

**PROGRAMME GUIDE
FOR
BACHELOR OF COMPUTER APPLICATIONS**

(Mode: Open & Distance Learning - ODL)

(Programme Code: BCA_NEW)

Version 2.0



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

<http://www.ignou.ac.in> MAIDAN GARHI, NEW DELHI - 110 068

<http://www.ignou.ac.in>

ProgrammeGuide :Version 2.0

July, 2026. This is the Programme Guide for BCA_NEW Programme offered by IGNOU from July, 2024 admission cycle.

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Further information on the Indira Gandhi National Open University courses can be obtained from the University's office at Maidan Garhi, New Delhi-110 068 or from its Regional Centres spread across the length and breadth of the country.

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MESSAGE FROM PROGRAMME COORDINATOR

Dear Student,

I welcome you to the Bachelor of Computer Applications (BCA_NEW) Programme. IGNOU's BCA_NEW Programme is structured as per latest developments in the field of Computer Science Applications and also keeping in view the need and requirements of the Information Technology Industry. BCA_NEW programme from July, 2024 session carries 120 credits. During your study, you will receive support from IGNOU through the network of our Regional / Student Support Centres(LSCs) and web. You will be attached to a Student Support Centre where most of the academic activities including academic and practical counseling will take place. Attend counseling sessions at your Student Support Centre regularly as per schedules. Attending the counseling sessions with preparation will provide you an opportunity to clear your doubts in the respective course. You will receive printed course material in accordance with IGNOU's dispatch schedules. There may be delays in your receipt of printed course material due to various reasons. It may be noted that the course material is available at <http://www.egyankosh.ac.in> and the same may be downloaded for carrying your studies without interruption until you receive the printed course material. You need to have a **minimum of 70% attendance** for practical counseling sessions, to be eligible to appear for Term End Practical Examinations. In case you fall short of minimum attendance for practical counseling sessions, then, you may need to pay the prescribed fee to attend the practical counseling sessions again and appear for the term end practical examinations in future. You need to submit requisite assignments before the due dates to become eligible to appear for Term End Theory and Practical Examinations.

Please note that BCA_NEW programme guide and assignments are not sent in printed form. They will be available only on IGNOU Website and can be downloaded. Normally, you need to submit your assignments at the respective LSC. There is need for you to be in constant touch with IGNOU Website as well as regularly check your email for communications from the Regional Center / LSC and other departments of IGNOU so that you can follow them. It is essential to re-register for each semester from second semester onwards after you get admission to the first semester. **Also, try your best to solve the previous exams question papers of the concerned courses during the semester. It will enable you understand the concepts in depth thus increasing the probability of your success.** Self Learning is the key for success. The counseling sessions are different from lectures. You are suggested to prepare in advance and get your doubts clarified by the concerned Academic Counselor at the LSC.

It is to be noted that the payments that are mentioned in various proformas/formats/forms are as on date and is **subject to revision from time to time**. You are advised to check these proformas/formats/forms from IGNOU website/LSC/RC for any revision/ modification. Some useful forms and formats (or the link to useful forms and formats) are also given at the end of this booklet. The Programme Guide, forms and formats are also available on the IGNOU website. Please confirm the fees with the RC / LSC / website before you pay. Programme Guide is a very important document for you, as a distance student you may have several queries, many of them would be answered by this booklet. Preserve this booklet until you successfully complete the BCA_NEW Programme. Don't forget to re-register for the semesters as per schedule as you may not be able to pursue your studies without payment of the fee before due dates. Some useful addresses are given in this Programme Guide. In case of any difficulty, communicate to the concerned, on the listed address for fast action. Please note that the information given in Programme Guide may vary from time to time. Hence, please ascertain from IGNOU website or concerned departments by email before following.

IGNOU reserves the right to change any rule or regulation pertaining to BCA_NEW Programme that are specified or not specified in the Programme Guide, at any time. You are advised to visit **IGNOU website-<http://www.ignou.ac.in>, and your Regional Center Website for latest information and circulars, if any. Also contact/visit your Student Support Center regularly for latest information, if any.** I wish you success in pursuing BCA_NEW Programme. The fee mentioned in the Programme Guide may change. **Hence, before payment, please find the correct fee from the concerned department or IGNOU website.**

Wishing you all the best,

BCA_NEW Programme
Coordinator Email ID :
bca@ignou.ac.in

1. BASIC INFORMATION

1.1 BCA_NEW 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_NEW) at IGNOU, there is a further educational opportunity to go for an MCA at IGNOU or Master's Programme at any other University/Institute based on the eligibility conditions prevailing at the time of admission. Also after completing BCA_NEW Programme, a student should be able to get a entry-level jobs in the field of Information Technology or ITES.

1.2 Duration of the Programme

- **Minimum:** 3 Years
- **Maximum:** 6 Years

Re-registration:

You are required to re-register for the subsequent semester by paying the fee, for continuation of your study. You can re-register through online re-registration portal of IGNOU before a specified last date. Last date of Re-Registration is announced on the registration portal of IGNOU. In general, the re-registration is to be done about 2 months prior to the start of the next semester.

1.3 Programme Fee

Rs.8300/- per semester Plus Registration Fee & Development Fee as applicable. The fees may change as and when University decides. The student may get latest update on the fees from the concerned IGNOU Regional Centre or from the Student Registration Division (SRD) or from Student Service Centre (SSC).

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.**

Credit Transfer policy:

- **General Credit Transfer Policy(Internal/External)-(Link):**
[Modified Credit Transfer Policy \(Internal and External Credit Transfer\)](#)
- **BCA-Internal Credit Transfer Policy (Link):**
[InternalCreditTransfer_BCAREvised_BCA_NEW-BCA_NEW.pdf](#)

- **Credit Transfer from SWAYAM Courses (Link):**
[Notification-regarding_credit_transfer.pdf](#)

Regarding the Credit Transfer of SWAYAM Courses to the respective courses from the existing BCA, BCA_NEW programmes of SOCIS as listed below:

Sr.No.	Course Code	Title of the Course	Programme Code
1	BCS-012	Basic Mathematics	BCA, BCA_NEW
2	BCS-042	Introduction to Algorithm Design	BCA, BCA_NEW

since these courses are already part of the BCA, BCA_NEW programmes offered by SOCIS:

The credit transfer of the above mentioned MOOC courses completed through SWAYAM platform is allowed as per the Credit Transfer Policy of the University.

1.6 BCA_NEW 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 duration and other formalities prescribed for the programme. Student may ensure that s/he paid the requisite fee as well as fulfils other requirements such as prescribed minimum attendance etc. before appearing in the term end examinations. The result may be withheld or may be cancelled in case it is found that the student's registration to the course is invalid or did not register. The following is the **BCA_NEW Programme Structure**:

AWARD		Course Code	Course Title	Credits	School	
B A C H E L O R A O F C O M P U T E R A P P L I C A T I O N S	D I P L O M A I N T E R C O M P U T E R A P P L I C A T I O N S	SEMESTER I				
		BEVAE-181	Environmental Studies	4	SOS	
		BEGLA-136	English at Work Place	6	SOH	
		BCS-111	Computer Basics and PC Software	4	SOCIS	
		BCSL-013	Computer Basics and PC Software Lab	2	SOCIS	
		BCS-012	Basic Mathematics	4	SOCIS	
			Total Credits:	20		
		SEMESTER II				
		FEG-02	Foundation Course in English-2	4	SOH	
		MCS-202	Computer Organisation	4	SOCIS	
		MCS-203	Operating Systems	4	SOCIS	
		MCSL -204	WINDOWS and LINUX Lab	2	SOCIS	
		MCS-201	Programming in C and Python	4	SOCIS	
		MCSL– 205	C and Python Lab	2	SOCIS	
			Total Credits:	20		
		SEMESTER III				
		MCS-208	Data Structures and Algorithms	4	SOCIS	
		MCSL -209	Data Structures and Algorithms Lab	2	SOCIS	
		MCS-207	Database Management Systems	4	SOCIS	
		BCS- 131	Programming in C++	4	SOCIS	
		BCSL-135	DBMS and C++ Lab	2	SOCIS	
		BCS -040	Statistical Techniques	4	SOCIS	
			Total Credits:	20		
		SEMESTER IV				
		MCS-206	Object Oriented Programming using Java	4	SOCIS	
		BCSL-146	Object Oriented Programming using Java Lab	2	SOCIS	
		BCS -053	Web Programming	2	SOCIS	
		BCSL-147	Web Programming Lab	2	SOCIS	
		BCS -041	Fundamentals of Computer Networks	4	SOCIS	
		BCOC-131	Financial Accounting	6	SOMS	
			Total Credits:	20		
		SEMESTER V				
BCS- 151	Introduction to Software Engineering	4	SOCIS			
BCS – 042	Introduction to Algorithm Design	2	SOCIS			
BCSL-159	Introduction to Algorithm Design Lab	2	SOCIS			
BCOS - 184	E-Commerce	4	SOMS			
MSEI-023	Cyber Security	4*	SOVET			
BECS-184	Data Analysis	4	SOSS			
	Total Credits:	20				
SEMESTER VI						
BCOS -185	Entrepreneurship	4	SOMS			
MSEI-027	Digital Forensics	4*	SOVET			
BCSP-165	Project	12	SOCIS			
	Total Credits:	20				

No. of Theory Courses: 23; No. of Practical Courses: 08; Project: 01; Total Credits: 120

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Multiple Exit Scheme:

This is with reference to the IGNOU notification no. IG/SRD/R-iV/2022/974 ndated 24-August-2022.

- 1) Completion of First and Second semester awards "Undergraduate Certificate in Computer Applications".
- 2) Completion of First, Second, Third and Fourth semester awards "Undergraduate Diploma in Computer Applications"

1.7 Recognition

IGNOU is a Central University established by an Act of Indian 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 Circulars F-1/8/92(CPP) dated Feb.1992 and F1-52/ 2000 (CPP-II) dated 5 May, 2004 & AIU Circular No. EV/B (449)/94/177115 dated January 14, 1994.

In recognition of the pre-eminence of IGNOU and its quality of education and degrees offered, IGNOU has been exempted from seeking approval from UGC for offering programmes in ODL and Online MODE (as per UGC notification F.No.1-19/2020(DEB-I) dated March 25, 2021.

You may download all the recognition related information from the following web link.

<https://www.ignou.ac.in/pages/183#Notifications>

1.8 Student Support Services

In order to provide individualized support to its students, the University has created a number of LSCs throughout the country for this Programme. These are administratively coordinated by the Regional Centres. The LSCs are the contact points for the students on all major aspects of the Programme. These include counselling sessions for theory, practical, etc.

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 LSC 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 LSC 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.*** You are also advised to be in touch with IGNOU website so that you are updated to the latest developments in BCA_NEW. Please ensure that you don't follow any oral advice without authenticating from IGNOU Website or IGNOU email IDs.

Link :<https://www.ignou.ac.in/pages/196>

1.9 iGRAM

With the objective of putting in place a system for quick resolution of students problems IGNOU has developed iGRAM. **For quick response and redressal you may send your query/grievance on iGRAM at <http://igram.ignou.ac.in/>.**

1.10 Contact information of BCA_NEW Programme Coordinator

Students may contact the BCA_NEW Programme Coordinator by sending a communication through post to The BCA_NEW Programme Coordinator, SOCIS, Vishveswaraiah Bhavan, C-Block, IGNOU Academic Complex, IGNOU, Maidan Garhi, New Delhi – 110068, or can send an Email to bca@ignou.ac.in

Postal Address is:

The BCA_NEW Programme Coordinator,
SOCIS, Vishveswaraiah Bhavan, C-Block,
IGNOU Academic Complex, IGNOU,
Maidan Garhi, New Delhi – 110068,

2. INSTRUCTIONAL SYSTEM

The methodology of instruction in this university is different from that of the conventional universities. The Open University system is student-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 having face-to-face communication. The University follows a multi-channel approach for instruction. It comprises a suitable mix of:

- ☞ self-instructional material
- ☞ face-to-face counselling at LSCs by academic counsellors
- ☞ web based academic support: e-content available on e-Gyankosh portal
- ☞ assignments
- ☞ practicals
- ☞ Gyan Vani
- ☞ Gyan Darshan
- ☞ SWAYAM Prabha

2.1 Self Learning Materials (SLMs)

SLMs are the primary form of instructional materials. 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 SLMs alone may not be sufficient to write assignments and prepare for the term-end Examinations. Some reference books are available at your LSC. There may be delays in the receipt of printed study materials by the students owing to different reasons. However, students are advised to download the course material that is available on IGNOU website and start studying. They are also advised that they attend to the video lectures uploaded to

YouTube Link: [\(28343\) ignousocis - YouTube](#)

2.2 E-Gyankosh

You may download softcopy of your study material of BCA_NEW from eGyankosh

- *Self-Learning Material*: <https://www.egyankosh.ac.in/handle/123456789/401>
- *YouTube-Video Archives*: <http://www.egyankosh.ac.in/handle/123456789/35748>

2.3 IGNOU eContent App

The self-instructional course material of various programmes of IGNOU are made available through IGNOU eContent APP:

<https://play.google.com/store/apps/details?id=ac.in.ignou.Viewer&hl=en>

IGNOU eContent App for Android can be downloaded and installed from

<https://play.google.com/store/apps/details?id=ac.in.ignou.Viewer>

2.4 Lectures on Gyan Darshan and Interactive Radio Counselling

The live lectures based on BCA_NEW courses of SOCIS are telecasted on GD (Gyan Darshan) channel. The live telecast can be seen on <http://www.ignouonline.ac.in/>. You can listen radio counseling programs on <http://www.ignouonline.ac.in/>. Also schedule of GD (Gyan Darshan)

lectures and Interactive Radio Counselling Program (IRC) can be seen on <http://www.ignouonline.ac.in/>



Figure: IGNOU Online Portal Web Page

Details of Availability on various platforms of Gyan Darshan Channel and Gyan Vani
Gyan Darshan Channel

Sl. No.	DTH Platform	TV Channel No.
1.	Airtel	442
2.	TATA Sky	755
3.	Sun Direct	596
4.	Den	526
5.	In Digital	464 (Delhi)
6.	Hathway	473
7.	Dish TV	991
8.	TACTV	576 & 577

Gyan Darshan Web Link: <https://onlineservices.ignou.ac.in/empclive/>

Gyandarshan TV Channel available on C-band

Telephone number of EMPC Video Studio-2 for interaction; during live session: 011-29532844, 011-29532845, Toll Free: 1800112346, Fax: 011-29536134. Please check the latest Channel Numbers , Telephone Numbers , Toll Free Numbers, Fax etc.

