms to them **through the Regional Director of IGNOU concerned.**

Similarly, SC/ST students have to submit their scholarship forms to the respective State Directorate of Social Welfare or Office of the Social Welfare Officer, **through the Regional Director of IGNOU concerned for suitable reimbursement.**

6.3 Change / Correction of Address

There is a proforma **(Form No. 6)** for change / correction of address available in this programme guide. This form duly filled in is to be submitted to the **Regional Director concerned**. Students are advised not to write letters to any other officer in the University in this regard. Normally, it takes 4-6 weeks to effect the change. Therefore, the students are advised to make their own arrangements to redirect the mail to the changed address during this period.

6.4 Change of Regional Centre and Study Centre

Counselling facilities are not available for all the programmes at all the study centres. As such, students are advised to make sure that counselling facilities are available, for the subject s/he has chosen, at the new centre opted for. Request for change of Study Centre is acceded to subject to availability of seats for the programme at the new centre asked for only on compelling grounds. Students are required to get a NOC from the Regional center where they are willing to get themselves transferred in view of the practical sessions involved in BCA.

When a student wants transfer from one region to another, s/he has to write to that effect to the Regional Centre from where s/he is seeking a transfer marking copies to the Regional Centre where s/he would like to be transferred to and also to Registrar (SRD), IGNOU, Maidan Garhi, New Delhi-110 068. Further, s/he has to obtain a certificate from the Co-ordinator of the Study Centre from where s/he is seeking transfer from, regarding the number of assignments submitted. The Regional Director from where the student is seeking the transfer will transfer all records including details of fee payment to the Regional Centre where the student is going, under intimation to the Registrar (SRD) and the student. The transfer will be permitted only if seats are available at the new Study Centre.

6.5 Disputes on Admission and other University Matters

In case of any dispute, the place of jurisdiction for filing of a suit/plaint/petition will be only at New Delhi / Delhi.

7. SOME USEFUL ADDRESSES

Telephone numbers of the Divisions/ Schools are provided on the website under the "Contact Us" option.

Students are advised to be in touch with their Study Centres for advance / timely / day-to-day information or visit the website with URL www.ignou.ac.in

For your information, the following officers deal with different educational aspects:

i) Student Registration related issues	Registrar (SRD) Indira Gandhi National Open University , Maidan Garhi New Delhi -110068, 011-29532741 (SRD), 1302/1316 (SRD), Email: sre@ignou.ac.in
ii) Exam Centres, Results, Rechecking of answer scripts, Discrepancies in Result, marks update etc.	Registrar (SED), Indira Gandhi National Open University , Maidan Garhi New Delhi -110068, Phone No: 011-29535828/2482 (SED), Intercom No. 2204/2205(SED), FAX No.011-29534429 068
iii) Admission, Fees, Scholarship, Change of Course/Programme, Change of Address, Study Centre/ Regional Centre, Isssue of Bonafide Certificate, Migration Certificate, Duplicate Identity Card and Non-receipt of Self-learning/ Study Materials, Assignments etc.	Regional Director of concerned Regional Centre
iv) Academic Matters	BCA Programme Coordinator Indira Gandhi National Open University Visveswarayya Bhawan, New Academic Complex, Maidan Garhi New Delhi - 110 068 Phone: 011-29533436 and 011-29572903 Fax no.011-29534542 Email:bca@ignou.ac.in
v) Administrative and counseling matters, missing score of theory and practical assignments, Assessment Sheets	Co-coordinator of your Study Centre/Regional Director of the Regional Centre concerned
vi) Issue of Degree/Diploma/Certificate, Despatch of returned Degrees, verification of Degree	Dy. Registrar (Exam-I) Examination –I Indira Gandhi National Open University , Maidan Garhi New Delhi -110068, Phone No.011-29535438 Intercom No.2224/2213 e-mail sred@ignou.ac.in
For any general assistance	Student Support Centre Indira Gandhi National Open University , Maidan Garhi New Delhi -110068, Phone: 011-29535714, 29572512, 29572514, 29533869 and 29533870 e-mail : ssc@ignou.ac.in

8. MODEL QUESTION PAPERS

For your reference, model question papers for first two semesters are given below. If you want to download the previous year's question papers, download them from the option "For Students" then select "download" and select the "question papers" on the home page of University's website with the URL www.ignou.ac.in.

