

Programme Guide

Bachelor of Computer Application (BCA)



Krishna Kanta Handiqui State Open University

The University deserves the right to change the rules and procedures described in this Programme Guide. Please check from time to time with the University Website for updates.

Recognition of Degrees/Diplomas/Certificates provided by Krishna Kanta Handiqui State Open University:

- Established under the provision of the 'Krishna Kanta Handiqui State Open University Act' 2005 of the State Legislature of Assam.
- The University has been recognised and its academic programmes have been approved by the UGC, New Delhi vide letter no. F.9-13/2008(CPP-I), dated March 18, 2009.
- The Government of Assam has recognised all degree, diploma and certificate programmes of the University for job and higher study vide letter no. AHE/228/2007/330, dated May 08, 2009.
- The UGC through its Public Notice vide F. No. 1-9 2018 (DEB-I) dated 23rd February, 2018 has asked for recognising and treating the Degrees/Diplomas/Certificates awarded through distance mode at par with the corresponding awards of Degrees/Diplomas/Certificates obtained through the formal system of education. URL: https://www.ugc.ac.in/pdfnews/5628873_UGC-Public-Notice---treating-all-degrees.pdf

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1. MESSAGE FROM THE DEAN (ACADEMIC)

Dear Learner,

Greetings from the Establishment of the Dean (Academic) at Krishna Kanta Handiqui State Open University.

I heartily welcome you as a learner of the BCA Programme of this prestigious state open university and I hope that you will be happy to explore the varied and up-to-date curriculum of this Programme which are compatible with the 21st century employment market. KKHSOU has been a choice-based educational destination for many who were deprived or denied or conditionally forced to remain away from their dream of education. While imparting need-based education to the fresh learners, our University also holds the promise of fulfilling the educational dreams of the socially backward, underprivileged and marginalised people of our society.

Friend, I am happy to inform you that we at KKHSOU provide diverse tracks to fulfil your learning needs. Our university is currently offering programmes in four different levels i.e. Master's Degree, Bachelors' Degree, Diploma and Certificates under six different Schools of Studies namely, S. K. Bhuyan School of Social Sciences, Padmanath Gohain Baruah School of Humanities, Maniram Dewan School of Management, Bhupen Hazaiika School of Mass Communication, Guru Prasad Das School of Vocational Studies and Hiranya Chandra Bhuyan School of Science and Technology. We are having subjects right from Literature to Journalism, from Yoga to Commerce and Management. Once a learner is awarded a Degree or Certificate by KKHSOU in any of the programmes, he/she becomes eligible for employment in any government or private sector work market. Therefore, start your educational journey with confidence and hard work so that you can shine in life.

I am happy to share the fact that we are loved and embraced by a large number of learners spread across the state and beyond. During your journey in our university, you will be supported by a host of Learner Support Services about which you learn in this Programme Guide. Therefore, I urge you to make full utilisation of the resources and facilities provided by our university. Besides, our faculty members shall be always ready to assist you in advancing your knowledge, developing your creativity and discovering solutions to the pressing academic questions you might face.

I know that we have challenges to meet. However, I also assure you that through our dedication, determination and teamwork, we shall be able to overcome all problems on our way.

I wish you all the very best for your bright future.

**Dean Academic
KKHSOU**

2. STUDYING AT KKHSOU USING THE DISTANCE LEARNING MODE

Krishna Kanta Handiqui State Open University (KKHSOU) welcomes you to its vast community of aspiring learners. It is important to advance and upgrade your education for a productive and healthy living in contemporary society. Hence, it is important that you choose the right university to suit your learning needs. KKHSOU shall assist you in all the aspects of your educational journey.

You will note that KKHSOU is the 14th State Open University of India with a learner-base of 3,00,000 until 2019. This University has adopted the Open and Distance Learning (ODL) mode to facilitate the implementation of its different academic programmes with a view to providing timely opportunities for lifelong learning. Our flexible academic programmes shall suit the needs of all our learners as well as working individuals who are unable to study full time on-campus five-six days a week, despite having a desire for an accredited qualification and personal development.

While studying at KKHSOU, you will be supported by a meticulously prepared Self-Learning Materials (or SLMs) that are well designed and expertly written; an all-inclusive university website; an e-SLM portal and a host of other learner support services such as face-to-face counselling sessions in the University Study Centres, which act as the mirror of the University.