Gyan Vani Channel

Sl. No.	DTH Platform	TV Channel No.
1.	DD Free Dish	44

SWAYAM PRABHA-DTH Channel-13 (Professional and Vocational Education): It is funded by MoE, Govt. of India and Coordinated by IGNOU, New Delhi. This is an exclusive channel covering IGNOUs' Professional and Vocational Education Programmes. This channel broadcasts visually high-quality and graphically enriched video content of IGNOUs' Certificate/Diploma/PG Diploma/PG Certificate/Undergraduate/Postgraduate courses pertaining to Computer Science/Application, Management Studies, Vocational Education, Engineering and Technology, Law Extension and Development Studies, Social Work, Journalism and New Media Studies, Performing Arts and Health Sciences. These video lectures are delivered by Faculty of IGNOU and also from renowned institutional in India, covering basics to advanced courses.

Gradually, IGNOU is recording and pooling the videos on Channel-13
SWAYAM PRABHA homepage: <https://www.swayamprabha.gov.in/> and
[Swayam Prabha | Educational DTH channels | India](#)

2.5 Counseling Sessions

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

2.5.1 Theory Sessions

In Open and Distance Learning (ODL) system, face-to-face contact between the students 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 Student Support Centres to provide Counseling and guidance to you in the courses that you have chosen for study. Normally, these sessions will be held at the LSCs.

You should note that the Counseling 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 BCA_NEW programme. In these sessions, you must try to resolve your subject-based difficulties and any other related issues.

Before attending the Counseling 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.

2.5.2 Practical Sessions and Compulsory Attendance

The practical sessions will be held in the computer centres / labs of the LSCs. 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** are **required to re-appear in the practical classes in the next session in the next session by remitting 50% of the pro-rate fee.** For fee details and the application form, please contact your Regional Centre. In case, the student appears for the term end practical examination in a course without fulfilling the minimum attendance requirements, then the result shall be withheld and University reserves the right to cancel the result.
- iv) Student attendance will be recorded course-wise at the LSC.
- v) Strictly follow the guidelines given in the Lab manuals for the respective lab courses.
- vi) **Computer to Student ratio will be 1:2.**

2.5.3 Number of Counseling sessions

AWARD			Course Code	Course Title	Credits	School	Counselling Sessions(Nos)	
B C A B A C H E L O R S O F T W A R E A P P L I C A T I O N S B C A	D I P L O M A T I C A N C O M P U T E R A P P L I C A T I O N S	C E R T I F I C A T E	SEMESTER I					
			BEVAE-181	Environmental Studies	4	SOS	05	
			BEGLA-136	English at Work Place	6	SOH	09	
			BCS-111	Computer Basics and PC Software	4	SOCIS	09	
			BCSL-013	Computer Basics and PC Software Lab	2	SOCIS	20	
			BCS-012	Basic Mathematics	4	SOCIS	12	
				Total Credits:	20			
			SEMESTER II					
			FEG-02	Foundation Course in English-2	4	SOH	05	
			MCS-202	Computer Organisation	4	SOCIS	06	
			MCS-203	Operating Systems	4	SOCIS	06	
			MCSL -204	WINDOWS and LINUX Lab	2	SOCIS	20	
			MCS-201	Programming in C and Python	4	SOCIS	06	
			MCSL– 205	C and Python Lab	2	SOCIS	20	
				Total Credits:	20			
			SEMESTER III					
			MCS-208	Data Structures and Algorithms	4	SOCIS	06	
			MCSL -209	Data Structures and Algorithms Lab	2	SOCIS	20	
			MCS-207	Database Management Systems	4	SOCIS	06	
			BCS- 131	Programming in C++	4	SOCIS	09	
			BCSL-135	DBMS and C++ Lab	2	SOCIS	20	
			BCS -040	Statistical Techniques	4	SOCIS	05	
				Total Credits:	20			
			SEMESTER IV					
			MCS-206	Object Oriented Programming using Java	4	SOCIS	06	
			BCSL-146	Object Oriented Programming using Java Lab	2	SOCIS	20	
			BCS -053	Web Programming	2	SOCIS	10	
			BCSL-147	Web Programming Lab	2	SOCIS	20	
			BCS -041	Fundamentals of Computer Networks	4	SOCIS	12	
			BCOC-131	Financial Accounting	6	SOMS	10	
				Total Credits:	20			
SEMESTER V								
BCS- 151	Introduction to Software Engineering	4	SOCIS	09				
BCS – 042	Introduction to Algorithm Design	2	SOCIS	06				
BCSL-159	Introduction to Algorithm Design Lab	2	SOCIS	20				
BCOS - 184	E-Commerce	4	SOMS	06				
MSEI-023	Cyber Security	4*	SOVET	5 Theory + 10 Practical				
BECS-184	Data Analysis	4	SOSS	12				
	Total Credits:	20						
SEMESTER VI								
BCOS -185	Entrepreneurship	4	SOMS	06				
MSEI-027	Digital Forensics	4*	SOVET	5 Theory + 10 Practical				
BCSP-165	Project	12	SOCIS	12				
	Total Credits:	20						

*: There are both theory and practical components in MSEI-023 and MSEI-027

- Note: (1) Duration of each theory academic counselling session: 2 hours**
(2) Duration of each practical academic counselling session: 3 hours;

Multiple Exit Scheme:

This is with reference to the IGNOU notification no. IG/SRD/R-iV/2022/974 ndated 24-August-2022.

- 1) Completion of First and Second semester awards "Undergraduate Certificate in Computer Applications".
- 2) Completion of First, Second, Third and Fourth semester awards "Undergraduate Diploma in Computer Applications"

2.5.4 Semester wise Counseling Sessions:

Semester	No. of Sessions	
	Theory	Practical
I	35	20
II	23	24
III	26	40
IV	38	40
V	38	30
VI	11	22
TOTAL	171	176

Note: For BEVAE-181, BEGLA-136, FEG-02, BCOC-13, BCOS-184, MSEI-023, BECS-184, BCOS-185 AND MSEI-027 courses, number of counseling sessions will be as per existing decisions / rules of the respective schools.

Note: 70% attendance is compulsory in Practical Lab Counseling 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 is subject to continuous updates. Thus, various pages shown here may change in future. IGNOU itself is continuously changing to bring about improvement in quality of its services. You must visit IGNOU website for all the latest information, filling up or downloading various form, downloading of assignments, results etc.

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

From this **Home page** Select **about IGNOU** which will display an Option List select **School of Studies**. It will show you a page of all the schools of studies of IGNOU, Select **School of Computer and Information Sciences (SOCIS)** to display page of SOCIS (Figure 2).

School of Computer and Information Sciences (SOCIS) offers the Computer Programmes: PhD, MCA_New, MCAOL, BCA_NEW, BCA_NEWOL, CIT, CITOL as PGDCA_New and CMAD as shown in Figure 2.

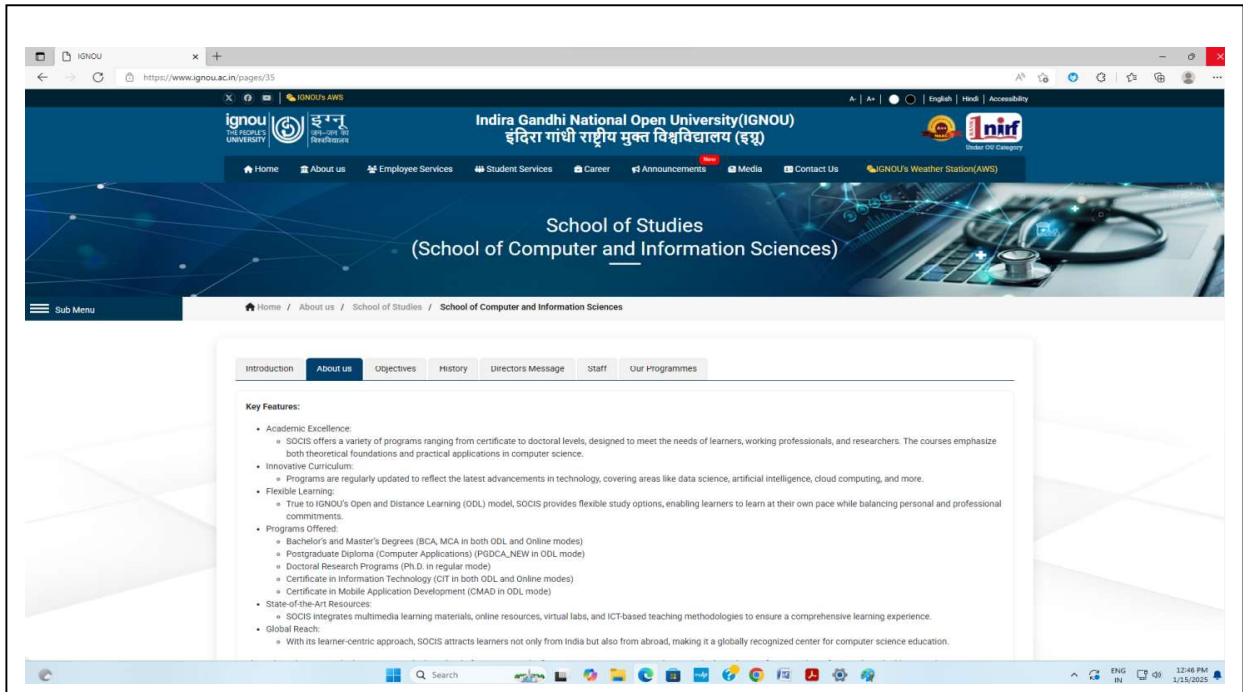


Figure 2: SOCIS Page on IGNOU Website

One of the most important link for students is Student Services which can be reached from Home page by selecting Student Services option. Figure 3 displays the options of the Student Services.



