



B.Sc. (CS) Semester-IV

Course Code	US04MACSC01	Title of the Course	Advanced C Programming and Introduction to Data Structures
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	<ol style="list-style-type: none"> 1.To study the concepts of structures and unions in the C programming language. 2.To understand various file handling operations in C. 3. To learn the basic concepts related to data structures. 4. To gain fundamental knowledge on stacks, queues and linked lists. 5. To learn the basics of sorting and searching techniques.
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Course Content		
Unit	Description	Weightage* (%)
1.	Structures and Unions <ul style="list-style-type: none"> – Basics of structures, Structures and functions, Structures and arrays – Pointers to structures, Nested structures – Unions, working with unions – Structures versus Unions – Typedef and enum keyword 	25%
2.	File Handling <ul style="list-style-type: none"> – Introduction to file handling and its usage – Operations on files, File access modes, Handling text files – File management I/O functions 	25%
3.	Introduction to Data Structures, Stack and Queue <ul style="list-style-type: none"> – Introduction to data structures, their usage, applications and advantages, Primitive and non-primitive data structures and operations on them, Linear and non-linear data structures – Stacks : Introduction to stacks, operations on stacks, Applications of stacks – Queues: Queues and their uses, Types of queues: Simple queues, Circular queues, Double-ended queues 	25%
4.	Linked Lists, Sorting and Searching Techniques <ul style="list-style-type: none"> – Introduction to linked lists: Types of linked lists, Singly linked lists, doubly linked lists, Circular linked lists, Applications of 	25%





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	linked lists – Sorting and Searching Techniques: Basic sorting techniques (Bubble, Selection, Insertion), Searching techniques (Sequential and Binary)	
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Teaching-Learning Methodology	Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes : Having completed this course, the learner will be able to understand	
1.	the basics of structures and unions in the C programming language.
2.	various file handling operations in C.
3.	the fundamental concepts related to data structures.
4.	the basics of stacks, queues and linked lists.
5.	the basic sorting and searching techniques.

Suggested References:	
Sr. No.	References
1.	Balaguruswami, Programming in ANSI C., Tata McGraw Hill Publication, 2008.
2.	Cooper H. & Mullish H., The Spirit of C, Jaico Publication House, New Delhi, 2006.





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3.	Kernighan B., Ritchie D., The C Programming Language, Prentice Hall, 1988.
4.	Tremblay J. & Sorenson P.G., An Introduction to Data Structures with application, 2nd Edition, McGraw-Hill International Edition, 1987.
5.	Singh Bhagat & Naps Thomas, Introduction to Data Structures, Tata McGraw-Hill Publishing Co. Ltd., 1985.

On-line resources to be used if available as reference material

On-line Resources

<http://www.w3schools.com/>





(B. Sc.) (Computer Science)
B. Sc. (CS) Semester-IV

Course Code	US04MACSC02	Title of the Course	Web Application Development – II
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	<ol style="list-style-type: none"> 1. To study the fundamental concepts of scripting languages. 2. To gain basic knowledge on JavaScript and client-side web application development. 3. To understand JavaScript control statements and loops. 4. To learn the concepts related to JavaScript functions and arrays. 5. To study JavaScript DOM, objects and events.
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Course Content		
Unit	Description	Weightage* (%)
1.	Introduction to Scripting Languages and Basics of JavaScript <ul style="list-style-type: none"> – Concept of Client-Side and Server-Side scripting, – Needs of scripting languages. – Introduction to JavaScript with examples – JS data types, variables, operators, arithmetic 	25%
2.	JavaScript Control Statements and Loops <ul style="list-style-type: none"> – Conditional Statements: if statement, if..else, if..elseif..else, Switch – Looping Statements: for, for/in, while, do/while – JS Break and Continue statements 	25%
3.	JavaScript Functions and Arrays <ul style="list-style-type: none"> – Defining functions, returning values from functions, user-defined functions – Introduction to arrays, creating and accessing elements of array – JavaScript Array Methods: toString(), join(), pop(), push(), shift(), unshift(), sort() 	25%
4.	JavaScript DOM, Objects and Events <ul style="list-style-type: none"> – Introduction to DOM, Methods, Documents and Elements – JS Object Concept: Definition, Properties, Methods – Concept of events, events: onBlur, onChange, onClick, onFocus, onMouseOver, onKeyPress, onReset 	25%





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Teaching-Learning Methodology	Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to explain	
1.	the basic concepts of scripting languages.
2.	the fundamentals of JavaScript and client-side web application development.
3.	JavaScript control statements and loops.
4.	JavaScript functions and arrays.
5.	JavaScript DOM, objects and events.

Suggested References:	
Sr. No.	References
1.	Beginning Java script, Paul Wilton, Jeremy Mc Peak, 4th edition, Wiley Pub., 2009.
2.	Java script Bible, Danny Goodman, Micheal Morrison, 7th edition, Wiley Pub., 2010.