The SLMs in a particular programme are specially prepared by a group of experts who include the faculty members from KKHSOU as well as those drawn from different Universities and educational institutions located across the state as well as the country. The preparation and production of the SLMs of a particular department are co-ordinated by the faculty members of the concerned department following a careful scrutiny of the contents and language by experts in the field. Besides, efforts to make audio and audio-visual contents based on the syllabus are also made in the Multimedia Production Unit of the University in consultation with the course writers, editors and in-house faculty members. Such audio-visual materials are reviewed by the faculty members, media experts and the concerned authority, before they are uploaded in the University's YouTube page.

We hope that you will make full use of the resources provided by the University during your academic journey. However, you should also know that your achievement in the programme of enrolment will also depend on your performance in both the continuous assessments through assignment and the Semester-end examination. Studying in an ODL Institution for an award of degree or qualification demands great commitment on your part as a learner. Although KKHSOU provides you with a flexible way of learning, you are required to complete all the assignments in due course within a stipulated period and take the examinations according to the schedule specified. In general, besides attending the face-to-face counselling sessions and tutorials at your study centre where you have enrolled, you should be able to allocate at least 2-3 hours a day for studying your courses.

With this introductory information, you should start your programme at KKHSOU and we hope that by availing all the support services of the university, you will succeed in your educational venture. We assure you that the University fraternity shall always stand by you to help you with all your academic requirements.

3. HOW TO SUCCEED AS A DISTANCE LEARNER IN THE ODL SYSTEM

The Open and Distance Learning (or ODL) is a system of education in which education is imparted to the learners from a distance. The two basic elements in ODL are:

- a. The physical distance between the educators and the learners;
- b. The changed role of the educators who meets the learners only for selected tasks such as counselling during contact sessions, conducting tutorials and helping the learners with field-based projects and collaborating with the learners to solve their problems.

In the conventional face-to-face mode of education, the teaching-learning contents are communicated directly by the teachers/educator mainly through the lecture method. In distance education however, this interpersonal communication is replaced by print, telephonic and electronic communication, broadcasting of educational programmes, online communication and others need-based methods. Hence, the philosophy of ODL is based on the idea of the 'teacher in print' that means the teachers are very much present in the SLMs, directly teaching each learner through printed words.

In your case, the benefit of ODL is that it provides access to education that you would not have gained otherwise. ODL allows you to study when and where it suits you and enables you to continue learning while also fulfilling your commitments to the family, work and community. You may be pursuing higher education for various reasons such as—you might be interested in changing your career or you might simply want to expand your knowledge base for personal enrichment. Whatever may be the reason, unlike in the conventional system, ODL provides you with flexitime learning experience while catering to your learning needs. It is important for you to bear in mind that in ODL, you are not pursuing your studies alone on your journey.

We encourage you to make full use of the facilities provided by the University during your study at KKHSOU. You should always make an attempt to regularly attend the counselling sessions at the study centre where you have enrolled, form study groups with your programme-mates, check for the latest academic updates in the University website: www.kkhsou.in, participate in academic discussion with your fellow learners as well as your teachers through Facebook or WhatsApp groups, contact your tutors at the study centres or the teachers at the University headquarters. Further, your tutors in the study centers shall be there to help you understand the course materials, clarify the concepts you find difficult and collaborate with you to enhance your learning experience.

Feel free to learn and enjoy learning towards successful completion of the Programme.

4. INTRODUCING THE BCA PROGRAMME

Bachelor of Computer Application (BCA) is a three-year degree programme under semester system in which learners will be exposed to various areas of computer applications including the latest developments in Information Technology (IT).

The programme is designed for the learners who have completed 10+2 and are interested in taking IT as a career. This programme comprises 23 courses which includes practical and project work. There are six semesters in this programme. There are four courses each from

first semester to fifth semester (with options in 5th Semester). The sixth semester consists of two courses and project work.

4.1 Aims of the Programme:

The BCA Programme aims at

- a. Generating an interest in computer programming
- b. Helping learners think logically using programming skills in their day to day life
- c. Developing the learners to become skilled IT professional
- d. Developing human resources who might join the teaching fraternity

4.2 Objectives of the Programme:

The main objectives of the BCA programme are as follows:

- To produce skilled IT human resources.
- To enhance knowledge and basic computer skills of learners.
- To promote computer literacy among learners.
- To provide better job prospects for computer science graduates.

4.3 Target Group:

The BCA Programme has been designed for

- a. Learners who have an interest in pursuing higher education in Computer Applications through the ODL mode.
- b. Learners who have passed 10+2 level and would want to enrol themselves for higher education through ODL mode for any reasons.
- c. Learners who are interested in their own entrepreneurship ventures using computer background like developing
- d. In-service persons who would benefit from this programme in terms of career progression.