Figure 3: Student Services Page

3.2 Navigation from IGNOU's Home Page

To navigate for the details of BCA_NEW programme, follow the sequence of the links given below:

1. <https://www.ignou.ac.in/>
2. <https://www.ignou.ac.in/pages/2>
3. <https://www.ignou.ac.in/pages/25>
4. <https://www.ignou.ac.in/pages/35>
5. <https://www.ignou.ac.in/pages/35#programmes>
6. https://www.ignou.ac.in/schools/programme/BCA_NEW

4. BCA_NEW SYLLABUS

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

4.1 Detailed Syllabus of BCA_NEW First Semester

1. BEVAE - 181 Environment Studies 4 Credits

Block 1: An Introduction to Environment and Environmental Issues

Unit 1: Our Environment

Unit 2: Ecosystems

Unit 3: Major Ecosystems

Block 2: Natural Resources

Unit 4: Land and Water

Unit 5: Forest Resources

Unit 6: Biodiversity: Value and Services

Unit 7: Energy Resources

Block 3: Environmental Issues and Concerns

Unit 8: Biodiversity: Threats and Conservation

Unit 9: Environmental Pollution and Hazard

Unit 10: Waste Management

Unit 11: Global Environmental Issues

Block 4: Protecting our Environment: Policies and Practices

Unit 12: Environmental Legislation

Unit 13: Human Communities and Environment

Unit 14: Environmental Ethics

2. BEGLA-136 English at the Workplace 6 Credits

Block 1: Exploring the Job Market

- Unit-1** Profiling Oneself for the Job
- Unit-2** Searching for a Job
- Unit-3** Responding to Job Advertisements
- Unit-4** Preparing for the Job

Block 2: Preparing for Job Interviews

- Unit-5** Using Body Language Effectively
- Unit-6** Portfolio Making
- Unit-7** Writing Your Curriculum Vitae (CV)
- Unit-8** Preparing to Face an Interview

Block3: Skills for the Workplace-I

- Unit-9** Etiquette, Cultural Awareness and Gender Perceptions
- Unit-10** Understanding Customers
- Unit-11** Essentials of Customer Service
- Unit-12** Work Ethics

Block 4: Skills for the Workplace-II

- Unit-13** Participating in Discussions
- Unit-14** Marking Presentations
- Unit-15** Writing Business Letters
- Unit-16** Writing Business Emails

3. BCS-111: Computer Basics and PC Software

3 Credits

Objectives:

This is the first course in Computer Science for the BCAOL 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 Credits****Objectives:**

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 I**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 II**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. 2nd order derivatives.

Unit 2: Simple Application of Differential Calculus

Rate of change; monotonicity-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: Vector-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 constraints, 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 3: 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,

Session.3 : 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 GoogleDoc (3 Sessions).

4.2 Detailed Syllabus of BCA_NEW Second 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. MCS-202 Computer Organisation

4 Credits

Objective

This course explains the basic component of computer systems. This course includes details on data representation, interconnection structures, memory system, input-output system, and the Central Processing Unit. It also provides a detailed view of digital logic circuits, microprocessors and assembly language Programming and some of the important peripheral devices. Some of the advanced computer organizations are also part of this course. The first block of the course explains Data Representation, Instruction Execution, Interrupts, Buses, Boolean algebra, Design of Logic Circuits, etc. The second block deals with the Memory System, The Memory Hierarchy, Secondary Storage technologies, the concepts of high speed memory, Cache Organisation, Input Output interfaces, Input Output techniques, DMA, Input Output processors, External Communication Interfaces, Interrupt Processing, BUS arbitration, etc. The third block deals with the Central Processing Unit. It includes the Instruction Set, the Instruction format, the Instruction Set Architecture, Micro-Operations, the organization of Arithmetic logic unit, Design of simple units of ALU, the Control Unit, The hardwired control, Wilkes control, the Micro-programmed control etc. The fourth block deals with the Assembly Language Programming, Microprocessor, RISC, and various types of multiprocessor technologies. Block and Unit Structure

Block 1: Data Representation and Logic Circuits

Unit 1: A Computer System

Different Architectures of Computer Systems Von Neumann Architecture Instruction Set Architecture CISC and RISC Mobile Architecture Multi-processor Architectures Instruction and its Execution using Simple Register Set

Unit 2: Data Representation

Number System Conversions of various types of Numbers Character Representation – ASCII, UNICODE (UTF 8 and UTF 16) Negative Number Representation using Complements Fixed Point Representation Floating Point Representation Normalized Mantissa, biased Exponent, precision IEEE Format for single and double precision numbers with examples Error Detection Codes Parity Bit Single Error Correcting Code Computer Arithmetic Addition and Subtraction Multiplication and Division

Unit 3: Logic Circuits - Introduction

Digital Logic Boolean algebra Logic Gates Combinational Circuits Canonical forms, Minterm, Maxterm Combinational Circuits simplification using Boolean Algebra and K-map Design of

circuits using NAND, NOR, AND, OR, NOT gates Examples of Combinational Circuits Adders, Decoders, Multiplexer, Encoder, Programmable Logic Array, Read Only Memory ROM, Adder-Subtractor

Unit 4: Logic Circuits – Sequential Circuits

Flip Flops - Basic latch and its working Clocked flip flops (S-R, D, J-K, T with Logic diagram, characteristics table and Excitation Tables) Master Slave Flip Flops and Edge Triggered Flip-flops Examples of Sequential Circuits (Registers, Counters – Asynchronous Counters, Synchronous Counters, RAM) 20 Sequential Circuit Design Example using 2 bit counter

Block 2: Memory and Input/Output Organisation

Unit 5: The Memory System

The Memory Hierarchy SRAM, ROM, DRAM, Flash Memory, Secondary Memory, Auxiliary Memory Hard Disk Drives, Optical Memories, SSD, CCDs, Bubble Memories (Characteristics: Drive Speed, Access Time, Rotation Speed, Partitioning & Formatting, Hard Drive Interface, Removable Drives (CD-ROM & DVD-ROM), Removable Storage Options, Blue Ray discs. RAID and its Levels

Unit 6: Advance Memory Organisations

Locality of Reference -Spatial, temporal, sequential Cache Memory, Cache Organisation Associative Memory Interleaved Memory Virtual Memory

Unit 7: Input/Output Organisation

Input / Output Devices or External or Peripheral Device, I/O Interface/ External Communication Interfaces Memory Mapped I/O and Isolated I/O Input Output Interface, Interrupts Modes of Transfer, Priority Interrupt, DMA, Serial Communication. The Device Controllers and its Structure, Device Drivers, Plug and Play Input Output Techniques (Programmed Input /Output, Handshaking, Interrupt Driven Input /Output, Interrupt Processing DMA (Direct Memory Access), Input Output Processors

Unit 8: Device Technology

Keyboard, Mouse, Video Cards, Monitors, Liquid Crystal Displays (LCD), LEDs, Digital Camera, Sound Cards, Printers, Modems, Scanners

Block 3: The Processing Unit

Unit 9: Instruction Set Architecture

Instruction Set Characteristics and Design Considerations Operand Data Types, Types of Instructions, Stored Program Organization, Number of Addresses and Instruction size Instruction Set and Format Design Issues (Instruction Length, Allocation of Bits among Opcode and Operand, Variable Length of Instructions, Example of Instruction Format. Addressing Schemes Immediate Addressing, Direct Addressing, Indirect Addressing, Register Addressing, Register Indirect Addressing, Indexed Addressing Scheme, Base Register Addressing, Relative Addressing Scheme, Stack Addressing

Unit 10: Registers, Micro-Operations and Instruction Execution

Register Organization (Programmer Visible Registers, Status and Control Registers), Register Transfer Language, Bus and Memory Transfers Arithmetic, Logic and Shift Microoperations, Instruction Execution and Microoperations, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input-Output, Interrupt, Instruction Pipelining, ALU Organisation

Unit 11: The Control Unit

Hardwired Control, Wilkes Control Micro-Programmed Control The Micro-Instructions (Types of Micro-Instructions, Control Memory, Micro-Instruction Formats), The Execution of Micro-21 Program, Address Sequencing, Design issues of Control Unit.

Unit 12: Reduced Instruction Set Computer Architecture

Introduction to RISC Importance of RISC Processors Reasons for Increased Complexity High Level Language Program Characteristics RISC Architecture The Use of Large Register File Comments on RISC, RISC Pipelining

Block 4: Microprocessor and Advanced Architectures

Unit 13: Microprocessor Architecture

Structure of 8086 CPU (The Bus Interface Unit, Execution Unit (EU)) Register Set of 8086, Instruction Set of 8086 (only limited number of instructions to be explained -Data Transfer Instruction, 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 14: Assembly Language Programming

Use of Assembly Language programming, Machine Language, Assembly Language, Assembler, InputOutput Programming. 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 15: Assembly Language Programming

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), Modular Programming (The stack, FAR and NEAR Procedures, Parameter Passing in Procedures, External Procedures)

Unit 16: Advanced Architectures

Parallel Processing Pipelining Arithmetic Pipeline Instruction Pipeline Vector Processing Array Processors Multiprocessors Characteristics of Multiprocessors Interconnection Structures Interprocessor Arbitration Interprocessor Communication and Synchronization Cache Coherence Multicore Processors.

3. MCS-203 OPERATING SYSTEMS

4 Credits

Objectives

This is the core course on Operating Systems (OS). The main objectives of this course are:

To understand the OS role in the overall computer system

- To study the operations performed by OS as a resource manager
- To understand process concept, process concurrency, synchronization and Deadlocks

- To design and solve synchronization problems
- To understand the scheduling policies of OS
- To understand the different memory management techniques
- To understand the concepts of input/output, storage and file management
- To understand the goals and principles of protection
- To understand the advanced topics such as Multiprocessor Systems, Distributed OS and Mobile OS
- To study and compare different OS(Windows, Linux, Android and Ios) and compare their features.

Block and Unit Structure

BLOCK 1: Introduction to Operating Systems and Process Management

Unit 1: Operating System-An Overview

- What is an Operating System (OS)?
- Goals of an Operating System
- Generations of Operating Systems
- Types of Operating Systems
- Desirable Qualities of OS
- Operating Systems : Some Examples
- Functions of OS

Unit 2: Processes Concept of Process System Calls for Process Management

- Process Scheduling
- Scheduling Algorithms
- First Come First serve (FCFS)
 - Shortest Job First (SJF)
 - Round Robin (RR)
 - Shortest remaining time next (SRTN)
 - Priority Based Scheduling or Event Driven (ED) scheduling
- Performance evaluation of the Scheduling Algorithms

Unit 3: Interprocess Communication and Synchronization

- Interprocess Communication
- Interprocess Synchronization
- Semaphores
- Classical problems in concurrent programming
- Locks
- Monitors and Conditional Variables

Unit 4: Deadlocks

- Deadlocks
- Characterization of a Deadlock
- A Resource Allocation Graph
- Dealing with Deadlock Situations
 - Deadlock Prevention
 - Deadlock Avoidance
 - Deadlock Detection and Recovery
- Deadlock detection and recovery
 - Havender's Algorithm
 - Deadlock Prevention
- Deadlock Avoidance
- Banker's Algorithm

BLOCK 2: Memory Management, File Management and Security

Unit 1: Memory Management Overlays and Swapping

- Logical and Physical Address Space
- Single Process Monitor
- Contiguous Memory Methods
- Paging
 - Principles of operation
 - Page allocation
 - Hardware Support for Paging
 - Protection and Sharing
- Segmentation
 - Principles of operation
 - Address Translation
 - Protection and Sharing

Unit 2: Virtual Memory

- Virtual Memory
 - Principles of operation
 - Virtual Memory management
 - Protection and sharing
- Demand paging
- Page Replacement policies
- Thrashing
 - Working Set Model
 - Page Fault Rate
- Demand Segmentation
- Combined Systems
 - Segmented paging
 - Paged segmentation

Unit 3: I/O and File Management

- Organization of the I/O function
- I/O Buffering
- Disk Organization
- Disk Scheduling
- RAID
- Disk Cache
- Command language user's view of File
- System The System programmer's view of the file System
- The Operating systems' view of fileManagement
 - Directories
 - Disk Space Management
 - Disk address translation
 - File related system services
 - Asynchronous Input / Output

Unit 4: Security and Protection

- Security Threats
- Security Policies and Mechanisms

- Authentication
 - Passwords
 - Alternative Forms of Authentication
- Protection in Computer Systems
- Security Models
 - Access-Control Matrix
 - Mandatory Access Control
 - Discretionary Access Control
 - Rule-Based Access Control
 - Role-Based Access Control
 - The Take-grant Model
 - Multilevel Models

BLOCK 3:Advanced Topics in Operating Systems

Unit 1:Multiprocessor Systems

- Multiprocessor and Processor Coupling
- Types of Multiprocessor Operating System
 - Separate Supervisors
 - Master/Slave
 - Symmetric
- Multiprocessor OS Functions and Requirements

Unit 2: Distributed Operating Systems

- Characteristics of Distributed Systems
- Design Issues Involved in Distributed
- Systems Communication in Distributed Systems
- Clock Synchronization in Distributed
- Systems Mutual Exclusion
- Distributed File Systems
- Distributed Shared Memory
- Remote Procedure Calls
- Other Middleware Technologies

Unit 3: Mobile Operating Systems

- Introduction
- Objectives
- Mobile Devices – An Introduction
- Mobile Operating System
- Evolution of Mobile OS
- Need for the Mobile OS
- Characteristics of Smartphone OS
- Design Issues in Mobile OS
- Popular Mobile OS

Block 4: Case Studies (Windows, Linux, Android &IoS)

Unit 1: Case Study 1 – Windows 10

Unit 2: Case Study 2 - LINUX

Unit 3: Case Study 3 – ANDROID

Unit 4: Case Study 4 – IoS

- Link and Run the C Program
 - Run the C Program through the Menu
 - Run from an Executable File
 - Linker Errors
 - Logical and Runtime Errors

