DEPARTMENT OF COMPUTER SCIENCE

With effect from the academic year 2017-2020

Aim:

To provide a high-quality undergraduate education in computer science that prepares students for productive careers and lifelong learning.

Objectives

1. To demonstrate proficiency in problem-solving techniques using the computer.
2. To demonstrate proficiency in at least two high-level programming languages and two operating systems
3. To show the ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
4. To show the ability to function effectively on teams to accomplish a common goal.
5. To sensitize the students to the social realities around them with the vision of making them responsible citizen.

Eligibility Norms for Admission

Those who seek admission to B.Sc. Computer Science must have passed the Higher Secondary Examinations conducted by the Board of Higher Secondary Examination, Tamil Nadu with Computer Science or Maths as one of the subjects or any other examination recognized and approved by the Syndicate of the Manonmaniam Sundaranar University, Tirunelveli.

Duration of the Programme : 3 years

Medium of Instruction   : English

Passing Minimum

A minimum of 40% in the external examination and an aggregate of 40% is required. There is no minimum pass mark for the Continuous Internal Assessment.

Components of the B.Sc. Computer Science Programme

Part III – (Major and Allied)

Major	Core - Theory papers	(12 x 100)	1200
	Practicals (Core applied)	(6 x 50) + (3x 100)	600
	Project	(1 x 100)	100
	Elective- Theory papers	(3 x100)	300
	Major – Total marks		**2200**

Allied (I & II)

	Theory	(4 x 100)	400
	Allied - Total marks		400
	Part III – Total marks		**2600**

All theory papers carry 100 marks each.

Major practicals during I and II year carry 50 marks each.

Major practicals during III year carry 100 marks each.

Practical examinations will be conducted at the end of odd and even semesters.

Course Structure
Distribution of Hours and Credits

Course	Sem. I	Sem.II	Sem.III	Sem. IV	Sem. V	Sem. VI	Total Hours	Total Credits
Language	6(3)	6(3)			-	-	12	6
English	6(3)	6(3)			-	-	12	6
Major Core – Theory	4(4)	4(4)	5(4) + 5(4) + 5(4)	5(4) + 5(4)	6(5) + 5(5)	5(5) + 5(5) + 5(5)	59	53
Major Core – Practical	4(2)	4(2)	4(2) 4(2)	4(2) 4(2)	6(3)	4(2) 4(2)	38	19
Elective	-	-	-	5(5)	5(5)	5(5)	15	15
Project	-	-	-	-	6(5)		6	5
Allied- Theory	4(4)	4(4)	5(4)	5(4)	-	-	18	16
AECC	2(2)	2(2)	-	-			4	4
SBC	-	-	2(2)	2(2)	2(2)	2(2)	8	8
NMEC	4(2)	4(2)	-	-	-	-	8	4
* FC - I (Values for Life)	-	(1)	-	-	-	-	-	1
* FC – II (Personality Development)	-	-	-	(1)	-	-	-	1
*FC – III (HRE)					(1)			1
*FC – IV (WS)						(1)		1
*SDP -Certificate Course	-	(1)	-	-	-	-	-	1
*SLP –Extension Activity(RUN)	-	-	(1)	-	-	-	-	1
*STP – Clubs & Committees/ NSS	-	-	-	(1)	-	-	-	1
Total	**30(20)**	**30(22)**	**30(23)**	**30(25)**	**30(26)**	**30(27)**	**180**	**140+3**

