BCA – 1st Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examinational Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-101	Programming in C	3	-	-	3.0	40	60	-	100
2.	Core	BCA-102	Computer Fundamentals & MS Office	3	-	-	3.0	40	60	-	100
3.	Interdisciplinary	BCA-103	Digital Electronics	3	1	-	4.0	40	60	-	100
4.	Core	BCA-104	Introduction to Information Technology	4	-	-	4.0	40	60	-	100
5.	Ability Enhancement Course	BHUM -011	English	3	-	-	3.0	40	60	-	100
6.	Ability Enhancement Course	HSMC-051	Universal Human Values	3	-	-	3.0	40	60	-	100
7.	Core	BCA-105	C Lab.	-	-	2	1.0	60	-	40	100
8.	Core	BCA-106	MS Office Lab.	-	-	2	1.0	60	-	40	100
			Total	**19**	**1**	**4**	**22.0**	**360**	**360**	**80**	**800**

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 101 Programming in C

Continuous evaluation: 40	**L T P**	**Credits: 3.0**
End semester exam: 60	**3 - -**	**Maximum Time: 3 Hrs.**
Total marks: 100		

Course Objective: The aim of the course is to provide the student with an understanding of basic concepts of computer programming, syntax and semantics of the C language as well as data types. This course also enables the student to write programs in C.

Course Outcome: On completion of the course, students will be able to
- Learn basic terminology used in computer programming.
- Write, compile and debug programs in C language.
- Design programs involving decision structures, loops and functions.
- Design programs with the use arrays and string.
- Understand the dynamics of memory by the use of pointers
- Work with files efficiently.

Section – A (8 Lectures)

Programming Basics: Low level languages, High level languages, Assembly languages, Assembler, Complier, Interpreter, Linker, Loader, Algorithm, Pseudo code and flow charts, Type of errors, Coding, Compilation and Debugging.

Fundamentals of C: Structure of C Program, Character set, Keywords, Identifiers, Constant and variables, Data Types, Operators: unary operators, binary operators, ternary operators, conditional operator, precedence and associativity, format specifiers.

Section – B (12 Lectures)

Design Control and Looping Statements: Conditional Statements (if, if-else, nested if), Iterative Statements (for while do-while), switch Statement, Break and Continue, goto statements.

Arrays and Strings: Declaration of Arrays, Accessing elements of Arrays, Operations on One Dimensional Array: traversing, searching, insertion and deletion of an element. Operations on two Dimensional Array: addition, subtraction, multiplication, Introduction of String and character, String manipulation functions: gets(), puts(), getch(), getche(), getchar().

Section – C (10 Lectures)

Functions: Definition, Function prototype and passing arguments to a function, call by value, call by address, call by reference, Recursive Functions, Storage Classes.

Structure and Union: Definition and initializing structures, accessing structure, Union, array of structure, nested structure, typedef and enumerated data type.

Section – D (12 Lectures)

Preprocessor: File inclusion, Macro Definition, Macro with arguments.

Introduction to Pointers: definitions, Single and double pointer, Null pointer, pointers as function arguments, dynamic memory allocation (concept of malloc, calloc, free and realloc).

File Handling: Introduction to files, type of files, file handling functions: fopen(), fclose(), fgets(), fputs(), fgetc(), fputc(), fscanf(), fprintf(), opening and closing files, Reading and writing data from files.

Instructions for Paper setter: All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. Section A is compulsory and comprises of 12 questions of one mark each, 3 from each unit. The questions shall be asked in such a manner that there are no direct answers including one word answer, fill in the blanks or multiple choice questions. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however each question in section C and D shall have two alternatives, out of which student will be required to attempt one question.

Text Books:
1. E. Balaguruswami, Programming in ANSI C, 6th ed., Tata Mc-Graw Hill, 2012.
2. Yashwant Kanetker, Let us C, 13th ed., BPB Publications, 2013.
3. Bryon Gottfried, Programming with C, 2nd ed., Tata McGraw Hill, 2008.
4. Yashwant Kanetker, Pointers in C, 3rd ed., BPB Publications, 2005.