Unit 2: Data Types Operators and Expressions

- Character Set
- Identifiers and Keywords
 - Rules for Forming Identifiers
 - Keywords
- Data Types and Storage
- Data Type Qualifiers
- Variables
- Declaring Variables
- Initialising Variables
- Constants
 - Integer Constants
 - Floating Point Constants
 - Character Constants
 - String Constants
 - Symbolic Constants
- Preprocessor directives
- Assignment Statements
- Arithmetic Operators
- Relational Operators
- Logical Operators
- Comma and Conditional Operators
- Type Cast Operator
- Size of Operator
- C Shorthand
- Priority of Operators

Unit 3: 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 4: Arrays& Strings

- 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
- Declaration and Initialization of Strings
- Display of Strings Using Different Formatting Techniques
- Array of Strings
- String Functions and Applications

BLOCK 2: Functions, Structures, Pointers and File Handling in C

Unit 5: 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

Unit 6: 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
- Bit fields

Unit 7: Pointers

- Pointers and their Characteristics
- Address and Indirection Operators
- Pointer Type Declaration and Assignment
 - Pointer to a Pointer
 - Null Pointer 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 8: File Handling

- 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 Unbuffered I/O - The UNIX like File Routines

PYTHON PROGRAMMING (BLOCK-3&4)

Block3: Introduction to Python Programming

Unit9: Introduction to Python

- History of Python
- Need of Python
- Packages for Cross platform application of Python
- Getting started with Python
- Program structure in python
- Running the First program

Unit10: Data Structures and control statements in Python

- Data Types
- Data Structures
 - Arrays
 - Linked Lists
 - Stacks
 - Queues
- Sequence, Selection and Iteration constructs
- Recursion

Unit11: Functions and File Handling in Python

- Function definition and call
- Function Scope
- Arguments
- Function Objects
- Lambda Functions

- Anonymous Functions
- File Operations
- Creating. Opening and using files

Unit 12: Modules and Packages

- Module Creations and Usage
- Module Search Path
- Module Vs. Script
- Package Creation and Importing
- Standard Library Modules

Block4: Advanced Features in Python

Unit13: Classes in Python

- Introduction to Object Oriented Paradigms
- Classes and instances
- Classes method calls
- Inheritance and Compositions
- Static and Class Methods
- Operator Overloading
- Polymorphism

Unit14: Exception Handling in Python Programming

- Default Exception Handler
- Catching Exceptions
- Raise an exception
- User defined exception

Unit15: Advanced Concepts

- Decorators
- Generators
- Iterators
- Co-routines

Unit16: Data Access using Python

- Database concepts
- Creating database
- Querying Database
- Using SQL to get more out of database

6. MCSL-205 C and Python Lab

2Credits

Objectives:

Main objective of this laboratory course is to provide hands on exercises to the students based on Programming in C and Python course.

Lab Sessions:

- There will be 20 practical sessions (3 hours each) of which 10 sessions will be on C Programming and 10 sessions will be on Python.
- The practice problems for all 20 sessions will be listed session-wise in the lab manual.

Block 1 : C and Python Lab

Section 1: C Programming

Section 2: Python Programming

4.3 Detailed Syllabus of BCA_NEW Third Semester

1. MCS-208 Data Structures and Algorithms

4 Credits

Objectives

The student should become well versed with Algorithms and various data structures. S/he should be able to use them appropriately as per need during development of programs. Also, the student 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 course also includes Advanced Data Structures which will enable student to apply them in solving complex problems.

Block and Unit Structure

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, Pointers and Structures

- Arrays and Pointers
- Sparse Matrices
- Structures
- 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
- Skiplists
- 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
- Priority Queues
- 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
- Splay Trees

- Splaying steps
- Splaying Algorithm
- Red-Black trees
 - Properties of a Red-Black tree
- AA-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 and Sorting Techniques

- Linear Search
- Binary Search
- Applications
- Internal Sorting
 - Insertion Sort
 - Bubble Sort
 - Quick Sort
 - 2-way Merge Sort
 - Heap Sort
- Sorting on Several Keys
- External Sorting Algorithms

BLOCK 4: File Structures and Advanced Data Structures

Unit 10: Hashing

- Introduction
- Index Mapping
- Collision Handling
- Double Hashing
- Load Factor and Rehashing

Unit 11: Advanced Data Structures

- Scapegoat Trees
- Tries
- Binary Tries
- X-Fast Tries

- Y-Fast Tries

Unit 12: File Structures

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

2. MCSL-209 Data Structures and Algorithms Lab 2 Credits

Objectives:

Main objective of this laboratory course is to provide hands on exercises to the students based data Structures and Algorithms course.

Lab Sessions:

- There will be 20 practical sessions (3 hours each) of which 10 sessions will be on Data Structures Programming and 10 sessions will be on Algorithms
- The practice problems for all 20 sessions will be listed session-wise in the lab manual.

Block 1: Data Structures and Algorithms Lab

Section 1: Data Structures Lab

Section 2 : Algorithms Lab

3. MCS-207 Database Management Systems 4 Credits

Objective

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, e-commerce website and other activity that required permanence of data storage. Database management systems manage data more efficiently and effectively. This course provides the basic conceptual background necessary to design and develop simple database system. This course also provides you information about various types of database management system. After going through this course, a student will be able to:

- explain features of a DBMS and various database models
- create conceptual database model like E-R models and create a relational database design
- write relational algebraic and SQL queries including static and dynamic SQL queries
- normalize a database design
- explain the features of transactions, Recovery, Concurrency and Security in DBMS.

Block and Unit Structure

Block 1: Introduction to DBMS

Unit 1: Database Management System – An Introduction

Need for a Database Management System

Logical DBMS Architecture - Three level architecture of DBMS

Mappings between levels and data independence

Physical DBMS Structure - DML Precompiler, DDL Compiler, File Manager, Database Manager, Query Processor, Database Administrator, Data files indices and Data Dictionary

Introduction to Different Data

Models and Current Trends

Unit 2: Relational Database

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)

Example of queries using relational algebra

Unit 3: ER Model

Entity Relationship (ER) Model

(Entities, Attributes, Relationships)

E-R Diagram

Enhanced ER tools

(Subclasses, Super class, and Inheritance, Specialization and Generalization, Constraints and Characteristics of Specialization and Generalization)

Converting ER and EER diagram to tables

Unit 4: File Organisation in DBMS

Physical Database

Storage of Database on Hard Disks

File Organisation and Its Types

Sequential File Organisation, Indexed File Organisation, Hashed File Organisation

Types of Indexes, Index and Tree Structure, Multi-key File Importance of File Organisation in Databases

Block 2: Normalisation and Database Queries

Unit 5: Integrity, Functional Dependence and Normalization

Relational Database Integrity (The Keys, Referential Integrity, Entity Integrity)

Redundancy and Associated Problems

Functional Dependencies

Normalization (The First Normal Form, The Second Normal Form, The Third Normal Form,

Boyce Codd Normal Form

Desirable Properties of Decomposition with examples

Unit 6: Higher Normal Forms

Multi value dependency

4NF

Join Dependency

5NF

Introduction to other normal form

Unit 7: Structured Query language

Data Definition Language
Data Manipulation Language
Data Control Language
SQL Introduction
Aggregate functions, Group by and having clause

Unit 8: Complex Queries

Joins
Equi join, self join, outer joins etc.
Sub-queries and correlated sub-queries
Views, Sequences, Indexes, Synonyms
Nested Queries

Unit 9: Advanced SQL

Assertion and views
Cursors, triggers and stored procedures
Embedded SQL
Dynamic SQL
Advanced Features of SQL

Block 3: Database Transactions, Recovery and Security

Unit 10: Transaction Management

The Transactions and its Properties
The Concurrent Transactions and associated problems
The Locking Protocol (Serialisable Schedules, Locks, Two Phase Locking (2PL) Deadlock and its Prevention Deadlock Handling,
Optimistic Concurrency Control
Timestamp based Protocol
Multi-version Schemes
Weak Levels of Consistency
SQL commands for Transactions

Unit 11: Database Recovery and Security

Recovery and Atomicity
Recovery with Concurrent Transaction
Checkpointing
Buffer Management
Levels of database security
Access control
Audit trails in the databases
Relationship between Security and Integrity
SQL support for recovery and security

Unit 12: Query Evaluation

Measures of Query Cost (Selection Operation,,Sorting, Join Operation, other Operations)
Evaluation of Expression
Transformation of Relational Expressions
Role of Relational Algebra in query optimization

Estimating Statistics of Expression
Choice of Evaluation Plans
Views and query processing
Storage and query optimization.

Block 4: Introduction to Advanced Database Models

Unit 13: Object Oriented Database

Unit 14: Data Mining and Data Warehousing

Unit 15: NOSQL databases

Unit 16: Emerging Database Models

4. BCS-131 Programming in C++

4 Credits

Objectives:

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.

Unit 2: Introduction to C++

Genesis of C++, Structure of a C++ program, Data Types, Operators and Control Structures.

Unit 3: 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-135 DBMS and C++ Lab

2 Credits

Objective:

This laboratory course is based Database Management Systems. Main objective of this laboratory course is to provide hands on exercises to the students based on Database Management Systems.

Lab Sessions: There will be 20 practical sessions (3 hours each) of which 10 sessions will be on DBMS and 10 sessions will be on C++ Lab. The practice problems for all 20 sessions will be listed session-wise in the lab manual.

Objectives:

Objective of this course is to provide hands on experience to the students in C++ programming. Students 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.

Block 1: DBMS Lab and C++ Lab

Section 1: Database Management Systems

Section 2: C++ Lab

6. BCS-040 Statistical Techniques

4 Credits

BLOCK 1: Statistics and Probability

Unit1: 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.

BLOCK 2: Statistical Inference

Unit4: Sampling Distributions

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

Unit5: 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.

Unit6: Tests of Significance

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

Unit7: Applications of Chi-Square in Problems with Categorical Data

Goodness-of-fit, Test of Independence.

BLOCK 3: Applies Statistical Methods

Unit8: 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, Pair wise 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.

Unit10: 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.

Unit11: 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.

BLOCK 4: Sampling

Unit12: 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.

Unit13: 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.

Note: There may be some minor changes in the syllabus of BCS-040.

5.4 Detailed Syllabus of BCAOL Fourth Semester

1. MCS-206 Object Oriented Programming using Java 4 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. Java is one of the prominent programming language for Object Oriented Programming. This Course is designed to give you exposure to the concepts of object-oriented programming using java. It will help in learning to write programs in java using object-oriented concepts and features of java including exceptions handling and multithreading. Also this course will teach students to use java API, Stream classes, GUI in java, and use of JDBC in applications development.

Block and Unit Structure

BLOCK 1: Java Fundamentals

Unit 1: Introduction to Java

- Introduction to Object Oriented
- Programming Features of Java (OOP, robustness, multithreading, networking, Interpreted and High Performance, Distributed, dynamic etc))
JDK, JRE, JIT, JVM
- Environment setup for java development (First java program)

Unit 2: Basics of Java

- Data Type
- Unicode
- Variables
- Operators
- Statements/expression
- Example Program with use of Scanner
- Class

Unit 3: Decisions and Loops

- Array
- Decision Constructs
- Loop Constructs

Unit 4: Class and Objects

- Class Fundamentals
- Declaring Objects

- Object Lifecycle (creation, "dereference by reassignment" and garbage collection) Methods(Getter and Setter)
- Encapsulation
- Access Modifier/Specifier
- Constructors in Java
- Garbage Collection
- The Finalize () Method

BLOCK 2: Inheritance, Polymorphism and Packages

Unit 1: Inheritance

- Basics of Inheritance
- Advantages of Inheritance
- Member Access and Inheritance
- Types of Inheritance
- Use of Super Keyword
- Creating Multilevel Class Hierarchy
- Demonstrating Order of Constructors
- Execution Use of Final Keyword

Unit 2: Polymorphism

- Introduction to Polymorphism
- Advantages of Polymorphism
- Types of Polymorphism
- Method Overloading
- Method Overriding
- Abstract Class
- Application of Abstract Class

Unit 3: Assertions and Exception Handling

- Assertion and its use
- Fundamentals of Exception Handling
- Features of Exception
- Types of Exception
- Exceptions Handling in Java
- Multiple Catch Clauses
- Throw
- Throws
- Finally
- Java Built-in Exceptions
- Creating Own Exception Subclasses

Unit 4: Packages and Interfaces

- Package
- Access Rules in Packages
- Finding Packages and CLASSPATH
- Creating Own Packages
- Importing Packages
- Basics of Interface in Java
- Defining , Implementing and Applying
- Interface Default Interface Methods