4.4 Duration:

The minimum duration of the BCA Programme is three years. Learners are allowed to take a maximum of eight years which means that the learners will get an additional five years along with their year of enrolment to complete this Programme. This is possible mainly because the mandate of KKHSOU is to provide 'flexitime' learning opportunity to all learners.

4.5 Career Prospects:

After successfully completing the BCA Programme, learners will be able to:

- enrol for Post Graduate degree/diploma programme like MCA/MScIT/PGDCA
- pursue a career in IT industry
- set up own IT firms as business ventures
- join Govt. Sectors job that require IT skills

4.6 Study Hours:

The BCA Programme consists of 22 papers/courses and a project work. Each of the courses carries 4 credits and the project carries 8 credits which makes the total credit of the programme 96. In the ODL system, a credit is often the measure of workload in terms of a

student's learning efforts. One credit is equivalent to 30 study hours. Usually, a credit is calculated on the basis of the time spent for studying and doing practical works. Thus, a credit collectively refers to different aspects of study, such as

- Studying the SLMs
- Working on the assignments
- Performing laboratory works practical courses
- Investing time for research and development of project work
- Devoting time in studying materials mentioned in Further Reading section of SLMs
- Listening and watching audio and audio-visual programmes
- Attending academic counselling sessions at the respective study centres and so on.

In one course comprising 4 credits, the learners will need to devote about 120 hours to finish the course contents. However, as the 'flexi-time' option is available, learners may themselves decide on the time to be devoted to the Programme. However, if the learner devotes around 2-3 hours of meaningful and effective study every day, he/she will comfortably complete the programme in three years.

5. PROGRAMME STRUCTURE:

The BCA Programme comprises 6 Semesters with a total of 22 courses/papers and a project work. Each course will carry 100 marks out of which 20 marks in a course (without practical) or 10 marks (with practical) will be reserved for Home Assignments.

The following are the Semester wise courses of the BCA Programme:

Semester	Title of the Courses	Brief Description	Recommended Readings
Semester 1	BCA(S1)01: Computer Fundamentals	This course has been prepared for the beginners as well as advanced learners to provide an introductory knowledge of computer fundamentals. It discusses the structure and functioning of various components of a computer system. It also discusses characteristics, evolution, applications of computer.	<ul style="list-style-type: none"> • Goel, A. (2010). <i>Computer fundamentals</i>. Pearson Education India. • Rajaraman, V., & Adabala, N. (2014). <i>Fundamentals of computers</i>. PHI Learning Pvt. Ltd. • Sinha, P. K., & Sinha, P. (2010). <i>Computer Fundamentals</i> (Vol. 4). BPB publications.
	BCA(S1)02: PC Software	This course mainly concern about the operating system and MS office. It describes fundamental concept of different operating systems like DOS, UNIX, Linux, MS-Windows.	<ul style="list-style-type: none"> • Gookin, D. (2011). <i>DOS for Dummies</i>. John Wiley & Sons. • Craig, <i>Teach Yourself Linux in 24 Hours</i>, BPB Publication • Witherspoon, C, <i>Red Hat Linux 6 Fast & Easy</i>, BPB Publication • Siechert, C., & Bott, E. (2010), <i>Microsoft® Office 2010 Inside Out</i>, Microsoft Press.
	BCA(S1)03: Digital Techniques	This course gives an overview of digital representations used in computer system. It also discusses important concepts like reduction techniques, sequential and combinational circuits, registers and counters.	<ul style="list-style-type: none"> • Ram, B. (2000). <i>Computer Fundamentals: Architecture and Organization</i>. NewAge International. • IT Education Solutions Limited, & Sargunar, J. (2011). <i>Introduction to Computer Science</i>. Pearson Education India. • Mano, M. M. (2017). <i>Digital logic and computer design</i>. Pearson Education India. • Sinha, P. K., & Sinha, P. (2010). <i>Computer Fundamentals</i> (Vol. 4). BPB publications.
	BCA(S1)04: Computer Programming Using C	This course gives an introduction to computer programming. It deals with the fundamental concept of C programming language including pseudo code, algorithm and flowcharts. Various data types, operators,	<ul style="list-style-type: none"> • Gottfried Byron, S; <i>Programming with C</i>; Tata McGraw-Hill Education. • Balagurusamy, E. (2002); <i>Programming in ANSI C</i>; Tata McGraw-Hill Education.

