Department of Information Technology

Bachelor of Computer Application (Honours)

L T P - Indicates Theory Lectures (L), Tutorial(T) and Practical (P) classes per week.
1L Earns 1 credits
1P Earns 0.5 credits
1T Earns 1 Credit

Sl. No.	Category	Course Code	Course Name	L	T	P	Credits
Semester I							
Theory + Practical							
1	**CC1**	**BCAC101** **BCAC191**	**Programming for Problem Solving**	**4**	**0**	**4**	**6**
2	CC2	BCAC102 BCAC192	Digital Electronics	4	0	4	6
3	**AEC-1**	**BCAA101**	**Soft Skills**	**2**	**0**	**0**	**2**
4	GE-1	BCAG101 BCAG102 BCAG103 BCAG104	A. MOOCS Basket 1 B. MOOCS Basket 2 C. MOOCS Basket 3 D. MOOCS Basket 4	4/ 5	0/ 1	4/ 0	6
			Total Credit				20

CC: Core Course
GE: General Electives (To be selected from MOOCs Basket listed below)
AEC: Ability Enhancement Course
SEC: Skill Enhancement Course

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Semester-1

Name of the Course: BCA **Subject:** Programming for Problem Solving	
Course Code: BCAC101 + BCAC191	**Semester: 1st**
Duration: 36 Hours	**Maximum Marks: 100 + 100**
Teaching Scheme	**Examination Scheme**
Theory: 4	End Semester Exam: 70
Tutorial: 0	Attendance : 5
Practical: 4	Continuous Assessment: 25
Credit: 4 + 2	Practical Sessional internal continuous evaluation: 40
	Practical Sessional external examination: 60

Aim:	
Sl. No.	
1	In-depth understanding of various concepts of programming language.
2	Ability to read, understand and trace the execution of programs
3	Skill to debug a program.
4	Skill to write program code in C to solve real world problems.

Objective:	
Sl. No.	
1	To introduce students to a powerful programming language
2	To understand the basic structure of a program
3	To gain knowledge of various programming errors.
4	To enable the students to make flowchart and design an algorithm for a given problem.
5	To enable the students to develop logics and programs

Pre-Requisite:	
Sl. No.	

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1	Understanding of basic mathematical logic.		

Contents			
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	Introduction to Computers Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Software Development, Flow charts. Number Systems: Binary, Octal, Decimal, Hexadecimal Introduction to C Language - Background, C Programs, Identifiers, Data Types, Variables, Constants, Input / Output Statements Arithmetic Operators and Expressions: Evaluating Expressions, Precedence and Associativity of Operators, Type Conversions.	6	10
02	Conditional Control Statements Bitwise Operators, Relational and Logical Operators, If, If- Else, Switch-Statement and Examples. Loop Control Statements: For, While, DoWhile and Examples. Continue, Break and Goto statements Functions: Function Basics, User-defined Functions, Inter Function Communication, Standard Functions, Methods of Parameter Passing. Recursion- Recursive Functions.. Storage Classes: Auto, Register, Static, Extern, Scope Rules, and Type Qualifiers.	8	10
03	Preprocessors and Arrays Preprocessor Commands Arrays - Concepts, Using Arrays in C, Inter-Function Communication, Array Applications, Two- Dimensional Arrays, Multidimensional Arrays, Linear and Binary Search, Selection and Bubble Sort.	8	10
04	Pointers Pointers for Inter-Function Communication, Pointers to Pointers, Compatibility, Lvalue and Rvalue, Arrays and Pointers, Pointer Arithmetic and Arrays, Passing an Array to a Function, Memory Allocation Functions, Array of Pointers, Programming Applications, Pointers to void, Pointers to Functions, Command Line Arguments. Strings - Concepts, C Strings, String Input/Output Functions, Arrays of Strings, String Manipulation Functions.	**8**	**20**
05	Structures and File Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Self Referential Structures, Unions, Type Definition (typedef), Enumerated Types. Input and Output: Introduction to Files, Modes of Files, Streams, Standard Library Input/Output Functions, Character Input/Output Functions.	**6**	**20**
	Sub Total:	**36**	**70**

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	Internal Assessment Examination & Preparation of Semester Examination		30
	Total:		**100**

Practical
Course Code: BCAC191
Credit: 2
Skills to be developed:
Intellectual skills:
1. Ability to read, understand and write computer programs.
2. Ability to analyze problems and provide program based solutions.