BCA FIRST SEMESTER MODEL/SAMPLE QUESTION PAPERS

BDP / BCA / BTS
Term-End Examination
June, 2010

FEG-2 : FOUNDATION COURSE IN ENGLISH-2

Time : 2 hours *Maximum Marks : 50*

Note : Answer all the questions.

1. Write a composition in about 350 words on ***any one*** of the following : **20**

   a) Junk food and its effect on youth.
   b) Time-management
   c) Internet and its uses
   d) Good manners

2. Write a paragraph in about 200 words on ***any one*** of the following topics : **10**

   a) How to become a good tourist
   b) Pleasures of a picnic
   c) Maintaining punctuality
   d) Non-violent ways to combat terrorism.

3. Write a report in about 200 words on ***any one*** of the following : **10**

   You are a TV journalist. You were present at the site of a bomb blast in your area. You interviewed an eye-witness of the blast. Write a report of the interview, highlighting the details of the blast, such as, no. of people injured, the amount of damage done, the intensity of the blast, the arrival of the police and rescue operations etc.

   OR

   You are the secretary of the "Health and Well-being Club" of your college. Give a detailed report of the activities e.g.. talks, seminars, blood donation camps, yoga sessions, meditation sessions, walkathons and free eyes-check up camps organized by your club. Your report will be published in the college magazine

4. Summarize the following passage in not more than 100 words and give it a suitable title. **8+2=10**

   Modern life is becoming more and more chaotic and disjointed day by day. Everywhere there is disharmony. In the struggle for survival in this competitive world human beings have forgotten how to live in harmony. That is what Feng Shui teaches us to do-to create harmony in our lives. The Chinese form of Geomancy or Feng Shui, has evolved to be both a science and an art. It's an art since it allows one to explore oneself and one's environment. And it's a science as there is a logic

and reason behind everything. It is not as complicated as many believe it to be. The markets are flooded with Feng Shui objects-beautiful wind chimes, laughing Buddha, dragons, crystal globes and turtles, to heighten positive energy. The purpose of Feng Shui is to organise our homes in such a manner that the Chi energy is accentuated by the precise positioning of our house. It believes that everything and everyone is made of five elements wood, fire, metal, water and earth. They can have positive or negative impact depending on their harmony. Wood is beginning of new life. Fire **is** the yang element and earth is the most inert element. Metal is the most common solution. Water gives life. Feng Shui is based on the principle of Yin and Yang. These two constantly interact to give harmony in our lives. There are a number of instances which have shown that by following the principles of Feng Shui people have benefitted a lot in terms of prosperity and fame.

ECO-1
BACHELOR'S DEGREE PROGRAMME
Term-End Examination
June, 2010
ELECTIVE COURSE : COMMERCE

ECO- 1 : BUSINESS ORGANISATION

Time : 2 hours *Maximum Marks : 50*
(Weightage 70 %)

*Note : Attempt both Part - A and Part - **B.***

PART - A

1. Distinguish between *any two* of the following : 5+5
- a) Business and Trade
- b) Rights issue and Public issue of shares
- c) Advertisement and Publicity
- d) Pledge and Hypothecation

2. Write short notes on *any two* of the following : 5+5
- a) Underwriting
- b) Partnership deed
- c Direct channels of distribution
- d) Warehousing

PART - B

Attempt *any three* of the following questions :

3. "Company form of business organizations emerged essentially because of the limitations and failures of the partnership form of business organisations." Discuss. 2+8

4. What do you understand by capital structure? If you promote a car manufacturing company, what factors do you keep in mind while deciding on the capital structure of your company ? 10

5. "Different channels of distribution are used for different products." Explain with reasons. 10

6. "All business risks are not insurable." In the light of this statement, explain insurable risks and non-insurable risks. 10

7. Why is it considered necessary for the government to directly participate in business and industry ?
   (a) Why do the prices of securities traded on a stock exchange fluctuate widely ? 5
   (b) "Foreign trade is an engine of economic growth in a country". Comment. 5

BACHELOR IN COMPUTER APPLICATIONS

Term-End Examination (Sample Paper)

BCS-11: Computer Basis & PC Software

Time: 3 hours Maximum Marks: 100

Note: Question number 1 is compulsory. Attempt any three questions from the rest.