		expressions, conditional and branching statements are explained in this course. It also discusses important concepts of programming language like function, array, pointers etc. and file handling concept.	<ul style="list-style-type: none"> • Thareja, R. (2012); <i>Computer Fundamentals & Programming in C</i>; OXFORD University Press.
Semester 2	BCA(S2)01: Discrete Mathematics	This course is on discrete mathematics and it deals with the fundamentals concept like sets, relation and functions along with permutation and combination. It also describes basic algebraic structures including group, ring, integral domain etc. and some important concepts.	<ul style="list-style-type: none"> • Rao, B., <i>Discrete Structure and Graph Theory</i>. SciTech Publications (India) Pvt Lt. • Lipschutz, S., & Lipson, M. (1997). <i>Discrete Mathematics</i>, Schaum's outlines. • Khanna, V. K., & Bhamri, S. K. (1998). <i>A course in abstract algebra</i>. Vikas Publishing House. • Satyanarayana, B., & Prasad, K. S. (2014). <i>Discrete Mathematics and Graph Theory</i>. PHI Learning Pvt. Ltd.
	BCA(S2)02: Computer Based Accounting and Financial Management	This course provides a firm foundation in basic accounting covering financial accounting, cost accounting and management accounting.	<ul style="list-style-type: none"> • Bhattacharya, A., <i>Financial Accounting</i>, Prentice hall of India Pvt. Ltd, New Delhi. • Maheshwari, S. N., <i>Financial Accounting</i>, Vikash Publishing House Pvt. LTd., New Delhi.
	BCA(S2)03: Data Structure Through C Language	This course is an introduction to most of the basic and advanced data structures, and their implementation with the C language. It is designed for beginners who would like to learn the course through programs. Data structures are essential to perform different functions on the data and to retrieve data in an efficient way. This course includes the concept of array, linked list, stack, queue data structures and the different operations that can be performed on these data structures. The concepts of searching and sorting are also introduced in this course. Apart from these, complex data structures like trees and graphs have also been included in this course.	<ul style="list-style-type: none"> • Tenenbaum, A.M. (1990). <i>Data Structures using C</i>. Pearson Education India • Lipschutz, S. (1987), <i>Schaum's Outline of Data Structure</i>. Tata McGraw-Hill. • Kamthane, A.N., <i>Introduction to Data Structures in C</i>, Pearson Education.
	BCA(S2)04: English for Professional Studies	This course deals with English as a subject for study for the Professional courses. English as a global language, with increasing application in an array of professional engagements, has acquired a new importance today. This course aims at equipping the learners with the required knowledge and skill for using English as a medium of communication for diverse professional purposes. Accordingly, the course has been designed to teach the learners the fundamentals of English in terms of grammar, vocabulary and composition, and the division of the units is made to suit that purpose. Relevant emphasis has been given on the general principles of communication as well as the drafting of letters, memos and reports. It goes without saying that the professional executives need adequate linguistic abilities in the transaction of their professional work.	<ul style="list-style-type: none"> • McGee, Paul. <i>How to write a CV that works, revised and updated 4th Edition</i>. • Wall work, Adrian. (2014). <i>CVs, Resume and LinkedIn, A Guide to Professional English</i>. Italy and Springer Science Business Media, New York. • R.C. Sharma, Krishna Mohan, <i>Business Correspondence and Report Writing</i>, 3rd edition. • Lesikar, Flatley. <i>Basic Business Communication</i> 10th Edition.
Semester 3	BCA(S3)01 Object- Oriented Programming Through C++	This course intends to provide the Object-Oriented programming concepts. Apart from the basic features of C++ programming, it discusses the concept of class, objects, constructors, destructors, operator overloading, inheritance and polymorphism.	<ul style="list-style-type: none"> • Balagurusami, E. (2001), <i>Object-Oriented Programming with C++</i>, 6e. Tata McGraw Hill Publication. • Schildt, H. (2003). <i>The Complete Reference C++</i>, Herbert, Tata McGraw Hill Publication. • Venugopal, K. R. <i>Mastering C++</i>. Tata McGraw Hill Publication.
	BCA(S3)02: Database Management	This course introduces the learners to database management systems, which is very essential concept to organize large databases.	<ul style="list-style-type: none"> • Elsmari, R., & Navathe, S. (2000). <i>Fundamentals of database systems</i>. Addison-Wesley, 106, 107.