References Books:

1. Herbert Schildt, C: The Complete Reference, 4th ed., Tata Mc-Graw Hill, 2012.
2. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language, 2nd ed., PHI, 2002.

BCA – 102 Computer Fundamentals & MS Office

Continuous evaluation: 40   L   T   P   **Credits: 3.0**
End semester exam: 60   3   -   -   **Maximum Time: 3 Hrs.**
Total marks: 100

Course Objective: The subject aims to provide the student with an understanding of basic concepts of computer fundamentals and MS office, an introduction to the fundamentals of hardware, software, Input/output devices, Programming languages and MS office, Use of Word Processing Software, to insert formula in Ms-Excel and use of Power point and MS word.

Course Outcome: On completion of the course, students will be able to

- Understanding the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming.
- Understanding the use of Windows Operating System and working.
- Recognize when to use each of the Microsoft Office programs to create professional and academic documents.

Section – A   (10 lectures)

Introduction: Characteristics, Advantages and Limitations, Generations of computers, Block diagram of computer
Types of Computers: Micro, Mini, Main frame, Supercomputers.
Memory: Memory and its types - Random access, Sequential access, Cache memory.
Secondary Storage Devices: Internal & External Hard Drives, Optical Disks-CD, CD-R, CD-RW, DVD, Flash Memory, USB Drives.

Section – B   (12 lectures)

Input Devices: Introduction & Types of I/O devices, Keyboard, Mouse, Touch screens, Joystick, Electronic pen, and Trackball.
Scanning Devices: Optical scanners, OCR, OMR, Bar code readers, MICR, Digitizer, Electronic card reader, Image capturing devices-Digital cameras.
Output Devices: Monitors CRT, LCD/TFT, Printers- Dot matrix, Inkjet, Laser, Plotters- Drum, Flatbed, Screen image projector.

Section – C   (11 lectures)

Windows: Introduction to MS Windows, Benefits, Features & its Uses, Control Panel, Accessories, Task Bar, My Computer, Recycle bin.
MS Office: Elements, Introduction to Office & Features.
MS-Word: Features & its uses, Menus, Toolbars, Cursor, Short Cut & Hot keys, Editing Text, Opening, Creating, saving, Printing, Editing Files, Formatting text, Find and replace, Tables and Columns, Spell check, Thesaurus, File protection, Mail Merge, Macros.

Section – D   (10 lectures)

MS-Excel: Features & its uses, Menus, Toolbars, Worksheets, Formatting, Worksheets and Restricting Data, Column Freezing,Calculating with Formulas and Functions, Ranges, Auto fill, Data (Sort, Filter, Validation, Subtotal), Margins & Space management, Printing of Workbook & Worksheets, Cell Formatting including Borders & Shading; Different Chart Types.

MS-Power Point: Features & its uses, Menus, Toolbars, Creating and Editing Slides, Adding graphics, Multimedia, and Special Effects to Slides, Insert (Picture, Slide & Text), Master Slide, Designing & Presentation of a Slide Show, Views, Animation, Action Buttons, Printing Presentations, Notes, Handouts with print options.

Instructions for Paper setter: All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. Section A is compulsory and comprises of 12 questions of one mark each, 3 from each unit. The questions shall be asked in such a manner that there are no direct answers including one word answer, fill in the blanks or multiple choice questions. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however each question in section C and D shall have two alternatives, out of which student will be required to attempt one question.

Text Books:
1. P.K. Sinha, Priti Sinha, Computer Fundamentals, BPB Publications
2. Pawan Thakur, S.K. Gandhi, Basic Computer Engineering, Satya Prakashan, New Dehli.
3. Habraken, Joe, Microsoft Office 2000 8 in 1, PHI, New Delhi
4. Biswaroop Roy Choudhary, Computer Course, Fusion Books.
5. Ron Masfield, MS-Office, Tech Publication.