1. (a) Why is Memory hierarchy needed? Explain the purpose of each level of the memory hierarchy. 5

   (b) Why do you have different topologies in LAN? Explain one topology with the help of an example. 5

   (c) What is system software? Explian functions of OS. 5

   (d) What is the role of ALU in computer? Explain how an instruction is executed in a computer with the help of an example. 5

   (e) What is system software? How is it different to that of application software? Is perverse software a system software or application software? Justify. 5

   (f) What is an IP address? What is URL? Give one example of one each. How an IP address is obtained from a URL? Explain it using an example.7

   (g) Differentiate between Compiler and Interpreter? 4

   (h) Convert the following numbers into binary form:- 4
   (i) 25.75
   (ii) 68

2. (a) Define the term operating system? Explain its functions in a computer system. 6

   (b) Explain the different kinds of channels used in LAN. 6

   (c) Explain the components of a personal computer. 8

3. (a) Why do you need layered architecture of the networks? Explain layers of TCP/IP model. 7

   (b) Why are IC circuits more suited for better computers? What are the current hardware platforms? 7

   (c) Explain any two areas of computer applications in brief. 5

4. (a) How does the Internet work? Explain the role and function of all hardware devices used between client and server machines. 8

   (b) What are latest trends in I/O technologies? What governs the speed of I/O from a hard disk? 6

   (c)What is programming language? Briefly explain any two paradigms of programming 5

5. (a) What is the difference between E-Mail and social networking?
   Explain the different components of an E-Mail. 6

   (b) Describe Software Evolution in detail. 8

(c) Compare & contrast:- 6

(i) UNICODE vs. ASCII
(ii) DVD vs. CD
(iii)Difference Engine vs. Abacus

Bachelor in Computer Applications
Term-End Examination
BCS-012: Basic Mathematics: Sample Paper

Time : 3 hours **Maximum Marks : 100**

Note: Question **number 1 is compulsory**. **Attempt any 3 questions** from question number 2 to 5**.**

(5*8=40)

1. (a) Apply Cramer's rule to solve the following simultaneous equations-

$x + y + z=1;$
$x+2y+z=2;$
$x+y+2z=0.$

(b) Prove by mathematical induction, that $x^n - y^n$ is divisible by x-y for all positive integral values of n.

(c) Show that $ax^2+bx+c=0$ & $x^2+x+1=0$ cannot have a common root unless a=b=c.

(d) How many terms of the series 148+146+144+142+---- must be taken to have their sum amount to 3000? Explain the double answer.

(e) A particle moves along a straight line, so that its distance from a given point in the line at the end of t second, is given by $S= (\frac{1}{8} t^3-1/2\ t^2-6t +5)$ meters. Find-

(i) The velocity at the end of $2^{1/2}$ seconds.
(ii) Its acceleration at the point where its velocity becomes zero.

(f) Find the interval in which the function $f(x) = 2x^3-15x^2+36x+1$ is:-

(i) monotonic increasing &
(ii) monotonic decreasing

(g) Find the equations of the lines through the point (3, 2) which make acute angle of 45^o with the line x-2y=3.

(h) A manufacturer of line of patent medicines is preparing a production plan on medicines A & B. There are sufficient ingredients available to make 20,000 bottles A and 40,000 bottles B but there are only 45,000 bottles into which either of medicine can be put further more it takes three hours to prepare enough material to fill 1,000 bottles A and it takes one hours to prepare enough material to fill 1,000 bottles of B and there are 66 hours available for this operation. The profit is Rs.8/-per bottle for A and Rs.7/- per bottle of B. Formulate this problem as a LPP?

2. (a) What is linear programming problem? How we can formulate a given problem into LPP? (4+4+4+4+4)

(b) Find the inverse of the matrix A

$$\mathbf{A=}\begin{matrix}\mathbf{1} & \mathbf{0} & \mathbf{-1}\\ \mathbf{3} & \mathbf{4} & \mathbf{5}\\ \mathbf{0} & \mathbf{-6} & \mathbf{-7}\end{matrix}$$

(c) The sum of three numbers in A.P is 24 & their product is 440. Find the numbers.

(d) If α & β be the roots of $ax^2 + bx + c=0$, find the equation whose roots are α^2 & β^2.

(e) If (x1, y1), (x2, y2) & (x3, y3) be the three consecutive vertices of a parallelogram, find the fourth vertex.