	Systems	Various concepts associated DBMS like ER model, Relational databases, keys, normalization, database design; relational algebra is included in this course. Apart from these, SQL and various SQL commands are also introduced in this course.	<ul style="list-style-type: none"> • Singh, S. K. (2011). <i>Database systems: Concepts, design and applications</i>. Pearson Education India. • Date, C. J. (2006). <i>An introduction to database systems</i>. Pearson Education India.
	BCA(S3)03: Operating System	This course is on operating system. It includes an introduction to operating systems, processes and threads and inter process communication. The concepts of semaphores, scheduling and deadlocks are also introduced in this course. Apart from these, memory management techniques like segmentation and paging is covered in this course.	<ul style="list-style-type: none"> • Tanenbaum, A. S., & Woodhull, A. S. (1987). <i>Operating systems: design and implementation</i> (Vol. 2). Englewood Cliffs, NJ: Prentice-Hall. • Deitel, H. M. (2004). <i>Operating systems</i>. Pearson Education India.
	BCA(S3)04: Data Communication and Computer Networks	This course begins with a discussion on networking devices and communication principles. It also discusses different layers of the OSI reference network model, network protocols, topology, and many important concepts associated with networking.	<ul style="list-style-type: none"> • B.A. Forouzan, <i>Data Communications and Networking</i>, TMH. • William Stallings, <i>Data and Computer Communications</i>, Sixth Edition, Pearson Education Asia. • Forouzan, A. Behrouz. <i>Data communications & networking (sie)</i>. Tata McGraw-Hill Education, 2006.
Semester 4	BCA(S4)01: Computer Organization	In this course, the learners are introduced to data representation, computer arithmetic and basic organization of computers. Topics like instruction sets, addressing modes, cache and virtual memory are covered in this course. An introduction to parallel processing, RISC and CISC architectures along with parallel architecture are also covered in this course.	<ul style="list-style-type: none"> • Mano, M. M. (2017). <i>Digital logic and computer design</i>. Pearson Education India. • Stallings, W. (2003). <i>Computer organization and architecture: designing for performance</i>. Pearson Education India. • Hamacher, V. C., Vranesic, Z. G., Zaky, S. G., Vransic, Z., & Zakay, S. (1996). <i>Computer organization</i>. McGraw-Hill.
	BCA(S4)02: Programming in Java	This course is designed to introduce the learners to the high-level programming language Java and enable them to apply these concepts for solving problems.	<ul style="list-style-type: none"> • Deitel, P. J. (2002). <i>Java how to program</i>. Pearson Education India. • Kamal, R. (2002). <i>Internet and Web technologies</i>. Tata McGraw-Hill Education. • Godbole, A. S., & Kahate, A. S. G. A. (2002). <i>Web technologies: TCP/IP to Internet application architectures</i>. Tata McGraw-Hill Education. • Laura Lemay <i>Mastering HTML, CSS & Javascript Web Publishing</i>. BPB Publication.
	BCA(S4)03: Environmental Studies and Disaster Management	Environmental and Disaster are the two most discussed terms in the world today. All living and non-living things we see around us contribute a part to our environment. But our environment is subjected to ruthless destruction leading to many problems and even to disasters. Disaster is an event of occurrence due to natural as well as human-induced factors. Generally, it happens without any warning or with a warning of a very short period of time. All disasters cannot be prevented, but if with adequate planning and prior preparations, the impact of disasters can be minimized to a large extent. Therefore, in order to resolve these problems, conservation of the environment is of utmost importance. It is also necessary to study disaster management. On the other hand, environment conservation and disaster management are possible only if the general people are made aware about them	<ul style="list-style-type: none"> • Asthana, D. K. & Meera, A. (2012), <i>A Textbook of Environmental Studies</i>. New Delhi: S. Chand and Company Ltd. • Bharucha, E. (2004). <i>A Textbook of Environmental Studies</i>. New Delhi • Das, A.K. and Saxena, K.G. (1996). <i>Conserving Biodiversity for Sustainable Development</i>. New Delhi: INSA. • Frame, B. and Victor, J. (1993). <i>Biodiversity Conservation</i>. New Delhi: British High Commission. • Heywood, W.H. and Watson, R.T. (1995). <i>Global Biodiversity Assessment</i>. London: Cambridge University Press.
	BCA (S4)04: Software Engineering	This course is on Software Engineering, which describes the engineering approach to software development process. The learners will be acquainted with the methodologies associated with software development, management of software project, staffing, scheduling etc.	<ul style="list-style-type: none"> • Jalote, P. <i>An Integrated Approach to Software Engineering</i>, Narosa Publication. • Awad, E. M., <i>Systems Analysis and Design</i>, Galgotia Publication. • Ravishankar, S., <i>Data Structure and Software Engineering</i>, Himalaya Publishing House.