Total number of hours   =   180

Total number of credits   =   140+3

* Courses / Programmes conducted outside the regular working hours

Courses Offered

Semester	Course	Subject Code	Paper	Hours / Week	Credit
I	**Part I**	TL1711 FL1711	Language : Tamil French	6	3
	Part II	GE1714	General English	6	3
	Part III	SC1711	Major Core I: Programming in C	4	4
		SC17P1	Practical I: Programming in C Lab	4	2
		SA1711	Allied I: Theory : Digital Computer Fundamentals	4	4
	Part IV	AEC171	Ability Enhancement Compulsory Course (AECC): English Communication	2	2
		SNM171	Non Major Elective Course(NMEC): CorelDraw	4	2
		VEC172	Foundation Course I: Values for Life	-	-
	Part V	SDP172	Skill Development Programme (SDP): Certificate Course	-	-
		STP174	Student Training Programme (STP): Clubs & Committees / NSS	-	-
II	**Part I**	TL1721 FL1721	Language : Tamil French	6	3
	Part II	GE1724	General English	6	3
	Part III	SC1721	Major Core II: Object Oriented Programming in C++	4	4
		SC17P2	Practical II: Programming in C++ Lab	4	2
		SA1721	Allied II: Theory: PC Hardware and Troubleshooting	4	4
	q Part IV	AEC172	Ability Enhancement Compulsory Course (AECC): Environmental Studies	2	2
		SNM172	Non Major Elective Course (NMEC): Internet and its Applications	4	2

		VEC172	Foundation Course I: Values for Life	-	1
	Part V	SDP172	Skill Development Programme (SDP): Certificate Course	-	1
		STP174	Student Training Programme (STP): Clubs & Committees / NSS	-	-
III	**Part III**	SC1731	Major Core III: Programming in Java	5	4
		SC1732	Major Core IV: Microprocessor and Assembly Language Programming	5	4
		SC1733	Major Core V: Data Structures and Algorithms	5	4
		SC17P3	Practical III: Programming in Java Lab	4	2
		SC17P4	Practical IV: Data Structure using C++ Lab	4	2
		SA1731	Allied III: Theory: Numerical and Statistical Methods	5	4
	Part IV	SBC173 / SBC174	Skill Based Course (SBC): Yoga / Computer Literacy	2	2
		VEC174	Foundation Course II: Personality Development	-	-
	Part V	STP174	Student Training Programme (STP): Clubs & Committees / NSS	-	-
		SLP173	Service Learning Programme (SLP): Extension Activity (RUN)	-	1
IV	**Part III**	SC1741	Major Core VI: Web Programming	5	4
		SC1742	Major Core VII: RDBMS with Oracle	5	4
		SC1743 SC1744 SC1745	Elective I: (a) System Analysis and Design (b) Software Engineering (c) Object Oriented Analysis and Design	5	5
		SC17P5	Practical V: Web Programming Lab	4	2
		SC17P6	Practical VI: Oracle Lab	4	2

		SA1741	Allied IV: Theory: Operations Research	5	4
	Part IV	SBC173 / SBC174	Skill Based Course (SBC): Yoga / Computer Literacy	2	2
		VEC174	Foundation Course II: Personality Development	-	1
	Part V	STP174	Student Training Programme (STP): Clubs & Committees / NSS	-	1
V	**Part III**	SC1751	Major Core VIII: Web Technology	6	5
		SC1752	Major Core IX: Operating Systems	5	5
		SC1753 SC1754 SC1755	Elective II (a) Data Communication and Computer Networks (b) Data Mining (c) Image Processing	5	5
		SC17P7	Practical VII: Web Technology Lab	6	3
		SC17PR	Project	6	5
	Part IV	SSK175	Skill Based Course (*SBC): Photoshop	2	2
		HRE175	Foundation Course III: Human Rights Education (HRE)	-	1
VI	**Part III**	SC1761	Major Core X: Android Application Development	5	5
		SC1762	Major Core XI: Computer Graphics and Multimedia	5	5
		SC1763	Major Core XII: UNIX and Shell Programming	5	5
		SC1764 SC1765 SC1766	Elective III (a) Mobile Computing (b) Client / Server Technology (c) Artificial Intelligence and Expert System	5	5
		SC17P8	Practical VIII: Android Application Development Lab	4	2
		SC17P9	Practical IX: Computer Graphics and Multimedia Lab	4	2
	Part IV	SSK176	Skill Based Course (*SBC): Dreamweaver CS4	2	2

		WSC176	Foundation Course IV: Women's Studies (WS)	-	1
			TOTAL	**180**	**140+3**

*SBC for the V & VI semesters is offered by the departments for their students

SBC - We offer Photoshop and Dreamweaver CS4 during V & VI semester. The objective of Photoshop is to work with Images and Dreamweaver CS4 is to design webpage.