- Issues of Multiple Interfaces
- Use of static Methods in an Interface

BLOCK 3: Multithreading and I/O

Unit: 1 Multithreading

- Multithreading
- Java thread Model
- Creating Threads in Java
- Implanting Runnable Interface
- Extending Thread Class
- Thread Life Cycle
- Creating Multiple Threads
- Using isAlive() and join()
- Thread Priority
- Synchronization
- Interthread Communication
- Suspending , Resuming, and Stopping
- Threads Obtaining a Thread State
- Using Multithreading

Unit 2: Number and Strings (String, StringBuilder, string buffer)

- Number Class and its Methods
- String Class and its Methods
- StringBuilder Class and its Methods
- StringBuffer Class and its Methods

Unit 3: I/O Streams

- Introduction to I/O Class and Interfaces
- File Class and its Methods
- The AutoClonable, Clonable and
- Flushable Interfaces I/O Exceptions
- Introduction to the Stream Classes
- Byte Stream Classes
- Character Stream Classes
- The Clonable Class
- Serialization

Unit 4: Java API

- Date and Time
- Set
- Map
- HashMap
- Stack
- Vector
- List

Block 4: Graphical User Interface and Java Database Connectivity

Unit1: Introduction to GUI in Java

- Introduction to AWT / Swing/ JavaFX

- Features of JavaFX
- User Interface Components of JavaFX
- Work with Layouts
- Add Text
- Add HTML Content

Unit2: Working with UI Controls

- Skin Applications with CSS
- Build UI with FXML
- Event Handling in JavaFX
- Effects, Animation, and Media

Unit3: JDBC Part-1

- JDBC Introduction
- JDBC Driver
- JDBC Database Connection Steps
- JDBC Driver Manager Class
- JDBC Statement Interface
- Prepared Statement
- Callable Statement

Unit4: JDBC Part 2

- JDBC ResultSet Interface
- JDBC Transactions
- JDBC Batch Processing
- JDBC RowSet Interface
- Introduction to Java Data Object (JDO)

2. BCSL-146 Object Oriented Programming using Java Lab

2 Credits

Objective: This laboratory course is based on Object Oriented Programming using Java. Main objective of this laboratory course is to provide hands on exercises to the students based on Object Oriented Programming using Java.

Lab Sessions:

There will be 10 practical sessions (3 hours each) of which 10 sessions will be on Java Programming.

Section 1: Java Programming

3. BCS-053 Web Programming

2 Credits

Objectives:

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

- Use XHTML tags to create simple static web pages;
- Format simple Web page using Cascading Style sheets;
- State the concepts applicable to web programming;

- Create an interactive and dynamic Website using JavaScript;
- Represent data over the Web using XML;
- Appreciate the use of Ajax and Rich Internet Applications, and
- Perform server side scripting using Java Server Pages(JSP).

BLOCK 1: Client Side

Unit1: 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.

Unit2 : Using Style Sheets

CSS: Inline Styles, Embedded Style Sheets, Linking External Style Sheets, Style Specification Formats Selector Forms, Colour, Property Value Forms, Font Properties, ListProperties, Alignment of Text, The Box Model, Background Image, theand<div>Tags.

Unit3: Introduction to XML

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

Unit4: Programming with Java Script–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.

Unit5: 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

Unit1: 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.

Unit2: 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.

Unit3: JSP –Applications

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

Unit4: JSP Application Development

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

4. BCSL-147:Web Programming Lab

2 Credits

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

Session wise coverage:

Session1 : Using Web2.0andcreatingpagesusingXHTML.

Session2 : Creating Style Sheets for the web pages created in session.

Session3 : Creating sample XML document and displaying it.

Session4 : WML.

Session5 and 6 : Using and writing Java Script in web pages, including event s and Ajax.

Session7,8 : Using JSP.

Session9,10 :Writing simple applications using JSP and JDB and deploying it.

5. BCS-041: Fundamental of Computer Networks

4 Credits

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

Unit 1: 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.

Unit 3: Application Layer

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

Unit 4: 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.

6. BCOC-131: FINANCIAL ACCOUNTING

6 Credit

BLOCK 1: THEORETICAL FRAMEWORK

Unit 1: Nature and Scope of Accounting

Unit 2: Accounting Process and Rules

Unit 3: Accounting Principles

Unit 4: Accounting Standards

BLOCK 2: ACCOUNTING PROCESS

Unit 5: Journal and Ledger

Unit 6: Subsidiary Books

Unit 7: Trial Balance and Rectification of Errors

BLOCK 3: FINAL ACCOUNTS

Unit 8: Depreciation

Unit 9: Final Accounts-I

Unit 10: Final Accounts-II

BLOCK 4: HIRE PURCHASE AND INLAND BRANCHES

Unit 11: Hire Purchase-I

Unit 12: Hire Purchase-II

Unit 13: Branch Accounts-I

Unit 14: Branch Accounts-II

BLOCK 5: CONSIGNMENTS AND JOINT VENTURES

Unit 15: Consignments-I

Unit 16: Consignments-II

Unit 17: Joint Venture

BLOCK 6: COMPUTERISED ACCOUNTING

Unit 18: Introduction to computer Accounting and Creation of Company

Unit 19: Creating Masters

Unit 20: Voucher Entries and Invoicing

Unit 21: Preparation of Reports

5.5 Detailed Syllabus of BCA_NEW Fifth Semester

1. BCS-151: 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; and
- 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-042: Introduction to Algorithms Design

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

Unit 1: 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.

Unit 2: Asymptotic Bounds

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

Unit 3: 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.

3. BCSL-159 Introduction to Algorithm Design Lab

2 Credit

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

4. BCOS-184: E-COMMERCE

4 Credit

E-Commerce will facilitate using computer software, manage data to make data-driven decisions, and prepare statistical reports, spreadsheets, presentations, publications, and web pages. In this course there are four blocks and in each block there are five units.

BLOCK 1: BASICS OF E-COMMERCE

Unit 1: Introduction to E-Commerce

Unit 2: E-Commerce: Business Models

Unit 3: Technology used in E-Commerce

Unit 4: Electronic Governance

BLOCK 2: E-PAYMENT SYSTEM

Unit 5: Electronic Payment

Unit 6: E-Banking

BLOCK 3: WEBSITE DEVELOPMENT AND HOSTING

- Unit 7: Website Development
- Unit 8: Electronic Commerce Software
- Unit 9: Web Server Hardware and Software

BLOCK 4: CYBER SECURITY & INFORMATION ACT

- Unit 10: Cyber Security
- Unit 11: Cyber Security Measures
- Unit 12: IT Act 2000

BLOCK 5: ONLINE PORTAL AND APP: BUSINESS, SHOPPING & SERVICES

- Unit 13: Online Shopping / E-Tailing
- Unit 14: Online Services
- Unit 15: App Based Commerce

6. MSEI-023 Cyber Security 4 Credits

BLOCK 1: Information Gathering

- Unit 1: Social Engineering
- Unit 2: E-Mail Crime & Investigation
- Unit 3: Reverse Engineering
- Unit 4: Cracking methodology

BLOCK 2: Database Security

- Unit 1: Introduction to Database Concepts
- Unit 2: Hands-on Database Usage and Hacking Attempt
- Unit 3: Database Security – I
- Unit 4: Database Security –II

BLOCK3: Web Technology

- Unit 1: Introduction to Web Architecture
- Unit 2: Client Side Scripts
- Unit 3: Server Side Scripts
- Unit 4: Attacks on Web Application

BLOCK4: Internet Technology

- Unit 1: Internet Architecture
- Unit 2: Social Networking Sites
- Unit 3: Advanced Searching Techniques
- Unit 4: Latest Trend in Internet Securities

7. BECS 184 Data Analysis 4 credits

BLOCK 1: Review of Mathematical and Statistical Concepts

- Unit 1: Mathematical Concepts
- Unit 2: Statistical Concepts
- Unit 3: Introduction to Statistical Software

BLOCK 2: Data Collection and Presentation of Data

- Unit 4: Data Collection: Methods and Sources
- Unit 5: Tools of Data Collection
- Unit 6: Data Presentation

BLOCK 3 Analysis of Quantitative Data

- Unit 7: Univariate Data Analysis
- Unit 8: Bivariate Data Analysis

Unit 9: Multivariate Data Analysis

BLOCK 4: Composite Index Numbers and Qualitative Data

Unit 10: Composite Index Numbers

Unit 11: Analysis of Qualitative Data

4.6 Detailed Syllabus of BCA_NEW Sixth Semester

1. BCOS-185 ENTREPRENEURSHIP

4 Credits

BLOCK 1: ENTREPRENEURSHIP: A PERSPECTIVE

Unit 1: An Introduction to Entrepreneurship

Unit 2: Entrepreneurial Eco-system

Unit 3: Dimensions of Entrepreneurship

Unit 4: Entrepreneurs Competencies

BLOCK 2: BUSINESS IDEA SELECTION AND FEASIBILITY

Unit 5: Business Opportunity Identification and Selection

Unit 6: Market survey

Unit 7: Business Plan preparation-I

Unit 8: Business Plan Feasibility : I

Unit 9: Business Plan : Implementation

BLOCK 3: MOBILISING RESOURCES AND START-UP

Unit 10: Start-up initiatives

Unit 11: Mobilising Financial Resources

Unit 12: Mobilising Non-financial Resources

BLOCK 4: ENTREPRENEURSHIP AND MICRO, SMALL AND MEDIUM ENTERPRISES(MSMES)

Unit 13: Entrepreneurship Development and MSMEs

Unit 14: Family Businesses in India

Unit 15: Success Stories

2. MSEI-027 Digital Forensics

4 Credits

BLOCK 1: Cyber Crime and Cyber Forensics

Unit 1: Various Types of Cyber Crimes

Unit 2: Banking and Financial Crimes

Unit 3: Identify Thefts and Data thefts/Source Code Thefts

Unit 4: Spam and Botnets

BLOCK 2: Digital Forensics : Tools and Techniques

Unit 1: Digital Investigation

Unit 2: Data Acquisition and Information Gathering

Unit 3: Forensic Examination of Systems

Unit 4: Forensic Examination of Network Devices

BLOCK 3: Mobile Forensics

Unit 1: Introduction to Mobile Forensics and Technologies

Unit 2: Analysis of CDR's

Unit 3: Application of SIM Card Reader's

Unit 4: Forensic Examination of Mobile Devices

BLOCK4: Security Issues in Wireless Technologies

Unit 1: Introduction to Wireless technologies

- Unit 2: Wireless Devices
- Unit 3: Securing Wireless Network
- Unit 4: Ethical Hacking-Wireless Security

3. BCSP-165: Project

12 Credits

The objective of the BCA_NEW 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 students a platform to demonstrate their practical and theoretical skills gained during five semesters of study in BCA_NEW 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_NEW final semester project. The courses studied by the students during the BCA_NEW 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 may also download Project Guidelines from IGNOU Website. Students should strictly follow and adhere to the BCSP-064 project guidelines.

Software requirement for BCA_NEW / BCA_NEW Laboratory Courses

S.No.	Course Code	Course Title	Software Requirement(s)
1.	BCSL-013	Computer Basics and PC Software Lab	Latest Windows OS(XP onwards) and Office 2005 onwards
2.	MCSL-204	WINDOWS AND LINUX Lab	Windows Operating System Linux Operating System
3.	MCSL-205	C and Python Lab	For C: .Compilers of C/C++ for Windows or Unix For Python Anaconda (open source software for Python), GoogleColabs
4.	MCSL-209	Data Structures and Algorithms Lab	Any C programming language compiler
5.	BCSL-135	DBMS and C++ Lab	For DBMS Lab Two alternatives that can be used are: a) MS Access – this is a common and cheaply available software along with the MS Office Professional. It is very useful for making small data bases OR b) SQL with PHP interface. These are open source software that can be used to write SQL commands, PHP can be used to support interface. For C++ Lab Borland C++, VC++, Visual Studio etc.
6.	BCSL-146	Object Oriented Programming using	Oracle JDK 8 onwards

		Java Lab	
7.	BCSL-147	Web Programming Lab	Java/J2EE and Tomcat Webserver, MySQL
8.	BCSL-159	Introduction to Algorithm Design Lab	Borland C/ Borland C++ /Visual studio (VC++).
9.	MSEI-023	Cyber Security	Internet Explorer, opera, SQL *Plus, Notepad
10.	MSEI-027	Digital Forensics	Any key logger, Internet access, Mac spoofers, Mail bombing tool, Windows/linux Operating System with Admin/Root privilege, Nessus/Win Audit, Any HTML Editor

5. EVALUATION SCHEME

5.1 Evaluation/ Marking Scheme of BCA_NEW : Completion of the programme requires successful completion of both assignment component and the Term-end Examination component for each of the courses in the programme. The total numbers of courses in BCA_NEW are 32 (including a Project Course) and the total number of credits are 120.