Semester 5	BCA(S5)01: Linux System Administration	This course introduces learners to system administration using LINUX OS. The course covers installation of LINUX and detailed description of LINUX kernel, file system, file organization. Linux commands along with Shell scripting are also covered in this course in addition to networking in LINUX and network security issues.	<ul style="list-style-type: none"> • Das, S. (2000). <i>UNIX, Concepts and Applications</i>. Tata McGraw-Hill. • Burgess, M. (2004). <i>Principles of network & system admin</i>. John Wiley & Sons. • Bovet, D. P., & Cesati, M. (2005). <i>Understanding the Linux Kernel: from I/O ports to process management</i>. O'Reilly Media, Inc."
	BCA(S5)02: Web Technology	This course deals with the basics of web technology like Internet, web server, web client. Web page designing and developing using HTML, dynamic HTML, JavaScript, AJAX, XML and PHP are discussed in this course.	<ul style="list-style-type: none"> • Deitel & Deitel: <i>Web Technology</i>, Pearson Education. • Raj Kamal: <i>Internet and Web Technologies</i>, Tata McGraw Hill. • Achyut S Godbole, Atul Kahate: <i>Web Technologies – TCP/IP to Internet Architectures</i>, Tata McGraw Hill. • Luke Welling, Laura Thomson, <i>PHP and MySQL Web Development</i>, Addison Wesley Professional. • Julie C. M., Sams; <i>Teach Yourself PHP in 24 Hours</i>, Techmedia
	BCA(S5)03: Computer Graphics	This is a course on computer graphics. Graphics provides one of the most natural means of communicating with a computer, since our highly developed 2D and 3D pattern-recognition abilities allow us to perceive and process pictorial data rapidly and efficiently. This course discusses different algorithms for line drawing, circle drawing, ellipse drawing, filled area, clipping and Bezier and B-spline curves etc. 2-D and 3-D viewing and transformations are also explained in this course.	<ul style="list-style-type: none"> • Hearn, D., & Baker, M. P. (1986). <i>Computer Graphics: By Donald Hearn and M. Pauline Baker</i>. Prentice-Hall. • Plastock, R. A., & Kalley, G. (1986). <i>Schaum's outline of theory and problems of computer graphics</i>. McGraw-Hill. • Foley, J. D., Van, F. D., Van Dam, A., Feiner, S. K., Hughes, J. F., HUGHES, J., & ANGEL, E. (1996). <i>Computer graphics: principles and practice</i> (Vol. 12110). Addison-Wesley Professional.
	BCA(S5)04A: Data Warehousing and Data Mining	This course deals with the basics of data mining and data warehousing. Topics like data warehouse architecture, association rule mining, classification, prediction, evaluation, clustering are covered in this course. Web mining, spatial mining and temporal data mining are also introduced in this course.	<ul style="list-style-type: none"> • Berson, A., & Smith, S. J. (1997). <i>Data warehousing, data mining, and OLAP</i>. McGraw-Hill, Inc. • Ponniah, P. (2004). <i>Data warehousing fundamentals: a comprehensive guide for IT professionals</i>. John Wiley & Sons. • Inmon, W. H. (2005). <i>Building the data warehouse</i>. John Wiley & sons.
	BCA(S5)4B: Fundamentals of Cloud Computing	This course deals with the basics of cloud computing and its service models and deployment models. Introduction to IaaS, PaaS and SaaS are also covered in this course. In addition to these, topics like service management, data management, identity and access management along with cloud security are also covered in this unit.	<ul style="list-style-type: none"> • Mahmood, Z. (Ed.). (2013). <i>Cloud computing: Methods and practical approaches</i>. Springer Science & Business Media. • Buyya, R., Vecchiola, C., & Selvi, S. T. (2013). <i>Mastering cloud computing: foundations and applications programming</i>. Newnes. • Erl, T., Puttini, R., & Mahmood, Z. (2013). <i>Cloud computing: concepts, technology & architecture</i>. Pearson Education.
Semester 6	BCA(S6)01: Image Processing	This course introduces the learners to fundamentals of image processing. The course covers topics like image transformation, image enhancement, image histogram, image restoration, segmentation, noise and filtering.	<ul style="list-style-type: none"> • Gonzalez, R. C., & Woods, R. E. (2007). <i>Image processing. Digital image processing</i>, 2, 1. • Annadurai, S. (2007). <i>Fundamentals of digital image processing</i>. Pearson Education India.
	BCA(S6)02: Open Source Software	This course introduces the learners to Latex from its installation to its applications. Scilab has also been introduced in this course and topics like functions, graphics and applications of Scilab are covered in this course. Programming in Python has also been introduced in this course for the learners.	<ul style="list-style-type: none"> • F. Mittelbach, M. Goossens, (2004), <i>The LaTeX Companion</i>, 2nd ed. Addison-Wesley ISBN 0-201-36299-6. • L. Lammport (1994), <i>LATEX, A Document Preparation System, User's Guide and Reference Manual</i>, 2nd ed., Addison-Wesley, ISBN 0-201-52983-1.