Reference Books:
1. Larry long, Nancy long, Fundamental of Computers, Twelfth edition, Prentice Hall
2. Kriti Basandra, Gagan Basandra, Computers Today, Galgotia Publications.
3. D. H. Sanders, Computers Today, Fourth Edition, McGraw Hill.
4. Laura Story, Microsoft Office - Fundamentals, Dawna Walls.

BCA – 103   Digital Electronics

Continuous evaluation: 40   L T P   **Credits: 4.0**
End semester exam: 60   3 1 -   **Maximum Time: 3 Hrs.**
Total marks: 100

Course Objective: To study the basic of digital electronics, Discussions will include digital logic. Such knowledge leads to better understanding and utilization of digital computers, and can be used in the design and application of computer systems or as foundation for more advanced computer hardware-related studies.

Course Outcome: On completion of the course, students will be able to
1. Analyze the characteristics of various gates.
2. Simplify of the Boolean equations and design the gate circuits using various methods.
3. Explain the concepts of different sequential circuits like D, J/K flip flops etc.
4. Classify the various basic memory elements: registers and their concepts.
5. Demonstrate the design of various counters of the computer system.

SECTION – A   (12 Lectures)

Number System: Decimal, Binary, Octal, Hexadecimal Numbers, their addition, subtraction and multiplication, Base conversions, Number code: 8421, BCD, X-3, Grey, ASCII, EBCDIC.
Basic Computer Arithmetic: Addition, Complement subtraction (Base 0's and Base-1's), Binary Operations (multiplication and division)
Boolean Algebra: Laws and theorems of Boolean algebra, De Morgan's theorem.

SECTION – B   (10 Lectures)

Logic Gates and Circuits: OR, AND, NOT, NAND, NOR, XOR and XNOR gates, gate circuits, Half Adder, Half subtractor, Full Adder, Full subtractor.
Sum of products and Product of sums, canonical form, min-term, max-term of Boolean expressions, Truth Tables, Karnaugh maps and its simplification, Don't care condition simplification.

SECTION – C   (12 Lectures)

Combinational Circuits: Multiplexers, De-Multiplexer, BCD to Decimal, Decoder, Encoder, Decimal to BCD-Decoder, characteristics of digital integrated circuits.
Sequential Circuits: RS Latch, RS Flip Flop, D Flip Flop, T Flip Flop, JK Flip Flop, JK Master Slave Flip Flop, Clock wave forms and its characteristics.

SECTION – D   (10 Lectures)

Registers and Counters: Shift registers: SISO, SIPO, PISO, PIPO, Asynchronous counters, Synchronous counters, Designing of modulo-n counter, ring counter, ripple counter, Johnson counter (Twisted Ring Counter), Up-Counter, Down-Counter.

Instructions for Paper setter: All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. Section A is compulsory and comprises of 12 questions of one mark each, 3 from each unit. The questions shall be asked in such a manner that there are no direct answers including one word answer, fill in the blanks or multiple choice questions. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however each

question in section C and D shall have two alternatives, out of which student will be required to attempt one question.

Text Books:
1. Morris Mano, Digital Logic and Computer Design, 2nd ed., PHI, 2005.
2. Floyd, Jain, Digital Fundamentals, 8th ed., Pearson Education, 2009.
3. Malvino, Leach, Saha, Digital Principles and Applications, 7th ed., Mc-Graw Hill, 2012.
4. R.P. Jain, Modern Digital Electronics (Fourth Edition), McGraw Hill

Reference Books:
1. Anand Kumar, Fundamentals of Digital Circuits, 2nd ed., PHI, 2012.
2. R.L. Tokheim, Digital Electronics, Principles and Applications, Tata McGraw Hill, 1999.