List of Practical:
1. Write a c program to display the word "welcome".
2. Write a c program to take a variable int and input the value from the user and display it.
3. Write a c program to add 2 numbers entered by the user and display the result.
4. Write a c program to calculate the area and perimeter of a circle.
5. Write a C program to find maximum between two numbers.
6. Write a C program to check whether a number is divisible by 5 and 11 or not.
7. Write a C program to input angles of a triangle and check whether triangle is valid or not.
8. Write a C program to check whether a year is leap year or not.
9. Write a C program to input basic salary of an employee and calculate its Gross salary according to following:
   Basic Salary <= 10000 : HRA = 20%, DA = 80%
   Basic Salary <= 20000 : HRA = 25%, DA = 90%
   Basic Salary > 20000 : HRA = 30%, DA = 95%
10. Write a c program to print "welcome" 10 times.
11. Write a c program to print first n natural numbers using while loop.
12. Write a c program to print all the odd numbers in a given range.
13. Write a c program to add first n numbers using while loop.
14. Write a c program to print all numbers divisible by 3 or 5 in a given range.
15. Write a c program to add even numbers in a given range.
16. Write a c program to find the factorial of a given number.
17. Write a c program to find whether a number is prime or not.
18. Write a c program to print the reverse of a number.
19. Write a c program to add the digits of a number.
20. Write a c program to print the fibonacci series in a given range.
21. Write a c program to check whether a number is an Armstrong number or not.
22. Write a c program to find g.c.d. and l.c.m. of two numbers.

Assignments:
   Based on the curriculum as covered by subject teacher.

List of Books
Text Books:

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Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
E. Balaguruswamy	Programming in ANSI C		Tata McGraw-Hill
Gary J. Bronson	A First Book of ANSI C	4th Edition	ACM
Reference Books:			
Byron Gottfried	Schaum's Outline of Programming with C		McGraw-Hill
Kenneth A. Reek	Pointers on C		Pearson
Brian W. Kernighan and Dennis M. Ritchie	The C Programming Language		Prentice Hall of India

List of equipment/apparatus for laboratory experiments:	
Sl. No.	
1.	Computer with moderate configuration
2.	A programming language compiler

End Semester Examination Scheme.   **Maximum Marks-70.**   **Time allotted-3hrs.**

Group	Unit	Objective Questions (MCQ only with the correct answer)	Subjective Questions

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		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	1 to 5	10	10				
B	1 to 5			5	3	5	70
C	1 to 5			5	3	15	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to be set	Question to be answered
A	All	1	10	10
B	All	5	5	3
C	All	15	5	3

Examination Scheme for Practical Sessional examination:

Practical Internal Sessional Continuous Evaluation

Internal Examination:

Five No of Experiments			

External Examination: Examiner-

Signed Lab Note Book(for five experiments)	5*2=10	
On Spot Experiment(one for each group consisting 5 students)	10	
Viva voce	5	

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Name of the Course: BCA **Subject: Digital Electronics**	
Course Code: BCAC102 + BCAC192	**Semester: 1st**
Duration: 48 Hours	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 4	End Semester Exam: 70
Tutorial: 0	Attendance : 5
Practical: 4	Continuous Assessment: 25
Credit: 4 + 2	Practical Sessional internal continuous evaluation: 40
	Practical Sessional external examination: 60

Aim:	
Sl. No.	
1	To gain skill to build and troubleshoot digital logic circuits
2	To gain skill to use the methods of systematic reduction of Boolean expressionusingK-Map
3	To be able to interpret logic gates and its operations
4	Familiarization with semiconductor memories in electronics.