	BCA(S6)03: Project	Project work is to be done by learners using the knowledge acquired and their own programming skills.	Refer to Project Guidelines
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[**Note:** The syllabus of each course shall be intimated to the learners through the SLMs provided to them on the date of admission to each Semester.]

6. LEARNER SUPPORT SERVICES (LSS)

Learner Support Services (LSS) constitute the most important component of the ODL system around the globe in the 21st century. KKHSOU also provides some need based support services, which are as the following:

6.1 Face-to-face Counselling

KKHSOU provides face-to-face contact sessions between the learners and counsellors/tutors at the study centres to clarify their doubts and answer to their academic queries related to their programme of enrolment. This is called 'Academic Counselling', which is normally held on weekends or on Sundays at the KKHSOU Study Centres. You can contact your study centre for the schedule of such counselling programme and seek Academic Counselling for your courses.

Attending the counselling sessions is not compulsory. We however, advise you to attend them as far as possible, because such counselling sessions are very useful for:

- Sharing views and ideas with your counsellors and fellow learners.
- Understanding the complex and difficult issues/topics/ideas discussed in your SLMs.
- Getting clarification on many of your doubts, which you could not have solved yourself.

Note that Counselling is not lecturing, though a counselling session may include a short lecture to trigger a fruitful discussion. In fact, the counselling session is a group activity session, where you participate in discussions, share your views and/or listen to audio/visual programmes and do all other sorts of activities to comprehend your units. Therefore, it is important that you regularly come to the counselling sessions thoroughly prepared, after reading the relevant Blocks and units.

Your Study Centre will inform you about the schedule of counselling sessions. You should contact the Study Centre co-ordinator for the counselling schedule just after you enrol in our University. If your problems are not solved and if the counsellors refuse to hold counselling at the centre, you may immediately inform the university Headquarters. You may also contact the faculty members of Computer Science at KKHSOU through the E-mail ids provided at the end of this Guide. They will personally extend their support and advise as and when necessary.

6.2 ICT-Based Support Services

The following are some of the ICT-based support services of KKHSOU.

- a. **KKHSOU Website:** The University website www.kkhsou.in serves as a single window for obtaining all necessary information regarding the University. The website also includes the customised study centre search facility based on its location or programme on offer.
- b. **Community Radio Service (CR):** “Jnan Taranga” (90.4 MHz) the Community Radio is an important platform for the broadcast of educational programmes, which include debates, discussions and talk shows. The e-Radio can also be accessed through the URL: <http://jnantaranga.kkhsou.in/iradio/>
- c. **Ekalavya:** KKHSOU with the help of Prasar Bharati has launched a special educational programme named ‘Ekalavya’ which is aired every Saturday from 8.00 PM to 8.30 PM through All India Radio, Guwahati and Dibrugarh.
- d. **Akashvani Phone-in Programme:** KKHSOU offers one hour live phone-in programme through AIR, Guwahati and Dibrugarh where officers and experts from the University clarify queries put across to them over telephone. This phone-in programme is aired every Thursday from 9.15 AM to 10.15 AM.
- e. **e-SLM:** This serves as the digital repository where e-study materials are uploaded for the benefit of the learners. E-SLMs can be accessed through: eslm.kkhsou.in.
- f. **KKHSOU Central Library:** The University Library provides access to Online Public Access Catalogues (OPAC), subscribed journals and databases and a huge number of important books in different disciplines. It also provides access to various online directories including Directory of Open Access Journals (DOAJ) and Open Access Journals Search Engine (OAJSE), which can be used to browse and search thousands of Open Access Journals from across the world.
- g. **KKHSOU Digital Library:** This acts as the resource centre for the University. The Digital Library at Krishna Kanta Handiqui State Open University is an online locus for collecting, preserving and disseminating the institute’s output to the Global community. URL: <http://dlkkhsou.inflibnet.ac.in/>
- h. **KKHSOU Mobile APP:** The KKHSOU mobile App, which can be downloaded from Google play store, works as miniature version of the University website.
- i. **KKHSOU YouTube Videos:** Most of the audio-visual educational programmes of KKHSOU can be accessed through <https://www.youtube.com/user/kkhsou>.