BCA – 104 Introduction to Information Technology

Continuous evaluation: 40	**L T P**		**Credits: 4.0**
End semester exam: 60	**4 - -**		**Maximum Time: 3 Hrs.**
Total marks: 100			

Course Objectives: The aim is to prepare the student about Internet terms, concepts and access techniques, characteristics, uses and environments of the Internet's major areas in daily life, to learn fundamental and advanced search techniques for various Internet resources, to identify commercial uses of the WWW, to discuss security, authentication, and on-line transactions.

Course Outcome: On completion of the course, students will be able to
1. Understanding the concept of Information Technology and Security.
2. Working with the web server.
3. Discuss security, authentication, and on-line transactions
4. Understand and apply Internet terms, concepts and access techniques
5. Understanding the working of Email

Section – A   (10 lectures)

Introduction to Information Technology: Definition, Characteristics, advantages & disadvantages, Components of Information Technology, Role of Information Technology.

The Internet: Internet Evolution, Basic Internet Terminology, Working of Internet: internet, intranet & extranet, Applications of Internet, Modes of Connecting to Internet, Internet Service Providers (ISPs). Basic of Computer Network, Types of Network, Types of Topologies.

Section – B   (12 lectures)

World Wide Web: Introduction to Web Browsers, Web Browsing Softwares, Searching the www: Directories Search Engines, Meta Search Engines, Search Fundamentals, Search Strategies, Working of the Search Engines, Understanding URL, Domain Name, DNS, IP Address, Modems and Types of Modem, Telnet, FTP, HTTP, TCP/IP.

Section – C   (10 lectures)

Electronic Mail: Introduction, advantages and disadvantages, User Ids, Passwords, e-mail addresses, message components, message composition, mailer features, E-mail Inner workings, E-mail Management, MIME Types, Newsgroups, Mailing lists, Chat Rooms, Secure-mails, SMTP.

Section – D   (10 lectures)

Privacy and Security: Introduction, Principles of Security, Computer Security, Software Complexity, Security Threats, Encryption, Public Key Encryption, Private key Encryption, HTTP, HTTPs Secure Web document, Digital Signatures, Firewalls, Intrusion Detection Systems.

Instructions for Paper setter: All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. Section A is compulsory and comprises of 12 questions of one mark each, 3 from each unit. The questions shall be asked in such a manner that there are no direct answers including one word answer, fill in the blanks or multiple choice questions. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however each question in section C and D shall have two alternatives, out of which student will be required to attempt one question.

Text Books:
1. Jennifer Sargunar, Introduction to Information Technology, Pearson, 2nd ed., 2013.
2. Margaret Levine Young, The Complete Reference: Internet, Tata McGraw Hill, 2002.
3. Roberta Bragg, Mark Rhodes-ouseley & Keith Strassberg, The Complete Reference: Network Security, Tata McGraw Hill, 3rd ed., 2005.
4. Alex Leon & Mathews Leon, Fundamentals of Information Technology, Leon Techworld, 2nd ed., 1999.
5. Deitel, Deitel & Nieto, Internet & World Wide Programming, Pearson Education, 2000 Education.

Reference Books:
1. Norton Peter, Introduction to computers, 4th ed., TMH, 2001.
2. Simon Haykins, Communication System, John Wiley & Sons, 1999.

BHUM – 011   English

Continuous evaluation: 40   **L T P**   **Credits: 3.0**
End semester exam: 60   **3   -   -**   **Maximum Time: 3 Hrs.**
Total marks: 100

Course Objective: The course is designed for the students who need English for specific purpose (ESP). It aims to impart and nurture the skills of communication (listening, vocabulary building, speaking, reading and writing) required for the learners in their academic, social & professional pursuits. The course puts emphasis on the practical usage of English.

UNIT-1: Grammar and Editing

Basics of Grammar (Parts of Speech—Noun, Pronoun, Adjective, Adverb, Conjunction, Preposition, Interjection, Verb)
Advanced Grammar (Syntax and Common Errors—pertaining to different part of speech focusing on editing activities)

UNIT-2: Common Vocabulary

Idioms and Phrases (specially used in the fields of legal studies)
Words often confused
One word Substitution
Homophones and Homonyms

UNIT-3: Composition Skills

Paragraph Writing
Official Letter/Application
E mail Writing

UNIT 4: Reading Skills

Reading Comprehension
Précis

Instructions for Paper setter: The examiner will set five questions of 12 marks each selecting at least one question from each unit. All questions are compulsory. There may be internal choice.