Objective:	
Sl. No.	
1	To gain basic knowledge of digital electronics circuits and its levels.
2	To understand and examine the structure of various number system and its conversation.
3	To learn about the basic requirements for a design application
4	To enable the students to understand,analyze and design various combinational and sequential circuits
5	To understand the logic functions, circuits, truth table and Boolean algebra expression

Pre-Requisite:	
Sl. No.	**None**

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Contents			
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Number Systems & Codes** Decimal Number, Binary Number, Octal Number, Hexadecimal Number, Conversion – Decimal to Binary, Binary to Decimal, Octal to Binary, Binary to Octal, Hexadecimal to Binary, Binary to Hexadecimal, Octal to Binary to Hexadecimal, Hexadecimal to Binary to Octal; Floating Point Number Representation, Conversion of Floating Point Numbers, Binary Arithmetic, 1's and 2's Complement, 9's and 10's Complement, Complement Arithmetic, BCD, BCD addition, BCD subtraction, Weighted Binary codes, Non-weighted codes, Parity checker and generator, Alphanumeric codes.	5	10
02	**Logic Gates** OR, AND, NOT, NAND, NOR, Exclusive – OR, Exclusive – NOR, Mixed logic.	2	10
03	**Boolean Algebra** Boolean Logic Operations, Basic Law of Boolean Algebra, Demorgan's Theorem, Principle of Duality.	4	10
04	**Minimization Techniques** Sum of Products, Product of Sums, Karnaugh Map [up to 4 variables].	3	10
05	**Multilevel Gate Network** Implementation of Multilevel Gate Network, Conversion to NAND-NAND and NOR-NOR Gate Networks.	2	5
06	**Arithmetic Circuits** Half Adder, Full Adder, Half Subtractor, Full Subtractor, Carry Look Ahead Adder, 4-Bit Parallel Adder	5	5
07	**Combinational Circuits** Basic 2-input and 4-input multiplexer, Demultiplexur, Basic binary decoder, BCD to binary converters, Binary to Gray code converters, Gray code to binary converters, Encoder.	5	5
08	**Sequential Circuits** Introduction to sequential circuit, Latch, SR Flip Flop, D Flip Flop, T Flip Flop, JK Flip Flop, Master Slave Flip Flop	5	5
09	**Basics of Counters** Asynchronous [Ripple or serial] counter, Synchronous [parallel] counter	2	5
10	**Basics of Registers** SISO, SIPO, PISO, PIPO, Universal Registers	3	5
	Sub Total:	36	70

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	Internal Assessment Examination & Preparation of Semester Examination		30
	Total:		**100**

Assignments:
Based on the curriculum as covered by subject teacher.

Practical
Course Code: BCAC192
Credit: 2

List of Practicals:-
1. Realization of basic gates using Universal logic gates.
2. Code conversion circuits- BCD to Excess-3 and vice-versa.
3 Four-bit parity generator and comparator circuits.
4. Construction of simple Decoder and Multiplexer circuits using logic gates.
5. Design of combinational circuit for BCD to decimal conversion to drive 7-segment display using multiplexer.
6. Construction of simple arithmetic circuits-Adder, Subtractor.
7. Realization of RS-JK and D flip-flops using Universal logic gates.

8. Realization of Universal Register using JK flip-flops and logic gates.
9. Realization of Universal Register using multiplexer and flip-flops.
10. Realization of Asynchronous Up/Down counter.
11. Realization of Synchronous Up/Down counter.
12. Realization of Ring counter and Johnson's counter.
13. Construction of adder circuit using Shift Register and full Adder.
List of Books

Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
Salivahan	Digital Circuit & Design		VIKAS
M. Morris. Mano & Michael D. Ciletti	Digital Design		PEARSON
Anand Kumar	Fundamentals of Digital Circuits		PHI

Reference Books:

Tokheim	Digital Electronics		TMH
S. Rangnekar	Digital Electronics		ISTE/EXCEL

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End Semester Examination Scheme.		**Maximum Marks-70.**			**Time allotted-3hrs.**	

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	1 to 10	10	10				
B	1 to 10			5	3	5	70
C	1 to 10			5	3	15	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to be set	Question to be answered
A	All	1	10	10
B	All	5	5	3
C	All	15	5	3

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Name of the Course: BCA **Subject: Soft Skills**	
Course Code: BCAA101	**Semester: 1st**
Duration: 36 Hours	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 2	End Semester Exam: 70
Tutorial: 0	Attendance : 5
Practical: 0	Continuous Assessment: 25
Credit: 2	Practical Sessional internal continuous evaluation: 0
	Practical Sessional external examination: 0

Aim:	
Sl. No.	
1.	Ability to read English with ability to read English with understanding and decipher paragraph patterns, writer techniques and conclusions
2.	Skill to develop the ability to write English correctly and master the mechanics of writing the use of correct punctuation marks and capital letter
3.	Ability to understand English when it is spoken in various contexts.