3. (a) Find the angles between the lines $x+3y-8=0$ & $2x-3y+6=0$. 3

(b) Find the maximum and minimum values of $x^3 -2x^2 +x+6$. 4

(c) Use mathematical induction to prove: - 4

If n is any positive integer then $n(n^2-1)$ is divisible by 24.

(d) Show that the matrices- 3

A= 2 X 2 X 1
1 X 3 X 1
1 X 2 X 2
&
B=2 X 1 X -1
0 X -2 X -1
-3 X- 2 X 3
Have the same eigen value but are not similar.

(e) Find the square root of 9+40i. 3

(f) Explain the De Moivre's Theorem with suitable example. 3

4. (a) Verify a*(b*c) = (a.c) b-(a.b) c, given a=i+2j+3k, b=2i-j+k and c=3i+2j-5k. 3

(b) (i) $\int dx/\sqrt{(1-4x^2)}$ (2*2=4)

(ii) $\int \sec^2(3x+5)\,dx$

(c) Find the limits of following-

(2*3=6)

(i) $\lim_{x\to\infty} (4x^2-3x+5)/(2x^2+5x+10)$

(ii) $\lim_{x\to 0} \{\sqrt{(1+x^2)}-\sqrt{(1-x^2)}\}/x$

(iii) $\lim_{x\to 2} \{\sqrt{(1+x^2)}-\sqrt{(1-x^2)}\}/x^2$

(d). Simplify $(1-i)^3$ 3

(e) If $x=3at/(1+t^3)$ & $y=3at^2/(1+t^3)$, t being a parameter, find dy/dx when t=1/2. 4

5. (a) (4*5=20)

Find the value of x-

15-2x	11	10
11-3x	17	16
7-x	14	13

(b) The sum of three consecutive numbers in H.P is 37 & he sum of their reciprocals is 1/4, find the numbers.

(c) If α, β & γ be the roots of the cubic equation $x^3+3qx+r=0$, form the equation whose roots shall be $(\beta-\gamma)^2$, $(\gamma-\alpha)^2$, $(\alpha-\beta)^2$.

(d) If f(x) is continuous at x=1, when
$f(x)=x-1$, $0\le x\le 1$

$1-x^2$, $x>1$?

(e) Find the area of the circle $x^2+y^2=a^2$ by integration.

Bachelor in Computer Applications
Term-End Examination
BCSL-013: Computer Basics and PC Software Lab: Sample Paper

Time : 2 hours **Maximum Marks : 50**

To Be Added Later

FORMS AND ENCLOSURES

Note: You may use the photocopies of the forms provided in programme guide.

FORM NO. 1

INDIRA GANDHI NATIONAL OPEN UNIVERSITY
ASSIGNMENTS REMITTANCE -CUM-ACKNOWLEDGEMENT FORM

Enrol. No._____
Programme Title: _____

Name : _____

Course Code: _____Medium: _____

S.No.	Assignment No.

For Office Use Only

S .No. _____
Date of Receipt: ____
Name of Evaluator: _

Signature of the Student
Date : _____

Date of despatch to the Evaluator:
_____

Date of receipt from the Evaluator:
_____

ASSIGNMENTS REMITTANCE -CUM-ACKNOWLEDGEMENT CARD

Enrol. No._____
Name : _____
Course Code: _____

Programme Title: _____
Medium : _____

S.No.	Assignment No.

For Office Use Only

S.No. _____

Signature of the recevier _____

Date : _____

Seal

Signature of the Student

Name : _____
Address of the Student : _____
Date : _____
(Please write your complete address and affix adequate postal stamp on reverse)

Affix Stamp Here

Please read the instructions overleaf before filling up this form: **FORM NO. 2**

Indira Gandhi National Open University
New Delhi
REQUISITION FOR FRESH SET OF ASSIGNMENTS

Programme of Study

Enrolment Number | | | | | | | | | | Study Centre Code | | | | |

Write in BLOCK CAPITAL LETTERS only.

Name: Shri/Smt./Kum

Please indicate course code, assignment code and course title for which you need the assignments in the following columns. The assignments of the course which you have already passed should not be mentioned.