Suggested Readings:
1. A Practical English Grammar by Thomson and Martinet 4th Edition, 1986.
2. English Grammar and Composition by Rajendra Pal (Sultan Chand and Co. New Delhi) Vol II, 2011.
3. You Can Win by Shiv Khera, Macmillan Books, New York, 2003.
4. Business Correspondence and Report Writing by R.C. Sharma & Bishan Mohan (Tata Mc-Graw Hill Company, New Delhi).
5. The Functional Aspects of Communication Skills by P. Prasad and Rajendra K. Sharma (S.K. Kataria & Sons, New Delhi), 2007.
6. Lesikar's Basic Business Communication by Raymond Lesikar & Others (Mc-Graw Hill Co. USA), 1998.
7. The Oxford Guide to Writing and Speaking, (John Seely, Oxford University Press, New Delhi) (2004) Effective Technical Communication, M. Ashraf Rizvi, (Tata Mc-Graw Hill Publishing Company Ltd.), 2005.

HSMC - 051   Universal Human Values

Continuous evaluation: 60	**L T P**		**Credits: 3.0**
End semester exam: 40	**3 - -**		**Maximum Time: 3 Hrs.**
Total marks: 100			

Course Objective: The aim of the course is to develop a holistic perspective based on self- exploration about themselves family, Society and nature / existence, to understand of the harmony in the human being, family, society, and nature / existence, to strengthen of self –reflection, to develop commitment and courage to act.

Unit-I: Course Introduction- Need, basic guidelines, content and process for value education

1. Purpose and motivation for the course, recapitulation from Universal Human Value-1
2. Self - Exploration-What is it? Its content and process; Natural 'Acceptance' and Experiential validation - as the process for the self-exploration.
3. Contentious Happiness and prosperity - A look at basic Human Aspirations.
4. Right understanding relationship and physical facility- the basic requirement for fulfillment of aspirations of every human being with their correct priority.
5. Understanding Happiness and prosperity correctly - A Critical Appraisal of the current scenario
6. Method to fulfil the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility rather than as arbitrariness in choice based on liking -disliking.

Unit-II: Understanding Harmony in the Human Being - Harmony in Myself

1. Understanding human being as a co-existence of the sentient 'I' and the material Body.
2. Understanding the needs of self and body- happiness and physical facility.
3. Understanding the body as an instrument of 'I'
4. Understanding the characteristics and activities of 'I' and Harmony in 'I'
5. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
6. Programs to ensure Sanyam and Health.
7. Include practice sessions to discuss the role other have played in making material goods available tome. Identifying from one's own life.
8. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

Unit-III: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

1. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
2. Understanding the meaning of Trust; Difference between intention and competence
3. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
4. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals.
5. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives.

Unit-IV: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence
1. Understanding the harmony in the Nature
2. Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self-regulation in nature.
3. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space.
4. Holistic perception of harmony at all levels of existence.
5. Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.
6. Natural acceptance of human values Universal Order
7. Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
8. Case studies of typical holistic technologies, management models and production systems

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions e.g. to discuss the conduct as an engineer or scientist etc.

Text Books:
1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010

Reference Books:
1. Leevan Vidya: EkParichaya, A Nagaraj, Amarkantak, 1999. Jeevan Vida Prakashan.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi.
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews.
7. Economy of Permanence - J C Kumarappa.
8. Bharat Mein Angreji Raj – Pandit Sunderlal.
9. Rediscovering India - by Dharampal.
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi.
11. India Wins Freedom - Maulana Abdul Kalam Azad.
12. Vivekananda - Romain Rolland (English).