NMEC – We offer CorelDraw and Internet & its Applications during I and II semester. The objective of CorelDraw is to work with 2D Graphics and Internet & its Applications to design webpage and browse in internet.

Project – We offer project in V semester. The aim is to equip the students to develop real time projects.

Self Learning – Extra Credit Course

Semester	Subject code	Title of the paper	Hours / week	Credit
III	SC17S1	**Flash**	**-**	2
IV	SC17S2	**Maya**	**-**	2

Instruction for Course Transaction
Theory (Major Core) paper Hours

Components	Sem. I	Sem. II	Sem. III	Sem. IV	Sem. V	Sem. VI
Lecture Hours	50	50	60	60	75	60
Assignment / Group discussion	5	5	5	5	5	5
CIA (Test, Quiz)	5	5	5	5	5	5
Seminar	-	-	5	5	5	5
Total Hours / Semester	**60**	**60**	**75**	75	**90**	75

Theory (Elective/ Allied) paper hours

Components	Elective		Allied			
	Sem. V	Sem. VI	Sem. I	Sem. II	Sem. III	Sem. IV
Lecture Hours	65	65	50	50	65	65
Assignment / Group discussion	5	5	5	5	5	5
CIA (Test, Quiz)	5	5	5	5	5	5
Total Hours	**75**	**75**	**60**	**60**	**75**	**75**

Practical Hours

	Semester	Hours per week	Total hours / semester
Major	**I / II**	4	60
	III / IV	8	120
	V	6	90
	VI	8	120

Value Added Courses

S.No.	Name of the course	Total hours	Credit
I	**PC Hardware & Networking**	**30**	**1**
II	**Content Management System**	**30**	**1**

1. **PC Hardware & Networking**

    This course enables students to identify and rectify the onboard computer hardware, software and network related problems.

2. **Content Management System**

    This course provides capabilities for multiple users with different permission levels to manage content, data or information of a website.

Examination Pattern

Ratio of Internal and External:

(Major / Elective /Allied)	25:75	NMEC	40:60

Components of Internal:

	Test	:	15	Test	:	20
	Quiz	:	5	Quiz	:	10
	Assignment	:	5	Assignment	:	10
	Total	**:**	**25**	**Total**	**:**	**40**

Question Pattern (Major / Allied / Elective)

Internal Test	Marks	External Exam	Marks
Part A 4x1 (No Choice)	4	Part A 10x1 (No Choice)	10
Part B 2x5 (Internal Choice)	10	Part B 5x5 (Internal Choice)	25
Part B 2x8 (Internal Choice)	16	Part B 5x8 (Internal Choice)	40
Total	**30**	**Total**	**75**

Question Pattern (NMEC)

Internal Test	Marks	External Test	Marks
Part A 4x1 (No Choice)	4	Part A 10x1 (No Choice)	10
Part B 3x3 (Internal Choice)	9	Part B 5x3 (Internal Choice)	15
Part B 1x7 (Internal Choice)	7	Part B 5x7 (Internal Choice)	35
Total	**20**	**Total**	**60**

Practical Papers

> **Major – I & II years**
> Internal   : 20 marks
> External   : 30 marks
> **Total   : 50 marks**

> **Internal: 20 marks**
> Performance of the experiments : 2.5
> Regularity in attending practical
>   and submission of records : 2.5
> Model exam   : 10
>   Record   : 5
>   **Total   : 20 marks**

> **External: 30 marks**
> Major practicals   : 20
> Minor practicals   : 10
> Spotters (5 x 1½)   : 7.5
> Record   : 2.5
>   **Total   : 30 marks**

Practical Papers (Major - III year & Allied)

     Internal   : 40 marks
     External   : 60 marks
      Total   : 100 marks

Internal: 40 marks

     Performance of the experiments : 10
     Regularity in attending practical
         and submission of records : 5
     Record   : 10
     Model exam   : 15
       Total   : 40 marks