Objective:	
Sl. No.	
1.	To enable the learner to communicate effectively and appropriately in real life situation
2.	To use English effectively for study purpose across the curriculum
3.	To use R,W,L,S and integrate the use of four language skills, Reading, writing , listening and speaking.
4.	To revise and reinforce structures already learnt.

Aim:	
Pre-Requisite:	
Sl. No.	
1.	Basic knowledge of English Language.

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Contents			
Chapter	**Name of the Topic**	**Hours**	**Marks**
02	**Grammar** Correction of sentence, Vocabulary / word formation, Single word for a group of words, Fill in the blank, transformation of sentences, Structure of sentences – Active / Passive Voice – Direct / Indirect Narration.	**6**	**10**
03	**Essay Writing** Descriptive – Comparative – Argumentative – Thesis statement-Structure of opening / concluding paragraphs – Body of the essay.	**5**	**10**
04	**Reading Comprehension** Global – Contextual – Inferential – Select passages from recommended text .	**5**	**10**
05	**Business Correspondence** Letter Writing – Formal.Drafting.Biodata- Resumeʹ- Curriculum Vitae.	**5**	**10**
06	**Report Writing** Structure , Types of report – Practice Writing.	**5**	**10**
07	**Communication skills** Public Speaking skills , Features of effective speech, verbal-nonverbal.	**5**	**10**
08	**Group discussion** Group discussion – principle – practice .	**5**	**10**
	Sub Total:	36	70
	Internal Assessment Examination & Preparation of Semester Examination		30
	Total:		100

Assignments:
    Based on the curriculum as covered by the subject teacher.

List of Books
Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
Mark MaCormack	Communication		
John Metchell	How to write reports		
S R Inthira & V Saraswathi	Enrich your English – a) Communication skills b) Academic skills		CIEFL & OUP

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Reference Books:			
R.C. Sharma and K.Mohan	Business Correspondence and Report Writing		Tata McGraw Hill
L.Gartside	Model Business Letters		Pitman

List of equipment/apparatus for laboratory experiments:	
Sl. No.	
1	Computer with moderate configuration
2	Audio visual Setup.

End Semester Examination Scheme.   **Maximum Marks-70.**   **Time allotted-3hrs.**

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	1 to 8	10	10				
B	1 to 8			5	3	5	70
C	1 to 8			5	3	15	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to be set	Question to be answered
A	All	1	10	10
B	All	5	5	3
C	All	15	5	3

Examination Scheme for Practical Sessional examination:

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Practical Internal Sessional Continuous Evaluation			
Internal Examination:			
Five No of Experiments			
External Examination: Examiner-			
Signed Lab Note Book(for five experiments)	5*2=10		
On Spot Experiment(one for each group consisting 5 students)	10		
Viva voce	5		

** General Electives to be chosen from MOOCs basket based on availability of courses.

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** MOOCs Basket

GE Basket 1		GE Basket 2		GE Basket 3		GE Basket 4	
Mathematics		Humanities and Social Sciences		General Science		Emerging Technologies, Innovation & Entrepreneurship	
1	Mathematics for Computing	1	Creative Writing	1	Climate Change and Health	1	Digital Marketing
2	Probability & Statistics	2	Business English	2	Environmental Law and Policy	2	Entrepreneurship Theory and Practice
3	Bayesian Statistics	3	Leadership	3	Environmental Informatics	3	Project Management
4	Operations Research	4	Professional Communication	4	Health Informatics	4	E-Commerce System Development
5	Data Analytics	5	E-Learning	5	Intelligence of Biological Systems	5	Effective Problem-Solving and Decision-Making
6	Applied Cryptography	6	Model Thinking	6	Simulation and Modelling Natural Processes	6	Business Analytics
7	Inferential Statistics	7	Digital Transformation and Industry 4.0	7	Bioinformatics	7	Design Thinking for Innovation