Sl. No.	*Course Code*	*Assignment Code*	*Course Title*	*Medium*
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

REASONS FOR REQUEST FOR FRESH SET OF ASSIGNMENTS: (Tick (√) whichever is applicable)

1. Assignments not received at all earlier.
2. Assignments were received after the due dates prescribed for their submission.
3. Assignments submitted but could not secure minimum qualifying score.
4. Assignments submitted earlier but misplaced at Study Centre/Post/HQ.
5. Assignments responses submitted after due dates were rejected by the Study Centre.
6. Failed to secure over-all qualifying grade in course(s) mentioned above and wish to improve over-all qualifying grade only by attempting one assignment.

Complete Address ..... **Signature .....**

..... **Date .....**

.....

Pin. Code : .....

For Office Use Only:
Date of Despatch of Assignments to the student: .....

INSTRUCTIONS FOR DOING ASSIGNMENTS

1. Read instructions for submission of assignments given in your Programme guide carefully.

2. Assignments should be demanded only, if your registration for that course (Subject) is valid.

3. Please ensure that you have mentioned your correct Enrolment No. (it consists of 9 digits), Name, Course Code/ Title, Name of semester/year, wherever applicable and Study Centre Code on your assignment responses before submitting it to concerned authorities.

4. Submission of assignments within due dates is prerequisite for appearing in the term-end examination. You are, therefore, advised to submit your ASSIGNMENTS at your Study Centre within the prescribed dates. Assignment received after due dates will be summarily rejected.

5. You can appear in term-end examination or submit only minimum required number of assignments if you fail to secure over-all qualifying grade in the course (subject).

6. Assignments should not be demanded to improve your score if you have secured minimum qualifying score in a course (subject).

7. Please do not submit your assignment responses twice either at the same Study Centre or at different Study Centres for evaluation.

Please mail this form to:

The Registrar
MPPD
Indira Gandhi National Open University
Maidan Garhi
NEW DELHI- 110 068

Please retain a photocopy of any matter that you submit to the University.

Form No. 3

Indira Gandhi National Open University
Maidan Garhi, New Delhi-110 068

Application Form for obtaining Duplicate Grade Card/Mark-sheet

Name of the Candidate .....

Enrolment No. | | | | | | | | | |

Address .....

.....

.....

Pin Code : | | | | | | |

Programme .....

Month and Year of the Exam .....

Centre from where
appeared at the last
examination: .....

Bank Draft/IPO No. ..... dated ..... for Rs. 100/- in favour of IGNOU, New Delhi

.....

Date: ..... Signature

Note: Fee for duplicate, grade card is Rs. 100/-. The duplicate grade card/mark list will be sent by Registered Post.

The filled in form with the requisite fee is to be sent to:

The Registrar (S R & E)
Indira Gandhi National Open University
Block 12, Maidan Garhi
New Delhi -110 068.

Form No.4

(**For Change of Address, send it duly filled-in to the concerned Regional Director, who will forward it to the Registrar (SRD), Maidan Garhi, New Delhi after verification)**

Application for Change of Address

Date: _____

To

The Registrar, SRD
IGNOU
Maidan Garhi
New Delhi-110 068.

THROUGH THE REGIONAL DIRECTOR CONCERNED

Enrolment No._____

Programme_____

Name (in caps)_____

1. DETAILS FOR CHANGE/CORRECTION OF MAILING ADDRESS

New Address

_____

_____

_____

_____

City_____Pin_____

State_____

Old Address

_____

_____

_____

_____

City_____Pin_____

State_____

_____
Signature of the Student

SRD is requested to provide it.

Form No.6

INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI NEW DELHI – 110 068

APPLICATION FORM FOR RE-EVALUATION OF ANSWER SCRIPT

Name: …….

Programme ……

Enrolment No.

Address:

……..

……..

……

……

Pincode

Month and Year of the Exam:…….

Name of Exam Centre:…….

Centre Code:…….

Courses, in which Re-evaluation is sought	**COURSE CODE**	**TITLE OF THE COURSE**
	……	……...
	……	……...
	……	……...
	……	……...

Total amount paid Rs:……
(Rs.300/- per course/paper)

Bank Draft No……**(Issuing Bank)**……

Date:…… **Signature of the student**

NOTE:

The request for re-evaluation by the students must be made before 31st March for December TEE and 30th September for June TEE or within one month of declaration of results whichever is later. The date of declaration of results will be calculated from the date on which the results are placed on the IGNOU website.