External: 60 marks

     Major practicals   : 25
     Minor practicals   : 20
     Spotters (4 x 2½)   : 10
     Record   : 5
       Total   : 60 marks

Semester I

CorelDraw (NMEC)

Sub. Code: SNM171

No. of hours per week	No. of credits	Total no. of hours	Total marks
4	2	60	100

Objectives:

1. To enables our students to acquire practical proficiency for work with 2D graphics.

2. To obtain the knowledge and ideas of various designing aspects.

Unit I

CorelDraw Basics: Getting started with CorelDRAW – Creating a new file – The CorelDRAW Screen – Property Bar – Drawing Basic Geometric Figures – Drawing Polygons – Saving a file – Closing a File – Opening an Existing Corel Drawing – Views – The View Manager – Undoing, Redoing and Repeating Actions.

Unit II

Drawing and Selecting: Getting familiar with the Toolbox – Getting Started with the Project – More about Lines – Working with Objects Shapes – Using the Transformations Docker – Adding Effects to Objects.

Unit III

Working with Text: The Text Tool – Getting Started with the Book Cover – Converting from One Text Type to another – Formatting Text – The Text Editor.

Unit IV

Working with Images: Bitmap and Vector Images – Importing Images – Resizing, Rotating and Skewing Images – Cropping an Image – Importing Images from a CD – Converting to Bitmap.

Unit V

Adding Special effects to Bitmaps – Exporting Files to other Applications – Publishing to PDF – Backup and Recovering File.

Text Book:

Vikas Gupta, (2009). *Comdex DTP Course Kit.* (2nd edition). New Delhi: DreamTech Press.

Reference Books:

1. Steve Bain, (2002). *CorelDraw 11: The Official Guide.* (2nd edition). New Delhi: McGraw-Hill/Osborne Media.

2. Steve Bain, & Nick Wilkinson, (2004). *CorelDraw 12: The Official Guide.* (1st edition). New Delhi: McGraw Hill Professional.

3. Kogent Solutions Inc, (2008). *CorelDraw X4 in Simple Steps.* (3rd edition). New Delhi: Dreamtech Press.

4. Gary David Bouton, (2011). *CorelDraw X5*. (8th edition). New Delhi: McGraw Hill Education.

5. Gary David Bouton, (2015). *CorelDraw X7*. (11th edition). New Delhi: McGraw Hill Education

Semester II

Internet and its Applications (NMEC)

Sub. Code: SNM172

No. of hours per week	No. of credits	Total no. of hours	Total marks
4	2	60	100

Objectives:

1. To enable the students to browse internet, to create and use e-mail ID, to chat, and to have an exposure to designing web pages.
2. To enable the students to understand computer concepts, internet skills and uses a Web designing Lang.

Unit I

Introduction to Computers Programming Language: Types – History of Internet – Personal Computers – History of World Wide Web – Micro Software - .NET – Java – Web Resources.

Unit II

Web Browsers: Internet Explorer – Connecting to Internet – Features of Internet Explorer6 – Searching the Internet – Online help and tutorials – File Transmission Protocol (FTP) – Browser Settings.

Unit III

Electronic mail: Creating an E-mail ID – Sending and Receiving Mails – Attaching a File – Instance Messaging – Other Web Browsers.

Unit IV

Introduction to HTML: Headers – Linkers – Images – Special Characters and Line Breaks – Lists – Simple HTML Programs.

Unit V

Tables and Forms: Creating a Table – Formatting a Table – Adding Objects to Table – Creating a Form – Formatting a Form - Frames

Text Books:

1. ITL Education Solutions Limited, (2005). *Introduction to Information Technology*. (7th edition). Singapore: Pearson Education.

2. Xavier, C. (2010). *World Wide Web Design with HTML*. (23rd edition). New Delhi: TMH Publication.

Reference Books:

1. Dave Roberts, (1996). *Internet Protocols Handbook: The Most Complete Reference for Developing Internet Applications*. (3rd edition). New Delhi: Galgotia Publications.

2. McBride, P.K. (2006). *Communicating with E-mail and the Internet*. (1st edition). UK: Butterworth-Heinemann Publishers.