On-line resources to be used if available as reference material
On-line Resources
www.w3schools.com





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Course Code	US04MACSC03	Title of the Course	Practical Based on US04MACSC01 and US04MACSC02
Total Credits of the Course	4	Hours per Week	8

Course Objectives:	<ol style="list-style-type: none">1. To apply the concepts of Advanced C programs2. To apply the concepts of data structures using C programming.3. To apply the concepts Java Script Programming.
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Course Content		
Part	Description	Weightage* (%)
I.	Practical Based on US04MACSC01	50%
II.	Practical Based on US04MACSC02	50%

Teaching-Learning Methodology	Practical-based learning in small groups and Hands on training through required ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%





Course Outcomes: Having completed this course, the learner will be able to

1.	Learn how to implement Structures, Unions and File Handling programs in C.
2.	Learn how to implement various operations on stacks, queues and Linked lists by developing programs in C.
3.	Learn how to implement Java Script Programs.

On-line resources to be used if available as reference material

On-line Resources

w3schools.com





B.Sc. (CS) Semester-IV

Course Code	US04MICSC01	Title of the Course	Fundamentals of Web Application Development
Total Credits of the Course	2	Hours per Week	2

Course Objectives:	To understand 1. the fundamental concepts related to Internet and World Wide Web. 2. the basics of Web page designing, Frames and Forms.
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Course Content		
Unit	Description	Weightage* (%)
1.	Introduction to Internet and Basics of HTML <ul style="list-style-type: none">– Introduction to Internet and Basics of HTML– Services provided by the Internet and introduction to email, HTTP, FTP, Telnet, WWW– Basic terminology and concepts like URL, Webpage, Website, Web servers, Web browsers, Search Engines– Components of a browser window– Use of menus and toolbar buttons– Security and privacy precautions– Introduction to HTML, HTML tags, Structure of HTML document,– Text and Paragraph formatting, ordered and unordered lists	25%
2.	Web Page Designing, Frames and Forms <ul style="list-style-type: none">– Hyperlink, image tag– HTML tables– Frames, framesets, nested framesets– Designing HTML forms– Webpage layout– Multimedia tags (audio, video), Webpage layout	25%

Teaching-Learning Methodology	Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to	
1.	understand the fundamental concepts related to Internet and World Wide Web.
2.	understand Web page designing, Frames and Forms.

Suggested References:	
Sr. No.	References
1.	Ivan Bay ross, Web Enabled Commercial Applications Development using HTML, DHTML, Java script, Perl CGI, BPB, 2004.
2.	Bhaumik Shroff, Introduction to Internet and HTML scripting, 2nd edition, Ahmedabad Books India, 2008.
3.	Douglas E Comer, The Internet, Second Edition, PHI, May 2000.

On-line resources to be used if available as reference material	
On-line Resources	
1.	https://www.tutorialspoint.com/
2.	http://www.w3schools.com/
3.	https://www.javatpoint.com/





(B. Sc.) (Computer Science)
B. Sc. (CS) Semester-IV

Course Code	US04MICSC02	Title of the Course	Practical Based on US04MICSC01
Total Credits of the Course	2	Hours per Week	4

Course Objectives:	To apply the concepts of Web page designing, Frames and Forms.
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Description	Weightage* (%)
Practical Based on US04MICSC01 (Fundamentals of Web Application Development)	100%

Teaching-Learning Methodology	Practical-based learning in small groups and Hands on training through required ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to	
1.	apply the concepts of Web page designing, Frames and Forms.

On-line resources to be used if available as reference material
On-line Resources
w3schools.com





B. Sc. (CS) (Semester-IV)

Course Code	US04SECSC01	Title of the Course	Information Technology Fundamentals – IV (ITF-IV)
Total Credits of the Course	2	Hours per Week	2

Course Objectives:	<ol style="list-style-type: none"> 1. To understand the concepts of System and System Development Life Cycle (SDLC). 2. To impart knowledge on fact finding techniques, input/output design and Data Flow Diagrams.
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Course Content		
Unit	Description	Weightage* (%)
1.	System Analysis and Design - I <ul style="list-style-type: none"> – Introduction to the concept of a system with examples – Elements and characteristics of systems – Types of systems – Introduction to System Analysis – Role of a System Analyst – Introduction to System Development Life Cycle (SDLC) – System Analysis: problem identification, feasibility study, system requirement analysis – System Design: System design specification, programming, System implementation, follow up and maintenance, testing and evaluation 	50
2.	System Analysis and Design - II <ul style="list-style-type: none"> – Introduction and need of Fact Finding Techniques – Fact Gathering Techniques: Interviewing, Questionnaires, Record Inspection and Observation techniques – Input Design: Introduction to Data Capture, Objectives of Data Capture, Steps for Data Capture – Output Design: Design Principles of Output, Output objectives, Types of Outputs, Various forms of Outputs – Meaning and Significance of Data Flow Diagrams (DFDs) – Symbols used in DFDs – Rules for Constructing DFDs – Introduction and comparison between Physical and Logical DFDs 	50





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Teaching-Learning Methodology	Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Evaluation	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to	
1.	gain knowledge about Systems and System Development Life Cycle (SDLC).
2.	understand the concepts of fact finding techniques, input/output design and Data Flow Diagrams.

Suggested References:	
Sr. No.	References
1.	S. Parthasarthy & B. W. Khalkar, System Analysis & Design, 1st Edition, Master Ed. Cons.,Nashik, 2009.
2.	James A. Senn, Analysis & Design of Information Systems, 2nd Edition, McGraw-Hill Int., 1989.
3.	V.Rajaraman, Analysis & Design of Information Systems, Printice Hall of India Private Ltd., 2003.