After re-evaluation, the better of the two scores of original marks/grade and re-evaluated marks will be considered.

The revised marks after the re-evaluation shall be incorporated in the student record and the revised Grade card/Marks sheet shall be sent to the students within one month from the receipt of the application.

Re-evaluation is not permissible for the Projects, Practicals, Assignments, Seminar etc.

The filled in form with the requisite fee is to be sent to:
Dy. Registrar (Exam-III)
(S.R. & E. Division)
Indira Gandhi National Open University
Maidan Garhi, New Delhi – 110 068

SRD is requested to provide it.

Form No.8

INDIRA GANDHI NATIONAL OPEN UNIVERSITY

APPLICATION FORM FOR IMPROVEMENT IN DIVISION/CLASS

(Rules & regulations are mentioned on next page of this form. Please go through them carefully before filling up the form).

Prescribed dates for submission of form:- **1st to 30th April for June Term-end Exam.**
1st to 31st October for December Term-end Exam.

1. Name :……

2. Programme: ☐ **Enrolment No. :** ☐☐☐☐☐☐☐☐☐

3. Address: ……

……...…….

……. **Pin Code** ☐☐☐☐☐☐

4. Term-end examination, in which programme completed June/December ……

Total marks/Overall point grade obtained **Percentage obtained**

…….. …….

(Please enclose photocopy of the statement of marks/grades card)

5. Course(s), in which Improvement is sought:

	COURSE CODE		COURSE CODE
1.	…….	4.	……
2.	…….	5.	……
3.	…….		

6. Fee details:-
(The fee for this purpose is to be paid through demand draft drawn in favour of IGNOU & payable at New Delhi).

No. of Course(s) ……. …… X Rs. 300/- =Total Amount ……....

Demand Draft No. …… Date …… ……..

Issuing Bank …….

7. Term-end examination, in which you wish to appear:- June /December……....

8. Examination centre details, where you wish to appear in term-end examination:-

Exam. Centre Code:…… City/Town: …….

……

UNDERTAKING

I hereby undertake that I shall abide by the rules & regulations prescribed by the University for improvement in Division/Class.

Date: …… **Signature: ……**
Place: …… **Name: ……..**

P.T.O.

RULES & REGULATION FOR IMPROVEMENT IN DIVISION/ CLASS

1. **The improvement of marks/grades is applicable only for the Bachelor's/Master's Degree Programmes.**

2. **The students, who fall short of 2% marks for securing 1st Division or 2nd Division only, are eligible for applying for improvement.**

3. **Only one opportunity will be given to improve the marks/grade.**

4. **The improvement is permissible only in theory papers. No improvement is permissible in Practicals / Lab courses, Projects, Workshops and Assignments etc.**

5. **Under the Provision of improvement, a maximum of 25% of the maximum credits required for successful completion of a programme shall be permitted.**

6. **Students wishing to improve the marks will have to apply within six months from the date of issue of final statement of marks/grade card to them, subject to the condition that their registration for the programme/course being applied for improvement, is valid till the next term-end examination in which they wish to appear for improvement.**

7. **No student will be permitted to improve if maximum duration to complete the programme, including the re-admission period, has expired.**

8. **After appearing in the examination for improvement, better of the two examinations i.e. marks/grade already awarded and the marks/grade secured in the improvement examination will be considered. In such cases, the improved marks/grade can be incorporated only on surrender of the statement of marks/Grade Card, Provisional Certificate and Degree Certificate already issued to the student.**

9. **In case of improvement, the month and year of completion of the programme will be changed to the Term-end examination, in which students appeared for improvement.**

10. **Students will be permitted for improvement of marks/grades provided the examination for the particular course, in which they wish to improve is being conducted by the University at that time.**

11. **Students wishing to improve their performance should submit the application in the prescribed format alongwith fee @ Rs. 300/- per course by means of Demand Draft drawn in favour of IGNOU payable at New Delhi and send within the prescribed dates to the following address:-**

    Registrar,
    Student Registration & Evaluation Division,
    Indira Gandhi National Open University,
    Maidan Garhi,
    New Delhi-110068

12. **On the top of the envelope containing the prescribed application form,**
    Please mention "APPLICATION FORM FOR IMPROVEMENT IN DIVISION/CLASS"