AWARD	Course Code	Course Title	Credits	School	
B D C A I E C H E L O M F O R I N T E C O M P U T E R A P P L I C A T I O N S B C A	SEMESTER I				
		BEVAE-181	Environmental Studies	4	SOS
		BEGLA-136	English at Work Place	6	SOH
		BCS-111	Computer Basics and PC Software	4	SOCIS
		BCSL-013	Computer Basics and PC Software Lab	2	SOCIS
		BCS-012	Basic Mathematics	4	SOCIS
		Total Credits:		20	
		SEMESTER II			
		FEG-02	Foundation Course in English-2	4	SOH
		MCS-202	Computer Organisation	4	SOCIS
		MCS-203	Operating Systems	4	SOCIS
		MCSL -204	WINDOWS and LINUX Lab	2	SOCIS
		MCS-201	Programming in C and Python	4	SOCIS
		MCSL- 205	C and Python Lab	2	SOCIS
		Total Credits:		20	
		SEMESTER III			
		MCS-208	Data Structures and Algorithms	4	SOCIS
		MCSL -209	Data Structures and Algorithms Lab	2	SOCIS
		MCS-207	Database Management Systems	4	SOCIS
		BCS- 131	Programming in C++	4	SOCIS
		BCSL-135	DBMS and C++ Lab	2	SOCIS
		BCS -040	Statistical Techniques	4	SOCIS
		Total Credits:		20	
		SEMESTER IV			
		MCS-206	Object Oriented Programming using Java	4	SOCIS
		BCSL-146	Object Oriented Programming using Java Lab	2	SOCIS
		BCS -053	Web Programming	2	SOCIS
		BCSL-147	Web Programming Lab	2	SOCIS
		BCS -041	Fundamentals of Computer Networks	4	SOCIS
		BCOC-131	Financial Accounting	6	SOMS
		Total Credits:		20	
		SEMESTER V			
	BCS- 151	Introduction to Software Engineering	4	SOCIS	
	BCS – 042	Introduction to Algorithm Design	2	SOCIS	
	BCSL-159	Introduction to Algorithm Design Lab	2	SOCIS	
	BCOS - 184	E-Commerce	4	SOMS	
	MSEI-023	Cyber Security	4*	SOVET	
	BECS-184	Data Analysis	4	SOSS	
	Total Credits:		20		
	SEMESTER VI				
	BCOS -185	Entrepreneurship	4	SOMS	
	MSEI-027	Digital Forensics	4*	SOVET	
	BCSP-165	Project	12	SOCIS	
	Total Credits:		20		

Note:

- i) Practical examination will be conducted for the lab courses only. The letter 'L' in the course code represents the lab course. Pass in each and every part in the practical course of Term-End Practical Examination is compulsory in order to get it declared successful in the respective course. The practical examination includes Viva Voce only.
- (i) ** 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 Project Evaluation and (ii)Viva-voce.

Multiple Exit Scheme:

This is with reference to the IGNOU notificationNo. IG/SRD/R-iV/2022/974 ndated 24-August-2022.

- 1) Completion of First and Second semester awards "Undergraduate Certificate in Computer Applications".
- 2) Completion of First, Second, Third and Fourth semester by awards "Undergraduate Diploma in Computer Applications"

EVALUATION METHODOLOGY FOR THE AWARD OF CERTIFICATE IN COMPUTER APPLICATIONS

Evaluation methodology for the award of "Undergraduate Certificate in Computer Applications"

SEMESTER	COURSE CODE	CREDITS	CONTINUOUS EVALUATION(CE)			TERM END THEORY			TERM END PRACTICAL			MARK'S WEIGHTAGE FOR COURSE FOR FINAL MARKS COMPUTATION
			ASSIGNMENT(MAXIMUM)	ASSIGNMENT(MINIMUM)	WEIGHTAGE OF CE	TEE THEORY MAXIMUM	TEE THEORY MINIMUM	WEIGHTAGE OF TEE THEORY	TEE PRACTICAL MAXIMUM	TEE PRACTICAL MINIMUM	WEIGHTAGE OF TEE PRACTICAL	
SEMESTER-1	BCS111	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50
	BCS012	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50
	BCSL013	2	100	40	25%	NIL	NIL	NIL	100	40	75%	25
SEMESTER-2	* BEGLA136	6	100	35	30%	100	35	70%	NIL	NIL	NIL	100
	* BEVAE181	4	100	35	30%	50	17.5	70%	NIL	NIL	NIL	50
	FE602	4	100	35	30%	50	17.5	70%	NIL	NIL	NIL	50
SEMESTER-1	MCS201	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50
	MCS202	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50
	MCS203	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50
SEMESTER-2	MCSL204	2	100	40	30%	NIL	NIL	NIL	50	20	70%	25
	MCSL205	2	100	40	30%	NIL	NIL	NIL	50	20	70%	25
TOTAL											525	

This is with reference to the IGNOU notification No. IG/SRD/R-IV/2022/974 dated 24-August-2022 and its Approval in the 60th School Board of SOCIS(Item No. 60.6).

The BCA_NEW and BCA_NEWOL programme of SOCIS is of 120 credits (Each year is of 40 Credits)

Therefore the Multiple exit option may be provided to the learners who successfully completed :

- 1) First and Second semester by awarding "Undergraduate Certificate in Computer Applications".
- 2) First, Second, Third and Fourth semester by awarding "Undergraduate Diploma in Computer Applications"
- 3) * - The Evaluation Methodology is as per the Adopted Course

EVALUATION METHODOLOGY FOR THE AWARD OF DIPLOMA IN COMPUTER APPLICATIONS

Evaluation methodology for the award of "Undergraduate Diploma in Computer Applications"

SEMESTER	COURSE CODE	CREDITS	CONTINUOUS EVALUATION(CE)				TERM END THEORY			TERM END PRACTICAL			MARKS WEIGHTAGE FOR COURSE FOR FINAL MARKS
			ASSIGNMENT (M)	ASSIGNMENT (M)	WEIGHTAGE OF CE	TEE THEORY MAXIMUM	TEE THEORY MINIMUM	WEIGHTAGE OF TEE THEORY	TEE PRACTICAL MAXIMUM	TEE PRACTICAL MINIMUM	WEIGHTAGE OF TEE PRACTICAL		
SEMESTER-1	BCS111	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50	
	BCS012	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50	
	BCSL013	2	100	40	25%	NIL	NIL	NIL	100	40	75%	25	
SEMESTER-1	* BEGA136	6	100	35	30%	100	35	70%	NIL	NIL	NIL	100	
	* BEVAE181	4	100	35	30%	50	17.5	70%	NIL	NIL	NIL	50	
SEMESTER-2	FEG02	4	100	35	30%	50	17.5	70%	NIL	NIL	NIL	50	
	MCS201	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50	
	MCS202	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50	
	MCS203	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50	
	MCSL204	2	100	40	30%	NIL	NIL	NIL	50	20	70%	25	
SEMESTER-3	MCSL205	2	100	40	30%	NIL	NIL	NIL	50	20	70%	25	
	BCS -040	4	100	35	25%	50	17.5	75%	NIL	NIL	NIL	50	
	BCS- 131	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50	
	BCSL-135	2	50	20	25%	NIL	NIL	NIL	50	20	75%	25	
	MCS-207	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50	
SEMESTER-4	MCS-208	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50	
	MCSL-209	2	100	40	30%	NIL	NIL	NIL	50	20	70%	25	
	BCS -041	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50	
	BCS -053	2	100	40	25%	50	20	75%	NIL	NIL	NIL	25	
	BCSL-146	2	50	20	25%	NIL	NIL	NIL	50	20	75%	25	
TOTAL	BCSL-147	2	50	20	25%	NIL	NIL	NIL	50	20	75%	25	
	MCS-206	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50	
	* BCDC-131	6	100	35	30%	100	35	70%	NIL	NIL	NIL	100	

This is with reference to the IGNOU notificationNo. (G)/SRD/R-IV/2022/974 dated 24-August-2022 and its Approval in the 60th School Board of SOCIS(Item No. 60.6).

The BCA_NEW and BCA_NEWOL programme of SOCIS is of 120 credits (Each year is of 40 Credits)

Therefore the Multiple exit option may be provided to the learners who successfully completed :

- 1) First and Second semester by awarding "Undergraduate Certificate in Computer Applications."
- 2) First, Second, Third and Fourth semester by awarding "Undergraduate Diploma in Computer Applications."
- 3) * - The Evaluation Methodology is as per the Adopted Course

OVERALL EVALUATION METHODOLOGY FOR AWARD OF BACHELORS OF COMPUTER APPLICATIONS

		CONTINUOUS EVALUATION				TERM END THEORY				TERM END PRACTICAL				MARKS FOR COURSE FOR FINAL MARKS COMPUTATION
SEMESTER	COURSE CODE	CREDITS	ASSIGNMENT (MAXIMUM)	ASSIGNMENT (MINIMUM)	WEIGHTAGE OF CE	TEE THEORY MAXIMUM	TEE THEORY MINIMUM	WEIGHTAGE OF TEE THEORY	TEE PRACTICAL MAXIMUM	TEE PRACTICAL MINIMUM	WEIGHTAGE OF TEE PRACTICAL			
SEMESTER-1	BCS012	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50		
	BCS111	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50		
	BCS1013	2	100	40	25%	NIL	NIL	NIL	100	40	75%	25		
	- BEGLA136	6	100	35	30%	100	35	70%	NIL	NIL	NIL	100		
SEMESTER-2	- BEVAE161	4	100	35	30%	50	17.5	70%	NIL	NIL	NIL	50		
	FEQ02	4	100	35	30%	50	17.5	70%	NIL	NIL	NIL	50		
	MCS201	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50		
	MCS202	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50		
SEMESTER-3	MCS203	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50		
	MCS1204	2	100	40	30%	NIL	NIL	NIL	50	20	70%	25		
	MCS1205	2	100	40	30%	NIL	NIL	NIL	50	20	70%	25		
	MCS-206	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50		
SEMESTER-4	MCS1-209	2	100	40	30%	NIL	NIL	NIL	50	20	70%	25		
	MCS-207	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50		
	BCS- 131	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50		
	BCS-135	2	50	20	25%	NIL	NIL	NIL	50	20	75%	25		
SEMESTER-5	BCS-040	4	100	35	25%	50	17.5	75%	NIL	NIL	NIL	50		
	MCS-206	4	100	40	30%	100	40	70%	NIL	NIL	NIL	50		
	BCS1-146	2	50	20	25%	NIL	NIL	NIL	50	20	75%	25		
	BCS-053	2	100	40	25%	50	20	75%	NIL	NIL	NIL	25		
SEMESTER-6	BCS1-147	2	50	20	25%	NIL	NIL	NIL	50	20	75%	25		
	BCS-041	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50		
	- BCOG-131	6	100	35	30%	100	35	70%	NIL	NIL	NIL	100		
	BCS- 151	4	100	40	25%	100	40	75%	NIL	NIL	NIL	50		
SEMESTER-7	BCS - 042	2	100	40	25%	50	20	75%	NIL	NIL	NIL	25		
	BCSL-153	2	50	20	25%	NIL	NIL	NIL	50	20	75%	25		
	- BCOG - 184	4	100	35	30%	100	35	70%	NIL	NIL	NIL	50		
	- MSEI-023	4	20	10	10%	50	25	30%	100	50	60%	50		
SEMESTER-8	- BEGS-184	4	100	35	30%	100	35	70%	NIL	NIL	NIL	50		
	- BCOG - 185	4	100	35	30%	100	35	70%	NIL	NIL	NIL	50		
	- MSEI-027	4	100	35	30%	100	35	70%	NIL	NIL	NIL	50		
	BCSP-165	12	20	10	10%	50	25	30%	100	50	60%	50		
TOTAL												200	1600	

This is with reference to the IGNOU notification No. JG/SRD/R--VI/2022/974 dated 24-August-2022. The Bca_NEW and BCA_NEWOL programme of SOCS is of 120 credits (Each year is of 40 Credits)

Therefore the Multiple exit option may be provided to the learners who successfully completed :
 1) First and Second semester by awarding "Undergraduate Certificate in Computer Applications"-
 2) First, Second, Third and Fourth semester by awarding "Undergraduate Diploma in Computer Applications"-
 3) - The Evaluation Methodology is as per the Adopted Course