7. COURSE ASSESSMENT

Assessment in a course is based on two components—(a) “tutor-marked assignments” (TMAs) and (b) Semester-end examination. You are expected to learn and fully utilise the course materials provided in the form of Self Learning Materials (SLM), and read some of the books from the Further reading list provided at the end of each unit. You are strongly advised to read extra materials related to this course and discuss topics of interest with your course-mates. Important information regarding Course Assessment shall be made available in

the University Website from time to time. Some of you learn best on your own but many of you learn through discussions with your friends and course mates. Opinions and insights you gather while discussing with your course mates are as valuable as those you can acquire from reading and attending the counselling sessions.

When you submit your assignments, you should not present the work of others as your own work. This includes submitting an assignment or part of an assignment, which has been written jointly with other persons or has been copied in its entirety or in part from the works of other persons without proper acknowledgement. Such actions or attempts are considered academic dishonesty (plagiarism). If you violate this norm, you will be liable to disciplinary action as may be specified by the University.

7.1 Tutor-Marked Assignments (TMAs)

Each course of BCA Programme has one set of Assignments of 50 marks. Assignments are compulsory and are supposed to be TMAs (Tutor Marked Assignments). The assignment carries 20% weightage in the final result. You must submit the assignment responses at your study centres as per the date specified.

Please note that assignment is an important component of your study. The purpose of assignments is to help you get through the courses. Your counsellor or evaluator will write comments on your assignment to facilitate your learning. The assignments, being a process of formative evaluation, will help you to understand how you are progressing in your studies. All the assignments submitted earlier will be carried forward. This is applicable, only if you extend your study to the subsequent Semester.

Note: Several ill practices have been reported to the University Headquarters regarding submission of assignments written by others or copying and submission of the same answers by several learners. After detection of such anomalies, KKHSOU reserves the right to penalise such learners. It should always be kept in mind that by adopting unfair practices, the learner is not cheating others except himself or herself.

The following are some important guidelines for writing your assignment responses:

- Make sure that you have answered all the questions of an assignment before you send them to the study centre. Incomplete assignments shall bring you poor grades, or non-submission of assignments in time may lead to withholding of results.
- Answer the questions of the assignment as directed after a careful study of the Units available in the SLMs.
- You should not send printed articles as your answers for assignments, nor should you reproduce the text of the SLMs verbatim. Write assignments in your own words and in your own handwriting. However, don't forget to put your signature at the end. Typed assignment responses are never allowed.
- Ensure that you keep a copy of the assignment responses with yourself. You might need them in case you have to re-submit the assignment responses due to some unforeseen circumstances.
- While submitting the assignment, don't forget to collect the receipt. You may also get the receipt signature from the study centre on the assignment copy kept with you.
- Be precise in your response.

7.2 Practical Components and Projects:

The learners are supposed to take part in the practical sessions for the courses where practical work is required. The practical work for courses can be practised during the practical counselling sessions that are held in study centres. The practical work can also be practised at home if the learner has access to PCs/laptop with the specific software materials.

For project work, the procedure to be followed by the learners is mentioned in the project guidelines. The project guidelines are uploaded in the university website www.kkhsou.in and can be downloaded by the learners from there.

7.3 Semester-end Examination:

KKHSOU conducts Term-end examination twice a year normally in February-March and July-August at the end of the each Semester. You become eligible to sit for the Semester-End Examination for BCA Programme only after the completion of the minimum duration for each Semester. To appear for the Semester-end Examination you should have:

- a. Submitted all the assignments in the prescribed format and within time.
- b. Submitted filled in Examination Form on time as specified by the Controller of Examination.

The final examination shall be conducted at the designated examination centre. The examination will be a proctored examination of three-hour duration for full paper and 2 hours for half paper. The overall assessment is done as per the following:

For courses without practical:

Assignments: 20%

Semester-end Examination: 80%

For courses with practical:

Assignments: 10%

Semester-end Examination (theory): 50%

Semester-end Examination (practical): 40%

Total marks: 100%

Note: The term end exam shall cover all the units in all 4 courses in one Semester. However, in some programmes there is a provision of half paper with 2 credits. The format of examination paper and sample exam paper are made available through the URL: <http://learnerportal.kkhsou.in/>. You may also access the tentative academic calendar through the University website. Besides, all learners may maintain a learning diary regarding important dates such as—date of enrolment, date of submission of assignment, form fill up dates, Semester-end examination dates etc. for their own convenience.

8. FACULTY MEMBERS IN DEPARTMENT OF COMPUTER SCIENCE

1.



Tapashi Kashyap Das

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2.



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9. CONTACT US:

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For Study Centre related issues:

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QR Code for University Website