3. Jon Duckett, (2011). *HTML and CSS: Design and Build Websites*. (3rd edition). New Jersey: John Wiley & Sons.

4. Oliver Hersent, David Boswarthick, & Omar Elloumi, (2011). *The Internet of Things*. (2nd edition). New Jersey: John Wiley & Sons Publications.

5. Rizwan Ahmed, P. (2013). *Internet and its Application*. (2nd edition). Chennai: Margham Publications

Semester IV

Major Core VI: Web Programming

Sub. Code: SC1741

No. of Hours per Week	Credit	Total No. of Hours	Marks
5	4	75	100

Objectives:

1. To enable the students to understand the programming features of .Net Framework using ASP.NET and C#.

2. To develop dynamic web pages and various software applications which inbuilt the entrepreneurship skill.

Unit I

ASP.Net 3.5 Essentials: New Features in ASP.Net 3.5-The ASP.Net Life Cycle-Overview of Visual Studio 2008-Exploring a sample ASP.Net-Creating a sample ASP.Net Website. **Web Forms: Standard Control:** The Label Control-The Button Control-The Textbox-The Hidden Field Control-File Upload Control-The Image Control-The ImageMap Control-The ListBox Control-The Drop-Down List Control- The Checkbox Control—The Radio Button Control-User Controls and Custom Controls-Working with User Control-Working with Custom Controls.

Unit II

Navigation Control: The TreeView Control-Creating the TreeView Control-Generating TreeView form a Database-Using the Menu Class-The Menu Control-Creating Static Menus-Creating Dynamic Menus. **Validation Control:** Introduction-The Required Field Validation Control-The Range Validator Control-The Regular Expression Validator Control-The Compare Validator Control-The Custom Validator Control-The Validation Summary Control.

Unit III

Working with Database Controls: The GridView Control-The DataList Control-The DetailsView Control-The FormView Control-The ListView Control-The Repeater Control- The SqlDataSource Control-The AccessDataSource Control-The ObjectDataSource Control-The XmlDataSource Control. **Introducing Login Controls:** The Login Control-The LoginView Control-The LoginStatus Control- The LoginName Control-The Password Recovery Control.

Unit IV

Introducing C# 2008: Need of C# - C# Preprocessor Directives-New Features of 2008-Creating A Simple C# 2008 Console Application-Identifiers And Keywords-Data Types, Variables, and Constants-Expressions and Operators. **Namespace, Classes, Objects, and Structs:** Namespaces-Classes and Objects-Constructors and Destructors-Static Classes and Static Class Members-Properties-Indexers-Structs.

Unit V

Object Oriented Programming: Encapsulation–Inheritance-Polymorphism-Abstraction-Interfaces. **Pointers, Delegates and Events:** Delegates, Events. **Flow Control and Exceptional Handling:** Control Flow statements-Exceptional handling.

Text Book:

Kogent Learning Solutions Inc., (2011). *NET 3.5 Programming - Black Book.* (New Edition). New Delhi: DreamTech Press Publication.

Chapters: 26, 29, 30,31,33,39.

Chapters: 11, 12,13,14,15

Reference Books:

1. Kogent Learning Solutions Inc., (2010). *C# 2008 Programming - Black Book.* (Platinum Edition). New Delhi : DreamTech Press Publications.

2. Reynald Adolphe , (2016). *Expert Programming In C# and .Net.* (2nd edition). Bangalore: Packt Publication.

3. Richaro Peres, (2016). *Entity Framework Core Cookbook.* (2nd edition). Bangalore: Packt Publication.

4. Matthew Mac, Donald and Màrio Szpuszta, (2008). *Pro Asp.Net 3.5 in C# 2008.* (2nd edition). Hariyana: Apress Publication.

5. Jeff Martin, (2016). *Visual Studio 2015.* (2nd edition), Bangalore: Packt Publicatio
6.

Semester IV

Elective I

(b) Software Engineering

Sub. Code: SC1744

No. of Hours per Week	Credit	Total No. of Hours	Marks
5	5	75	100

Objectives:

1. To design, test, and to maintain the software's.
2. To be employed in industry, government, or entrepreneurial endeavours to demonstrate professional advancement through significant technical achievements.