**OVERALL EVALUATION METHODOLOGY FOR AWARD OF
BACHELORS OF COMPUTER APPLICATIONS**

Courses	Evaluation Methodology
BCS-111, BCS-012, BCS-131, BCS-151, BCS-041	(a) Continuous Evaluation: Max. Marks:100, Min.Marks:40, Weightage:25% (b) Term End Examination: Max. Marks: 100, Min. Marks 40, Weightage: 75% Duration of TEE: 3 hours
BCSL-146, BCSL-147, BCSL-159, BCSL-135, BCSL-159	a) Continuous Evaluation: Max.Marks:50,Min.Marks:20,Weightage:25% b) Term End Practical Examination: Max. Marks: 50, Min. Marks 20, Weightage: 75%, Duration of TEPE: 2 hour
BCSL-013	(a) Continuous Evaluation: Max. Marks:100,Min.Marks:40,Weightage:25% Term End Practical Examination: Max.Marks:50,Min.Marks20,Weightage:75% Duration of TEPE: 2 hour
BCS-040	(a) Continuous Evaluation: Max. Marks:100, Min.Marks:35Weightage:25% (b) Term End Examination: Max. Marks: 50, Min. Marks 17.5, Weightage: 75% Duration of TEE: 2 hours
BCS-042 , BCS-053	(a) Continuous Evaluation: Max. Marks:100, Min.Marks:40Weightage:25% (b) Term End Examination: Max. Marks: 50, Min. Marks 20, Weightage: 75% Duration of TEE: 2 hours
FEG-02	a) Continuous Evaluation: Max.Marks100,Min. Marks:35,Weightage: 30% b) Term End Examination: Max.Marks:50,Min.Marks:17.5,Weightage:70%, Duration of TEE: 2 hours
BCSP-165	(a) Project Report Evaluation: Max.Marks:150, Min.Marks:60,Weightage:75% (b) Project Viva: Max.Marks:50, Min.Marks:20,Weightage:25% The minimum passing marks in each of the project report evaluation and viva-voce are 40%
BECS-184	Continuous Assessment (CA) 30% Term End Examination (TEE) 70%
MCS-201 MCS-202 MCS-203 MCSL-204 MCSL-205 MCS-206 MCS-207 MCS-208 MCSL-209	Continuous Assessment (CA) 30% Term End Examination (TEE) 70%
BEVAE-181 BEGLA- 136 BCOC-131 BCOS-184 BCOS-185	Continuous Assessment (CA) 30% Term End Examination (TEE) 70%
MSEI-023 MSEI-027	Continuous Assessment (CA) 10% Term End Theory Examination (TEE) 30% Term End Practical Examination(TEPE) 60% A student needs to secure at least 50% marks in continuous assessment and term end examination (Theory and Practical) Separately in a course to be declared successful in that particular course. This requirement in applicable for all the courses of MSCIS.

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**(total 20 marks)

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)
MCSL-204	Section-1(20) Section-2(20)	Section-1(20) Section-2(20)	20	100
MCSL-205	Section-1(20) Section-2(20)	Section-1(20) Section-2(20)	20	100
MCSL-209	Section-1(40)	Section-1(40)	20	100

Course Code	Course Title	Credits	Continuous Evaluation		Term End Examination Theory OR Practicals*(for Lab courses only) (Weightage-75%)		
			Assignment (Weightage – 25%)		Duration	Max. Marks	Min. Marks
			Max. Marks	Min. Marks			
BCSL-013	Computer Basics and PC Software	2	100	40	2	100	40
BCSL-135	DBMS and C++ Lab	2	100	40	2	50	20
BCSL-146	Object Oriented Programming using Java Lab	2	100	40	2	50	20
BCSL-147	Web Programming Lab	2	100	40	2	50	20
BCSL-159	Introduction to Algorithm Design Lab	2	100	40	2	50	20
MSEI-023(P)	Cyber Security	4*	100	50	3	100	50
MSEI-027(P)	Digital Forensics	4*	100	50	3	100	50

* - These courses include Term End Theory Examination (TEE) & Term End Practical Examination(TEPE) both.

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

The term-end examination of the practical courses consists of several sections. Each section will be evaluated separately. The viva-voce for each section will also be separate. The following table shows the details:

(Practical questions–80%andViva-voce–20%)

Course Code	Duration of term-end practical exam.(Each Section gets equal time)	Term-end practical examination and viva-voce	
		Marks Section-1	Marks Section-2
MCSL-204 (2credits)	2hours	20(P)+5(V) =25marks	20(P)+5(V) =25marks
MCSL-205 (2credits)	2 hours	20(P)+5(V) =25marks	20(P)+5(V) =25marks
MCSL-209 (2credits)	2hours	40(P)+10(V) = 50marks	

P-problems given in the exam paper, V–viva-voce for that section.

A student needs to obtain a minimum of 40% in **each section** of the term-end practical examination for successful completion of that particular section. In case a student does not secure the minimum passing marks in a section, s/he needs to appear for the term-end practical examination again for that section only.

SCHEME OF ASSESSMENT OF STUDENT’S PERFORMANCE

The total numbers of courses in BCA Programme are 32 and the total number of Credits are 120

Evaluation for each course covers two aspects:

- (1) Term-End Examination (TEE: Theory & Practical)
 - a. Weightage of 75%: BCS-012, BCS-111, BCS-131, BCS-040, BCS 053, BCS-041, BCS-151, BCS-042, BCSL-135, BCSL-146, BCSL-147, BCSL-013, BCSL-159.
 - b. Weightage of 70%: All remaining courses, except for MSEI-023 and MSEI-027, which have theory and practical examination both.
- (2) Continuous evaluation through Assignment
 - a. Weightage of 25%: BCS-012, BCS-111, BCS-131, BCS-040, BCS 053, BCS-041, BCS-151, BCS-042, BCSL-135, BCSL-146, BCSL-147, BCSL-013, BCSL-159.
 - b. Weightage of 30%: All remaining courses, except for MSEI-023 and MSEI-027, which have theory and practical examination both.
- (3) Project course BCSP-165 consists of 2 Compulsory evaluation components: Project Report and Viva-Voce.
- (4) Completion of the BCA_NEW / BCA_NEW programme requires successful completion of all the components of each course i.e. Assignment, Term-End Examination, Project report, Viva-Voce and Practical’s, separately, as per the following criteria:
 - a. The minimum marks are 40% in Continuous Evaluation through Assignments, except BEGLA 136, BEVAE 181, FEG 02, BCS 040, BCOC 131, BCOS 184, BECS 184, BCOS 185; where the minimum marks are 35%. Further, the minimum marks are 50% in Continuous Evaluation through Assignments for the courses MSEI-023 and MSEI-027.
 - b. The minimum marks are 40% in Term End Examination (Theory / Practical), except BEGLA 136, BEVAE 181, FEG 02, BCS 040, BCOC 131, BCOS 184, BECS 184, BCOS 185; where the minimum marks are 35%. Further, the minimum marks are 50% in Term End Examination (Theory & Practical both), for the courses MSEI-023 and MSEI-027.
 - c. The minimum marks required to successfully complete BCSP 165 : 40% in project report and 40% in viva voce

- (5) On successful completion of the components of all the course i.e. Assignment, Term-End Examination, Project report, Viva-Voce and Practical's, separately, A Student should be awarded BCA_NEW/BCA_NEW graduation marksheet/degree.

However, A student may exercise the Multiple Exit Scheme, offered by the University, the options are:

- a. Exit Option-1: On successful completion of 1st year of BCA_NEW/BCA_NEW programme (i.e. 1st and 2nd semester), Undergraduate certificate in Computer Applications should be awarded.
- b. Exit Option-2: On successful completion of 1st& 2nd year of BCA_NEW/BCA_NEW programme (i.e. 1st to 4th semester), Undergraduate Diploma in Computer Applications should be awarded.

Course Code	Total Number of Section(s)	Maximum Marks Breakdown
BCSL-013	01	Each Section 80 Marks for Practical Question + 20 Marks for Viva
MCSL-204	02	Each Section 20 Marks for Practical Question + 5 Marks for Viva
MCSL-205	02	Each Section 20 Marks for Practical Question + 5 Marks for Viva
MCSL-209	01	Each Section 40 Marks for Practical Question + 10 Marks for Viva
BCSL-135	02	Each Section 20 Marks for Practical Question + 5 Marks for Viva
BCSL-146	01	Each Section 40 Marks for Practical Question + 10 Marks for Viva
BCSL-147	01	Each Section 40 Marks for Practical Question + 10 Marks for Viva
BCSL-159	01	Each Section 40 Marks for Practical Question + 10 Marks for Viva

Award of Final Division:

The final division of a student is awarded as follows:

Marks Range	Division
75% and above	First Division with Distinction
60% or more but less than 75%	First Division
50% or more but less than 60%	Second Division
40% or more but less than 50%	Third Division

5.2 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 minimum 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) use of figure/ diagram to enhance your answer wherever required;
- e) does not exceed the number of words indicated (if any) in your questions.

iii) 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:.....
LSC:.....	DATE:.....

- 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 LSC. Under no circumstances should they be sent to any other department or the School at Headquarters, for evaluation. After submitting the assignment at the LSC 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 LSCs 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 LSC, s/he should submit her/his Assignments only to the original LSC until the University effects the change of LSC.

5.3 Guidelines for the Submission of Assignments

1. Visit your Regional Center website for latest update about Assignment Submission.
2. 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.
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 Co-ordinator of the LSC 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. In case of submitting assignment through post, Students should enclose a self-addressed stamped assignment remittance-cum-acknowledgement card 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 student, which may be downloaded from IGNOU website.
7. For their own record, students should retain a photocopy of all the assignment responses, which they submit to the Co-ordinator of their LSC. If they do not get back their duly Evaluated Assignment within a month after submission, they should try to get it from their LSC 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 LSC, so that s/he forwards the correct score to the concerned RC or to the Student Evaluation Division at 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, Student Evaluation 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.
11. In case of not successfully completed or missed; the fresh assignments should be submitted only, if your registration for that course is valid.

12. Please do not submit your assignment responses twice either at the same LSC or at different LSCs for evaluation.

Note: Please submit your Assignments on or before the due date at your LSC.

5.4 General Guidelines Regarding the Term-End Examination (it is also available at IGNOU website)

1. The examination form can be submitted online only. The fees and the guidelines are given below:
2. To be eligible to appear the Term-end Examination in any course, the students are required to fulfill 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 through online with credit/debit/net banking 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.
3. 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.
4. (i) **Dates for the Submission of Online Term End Examination form**

Please see the updated details at: <http://www.ignou.ac.in>

(ii) Examination fee and Mode of Payment

Examination Fee	Payment Mode
@ Rs. 200/- per course theory	Online mode through Credit Card / Debit Card /Net Banking
@ Rs. 200/- per course practical/lab	

In case, examination fee needs to be returned to student due to technical reasons, the fee will be refunded to the same account (Credit card/ Debit card/ Net Banking) from which the payment was made.

Students are advised that they must ensure they are exercising adequate caution and care while filling the form and opting mode of payment.

(iii) Un-successful Submission of Exam Form

Step 1: Payment deducted through Credit Card / Debit Card /Net Banking, however the student is not able to get acknowledgement successfully. The student is required to approach the bank to take the charge back.

Step 2: Re-submit the Examination Form on or before the last date of submission of exam form is over. (Step1).

Step 3: Students can apply separately after the publication of Hall Ticket on IGNOU website for the refund of Examination Fee, if not refunded automatically by the Payment Gateway within 72 hours to email ID :termendexam@ignou.ac.in.

(v) Related to Refund excess Examination Fee

- a. Students who fill Exam Form online through Cyber Caf[©]/ Other Agency, must ensure receipt of the Examination Fee and that their Fee is reached IGNOU through SEARCH Option at IGNOU website
- b. The result shall be withheld/cancelled for the students who have taken back the examination fee through charge back process from the concerned bank and appeared in the examination illegally.
- c. The excess/unsuccessful fee amount will be adjusted/refunded as the case may be, to the account from which the payment was made after due verification of records of the concerned Bank.

(vi) Hall Ticket for Term End Examination

- Hall Ticket **for the eligible students** will be uploaded on the University Website (www.ignou.ac.in) approximately 7 to 8 days before the commencement of the Term-end examinations. Please take print out of Hall Ticket from University website (www.ignou.ac.in) and report at the Examination Centre along with the Identity Card issued by the Regional Centre/University.
- Students will be allowed to appear in Term-end Examination for the course(s) for which registration is valid and not time-barred and assignment(s) is/are submitted.
- Students must carry IGNOU Identity-Card in the Examination Hall for writing Examination. In case, students do not have IGNOU Identity card due to various reasons, they must get it issued (i.e. duplicate copy of IGNOU Identity card) from Regional Centre concerned well before the start of the Examination. Students are required to contact the RC in person (by post) and get the duplicate Identity card for attending Examination.
- Examination Fee once paid will not be refunded.

(vii) Contact Details

In case of non-receipt of Control number or any query pertaining to Examination Form please contact or send email at: termendexam@ignou.ac.in

Please visit IGNOU website for updated information related to Term End Examination

5.5 Guidelines and instructions for submission of online examination form at IGNOU website.

- i) Students are required to pay examination **fee for each 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, & Net banking through online mode. Please choose the suitable option for payment. For details of fee, please refer to examination form.
- ii) The examination form must submitted through online mode at IGNOU website www.ignou.ac.in

- 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 drop down menu.
- v) You have to submit on-line form and make payment through Credit Card & Net banking. Please note the auto generated control No. for further reference.

Date of Submission of Examination Forms & Fees

The Examination fees per course is @ ₹ 200/- per course (Theory/Practical/Lab). The dates are prone to change. Please check <http://www.ignou.ac.in> for latest dates & schedule at IGNOU website.

5. Please see the instructions under headline Instructions for submission of Examination forms.
6. Students should carry their **Identity Card and Hall Ticket** (download hall ticket from IGNOU website indicating Centre & Date of Examination) to the Examination Centre.
7. In case a student fails to receive the Hall ticket, may please contact to SED at email ID [:termendexam@ignou.ac.in](mailto:termendexam@ignou.ac.in)
8. The students will be entitled to appear for the examination only at the examination centre allotted to them and **NOT** at any other centre without specific permission from the University. **The Examination Centre once allotted shall not be changed.**
9. 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. 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.
10. The students can get their Term-end Examination result reevaluated. They should apply in prescribed form. A prescribed fee for reevaluation is charged per course. This amount is refunded if there is a mistake in checking of answer-book.
11. Duplicate Grade Card/marks sheet will be issued on a request from the students in prescribed form against payment of prescribed charge/fee by Demand Draft drawn on IGNOU, New Delhi.
12. 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.
13. **Obtaining Photocopy of Answer Scripts**
After the declaration of result, if the students are not satisfied with the marks awarded, they

can request the University for Photocopy of Answer Scripts on payment of prescribed fee per course. The request for obtaining Photocopy of Answer Scripts by the student must be made within 45 days from the date of declaration of result to the Evaluation Centre concerned in the prescribed format along with the prescribed fee - per course in the form of Demand Draft in favour of IGNOU payable at the city where submitting the request for Photocopy. Format is available in the Programme Guide or IGNOU website: www.ignou.ac.in

14. **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 prescribed fee 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.

15. **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 prescribed fee 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.

16. **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 prescribed fee 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, Physically Handicapped, OBC (Non-Creamy Layer), and Economically Weaker Sections 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 performa 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 LSC

Counselling facilities are not available for all the programmes at all the LSCs. As such, students are advised to make sure that counselling facilities are available, for the subject they have chosen, at the new centre opted for. Request for change of LSC 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 an NOC from the Regional Center where they are willing to get themselves transferred in view of the practical sessions involved in BCA_NEW.

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 LSC 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 LSC.

6.5 Procurement of Official Transcripts

The University provides the facility of obtaining official transcripts on request, made by the students on plain paper addressed to the Registrar, Student Evaluation Division (SED), Block 12, IGNOU, Maidan Garhi, New Delhi-110068. A prescribed fee is charged for this purpose.

6.6 Duplicate Grade Card

The student can apply for obtaining duplicate Grade Card in case the same has been lost/misplaced/damaged, by making a request in prescribed format along with prescribed fee in the form of DD drawn in favour of IGNOU payable at New Delhi. Format is available in the Programme Guide or IGNOU website: www.ignou.ac.in. The request may be made to the Registrar, Student Evaluation Division, IGNOU, Maidan Garhi, New Delhi-110068

6.7 Study Materials for Your Programme of Study

- [1] After confirmation of admission, study materials are dispatched to the student's registered address by speed/ registered post.
- [2] Keep checking status of dispatch of study materials on the IGNOU website using the weblink, www.ignou.ac.in/ignou/aboutignou/division/mpdd/material, provided by MPDD.
- [3] If you received Study Material then visit Student Support Centre (LSC) concerned with ID card for schedule of classes/lab
- [4] If you not received Study Material then visit Regional Centre concerned only or write to mpdd@ignou.ac.in

6.8 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.

Term End Examination Form and other forms can be downloaded from <http://www.ignou.ac.in>

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 LSCs 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 (SRD), Email: registrarsrd@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), Phone No. 011-29572204/2205(SED), FAX No.011-29534429 068
iii)	Study Material and Assignments, Admission, Fees, Scholarship, Change of Course/Programme, Change of Address, LSC/ Regional Centre, Issue 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_NEW Programme Coordinator SOCIS, C-Block, New Academic Complex IGNOU, Maidan Garhi, New Delhi - 110 068 Phone No. 011-29572902, Email: BCA@ignou.ac.in
v)	Administrative and counseling matters, missing score of Project assignments theory and practical assignments, Assessment Sheets	Co-coordinator of your LSC/Regional Director of the Regional Centre concerned
vi)	Issue of Degree/Diploma/Certificate, Dispatch 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 exam1@ignou.ac.in
vii)	Issue of Provisional Certificates and Grade Cards	Dy Registrar (Exam-3) Phone No: 011-29536743; Intercom No. 2201
viii)	Declaration of pending results of TEE, Incorporation of practical marks, Verification of provisional certificate and grade card, Issue of transcripts	Dy. Registrar (Exam-3) Phone No: 011-29536103/6743 011-29572201/2211
ix)	Non incorporation of assignment marks	Assistant Registrar (Assignment) Phone No: 011-29532294 Intercom No. 1319/1325 E-mail: assignments@ignou.ac.in
(x)	Online students grievances Portal	http://igram.ignou.ac.in/
viii)	Students General Enquiries	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

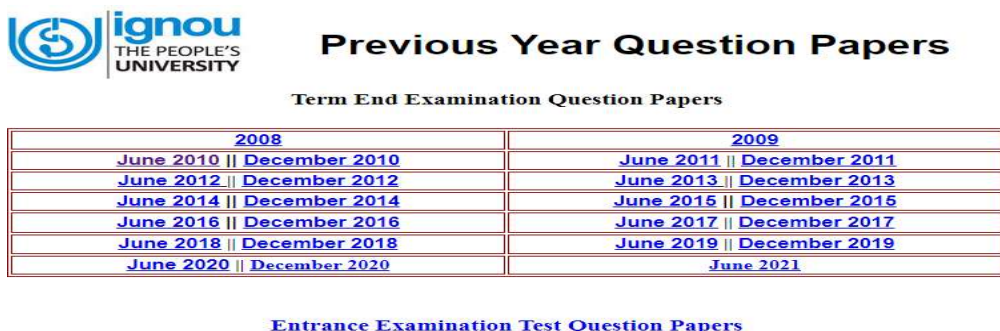
Telephone numbers of the Divisions/ Schools are also provided on the website under the “Contact Us” option. Students are advised to be in touch with their LSCs for advance/timely/day- to-day information or visit the website with URL : <http://www.ignou.ac.in>

8 LINK TO OLD QUESTION PAPERS

For your reference, old question papers of most of the programmes offered by the University are available at IGNOU Website. If you want to download the previous year’s question papers (if applicable), 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: <http://www.ignou.ac.in>

The following is the process of downloading the question papers from IGNOU website:

Visit the IGNOU website at URL: <http://www.ignou.ac.in> and select the Download Button on IGNOU web site. On this Download Page select Question Papers link. The following page will be displayed (please note that URL of this page is: <https://webservices.ignou.ac.in/Pre-Question/>)



2008		2009	
June 2010 December 2010		June 2011 December 2011	
June 2012 December 2012		June 2013 December 2013	
June 2014 December 2014		June 2015 December 2015	
June 2016 December 2016		June 2017 December 2017	
June 2018 December 2018		June 2019 December 2019	
June 2020 December 2020		June 2021	

[Entrance Examination Test Question Papers](#)

Figure : The Previous Year Question Papers of IGNOU

Select the year of Question paper, this will display School wise list of Question papers, as the list is large you may use find on page option of your browser to find old question papers of respective course.

9 LINK TO FORMS AND ENCLOSURES

In this section, we are enclosing the IGNOU website links to various forms, which are useful for you. Whenever you have to correspond with the university, please download the form from the Website and fill it carefully and send as per instructions therein. The detailed instructions for all these-forms are provided in form itself. Some of these links may change, in those cases please use

Note: You must Download the Forms from the Website

search option to find the desired link.

Forms and Useful links

- Change of Address (Form No. 1)
- Assignments Remittance-Cum-Acknowledgement Card (Form No.2)
- Link to Latest Assignment(s)
- Link to Online Re-Registration for BCA_NEW Programme
- Link to Online Term end Examination form
- Link to form for early declaration of result
- Link to form for obtaining photocopy of the answer script
- Link to form for Re-evaluation of Answer script
- Link to Application form for improvement in Division/Class
- Link to form for obtaining Duplicate Grade Card / Mark-sheet
- Link to form for issue of Official Transcript
- Link to form for issue of Migration Certificate

Assignments related links

Assignment Remittance-cum-Acknowledgement (Form 2)

(It is attached on page No. 76)

Link to Latest Assignment(s) https://webservices.ignou.ac.in/assignments/Bachelor-Degree/BCA/BCA_NEW/bca_new.html

Re-registration

Link to Online Re-Registration for BCA_NEW Programme

<https://onlinerr.ignou.ac.in/>

Last date of Re-Registration is announced on the IGNOU website. In general, the re-registration is to be done 2-3 months prior to the start of session.

Term end Examination and related links

- Link to Term End Examination form: <https://exam.ignou.ac.in/>
- Link to form for Early Declaration of Result
<https://termendresult.ignou.ac.in/login.aspx>
- Link to Application Form for Obtaining Photocopy of the Answer Script
<https://ignou.samarth.edu.in/index.php/site/login>
- Link to form for Re-evaluation of Answer script
<https://onlineservices.ignou.ac.in/REEVALUATION/>
- Link to Application form for Improvement of Division/Class
<https://www.ignouhelp.in/wp-content/uploads/2021/08/IGNOU-Improvement-Exam-Form.pdf>
- Link to form for Duplicate Grade Card/Mark-sheet
<https://www.ignouhelp.in/wp-content/uploads/2021/08/IGNOU-Improvement-Exam-Form.pdf>
- Link to form for Issue of Official Transcript
<https://ihmctan.edu/images/pdf/Application-Form-for-IGNOU-Official-Transcript.pdf>
- Link to form for Issue of Migration Certificate
<http://rcbhubaneshwar.ignou.ac.in/ignou-RC-Bhubaneshwar/userfiles/file/Issue%20of%20Migration%20Certificate.pdf>



FormNo.1

(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 Regional Director
IGNOU Regional Centre

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

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

**ASSIGNMENTS REMITTANCE -CUM-
ACKNOWLEDGEMENT CARD**

Enrol No. _____ Programme Title: _____ Name: _____ Course Code: _____ Medium: _____		INDIRA GANDHI NATIONAL OPEN UNIVERSITY ASSIGNMENTS REMITTANCE -CUM-ACKNOWLEDGEMENT CARD																												
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		Date of Receipt: _____																												
		Name of Evaluator: _____																												
S.No.	Assignment No.	For Office Use Only																												
		S.No. _____																												
		Signature of the receiver _____																												
		Date : _____																												
Signature of the Student Date : _____		Signature of the Student Seal Name : _____ Address of the Student : _____ Date : _____ (Please write your complete address and affix adequate postal stamp on reverse)																												

Affix
Stamp
Here

From:

The Coordinator
LSC concerned

To

(ADDRESS OF THE STUDENT)

.....



ज्ञान-विद्यान विभुक्तये

प्रो. रजनीश जैन
सचिव

Prof. Rajnish Jain
Secretary



सत्यमेव जयते

विश्वविद्यालय अनुदान आयोग
University Grants Commission

(शिक्षा मंत्रालय, भारत सरकार)
(Ministry of Education, Govt. of India)

बहादुरशाह जफर मार्ग, नई दिल्ली-110002
Bahadur Shoh Zafar Marg, New Delhi-110002

Ph.: 011-23236288/23239337

Fax: 011-2323 8858

E-mail: secy.ugc@nic.in

F. No.3-5/2022(DEB-III)

PUBLIC NOTICE

August, 2022

02 SEP 2022

Equivalence of degree obtained through ODL and Online mode with degree obtained through conventional mode

The Regulation 22 of the University Grants Commission (Open and Distance Learning Programmes and Online Programmes) Regulations, 2020 stipulates as under;

"Equivalence of qualification acquired through Conventional or Open and Distance Learning and Online modes.— Degrees at undergraduate and postgraduate level in conformity with UGC notification on Specification of Degrees, 2014 and post graduate diplomas awarded through Open and Distance Learning mode and/or Online mode by Higher Educational Institutions, recognised by the Commission under these regulations, shall be treated as equivalent to the corresponding awards of the Degrees at undergraduate and postgraduate level and post graduate diplomas offered through conventional mode."

This is for information of the general public, students and other stakeholders.


(Rajnish Jain)

QR Codes for some of the useful Web Links



eGyankosh
(for Online Course Materials)



Online Re-Registration Form



iGRAM
(IGNOUGrievance Redressal and Management)



Old Question Papers

Note: The above QR Codes can be scanned and open through QR Code Scanner.