Unit I

Introduction: FAQ about Software Engineering – Professional and ethical responsibility. **Socio Technical Systems:** Emergent System Properties – System Engineering - Organizations, People and Computer Systems – Legacy Systems. **Critical System:** A Simple Safety - Critical System – System dependability – Availability and Reliability – Safety.

Unit II

Software Process: Software Process Models – Process iteration-Process Activities – The Rational Unified Process – CASE - Project Management: Management Activities – Project Planning - Project Scheduling- Risk Management. **Software Requirements:** Functional and Non-functional requirements - User requirements – System requirements – Software requirements document. **Requirements Engineering Process:** Feasibility Studies – Requirements Elicitation and Analysis – Requirements Validation.

Unit III

System Models: Context Models - Behavioural Models - Data Models - Object Models - Structured Methods – **Formal Specification:** Formal Specification in the Software Process - **Sub System Interface Specification Design:** Architectural design decisions – System Organization – Modular Decomposition Styles – Control Style. **Object Oriented Design:** An Object Oriented Design Process – Design Evolution.

Unit IV

Rapid Software Development: Agile Methods – Extreme Programming – Rapid Application Development – Software Prototyping – Component. **Based Software Engineering:** Components and Components Models – The CBSE Process – Component Composition. **Software Evolution:** Program evolution dynamics – Software Maintenance – Evolution Process. **Verification and Validation:** Planning verification and validation - Software inspections - verification and formal methods.

Unit V

     Software Testing: System testing – Component Testing – Test Case Design – Test Automation. **Software Cost Estimation:** Software Productivity – Estimation Techniques – Algorithmic Cost Modelling - Project duration and staffing. **Quality Management:** Process and Product quality – Quality Assurance and Standards - Quality Planning. **Configuration Management:** Configuration Management Planning - Change Management – CASE tools for Configuration Management.

Text Book:

     Ian Sommerville, (2007). *Software Engineering.* (7th edition). New Delhi: Pearson Publication.

Reference Books:

1. Roger S. Pressman, (2004). *Software Engineering Concepts*. (6th edition). New Delhi: McGraw Hill Publication.

2. Richard Fairly, (2006). *Software Engineering*. (6th edition).New Delhi: Tata McGraw Hill Publication.

3. John Sonmez, (2004). *The Complete Software Developer's Career Guide.* (3rd edition). Haryana: Simple Programmer Publishing.

4. Rod Stephens, (2001). *Beginning Software Engineering*. (1st edition). New Delhi: Wrox Publication.

5. Frank Tsui, (2014). *Essentials of Software Engineering*. (2nd edition).Hyderabad: Bartlett Publication.

Semester V
Major Core VIII: Web Technology
Sub. Code: SC1751

No. of Hours per Week	Credit	Total No. of Hours	Marks
6	5	90	100

Objectives:

1. To enable the students to understand the basic concepts and architecture involved in web technology, scripting languages and mark-up languages.
2. To implement the professional ethics to design web pages.

Course Outcome

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO -1	develop an ability to design and implement static and dynamic web pages.	**PSO – 4**	**C**
CO -2	differentiate web applications using client-side (JavaScript, HTML, XML) and server-side technologies (ASP.NET, ADO.NET).	**PSO –7**	**AP**
CO -3	define the fundamental ideas and standards underlying Web Service Technology	**PSO – 1**	**U**
CO -4	apply the knowledge of the internet and related internet concepts that are vital in understanding web application development and analyze the insights of internet programming to implement complete application over the web.	**PSO –11**	**AP**

Unit I

Introduction to Web Technologies: History of the Web – Understanding Web System Architecture – Understanding 3-Tier Web Architecture – Web Browsers. **HTML and JavaScript Programming:** Introducing HTML Document Structure – Creating Headings on a Web Page – Working with Links – Creating a Paragraph – Working with Images – Working with Tables – Working with Frames – Introduction to Forms and HTML Controls – Introducing Cascading Style Sheets.

Unit II

Introducing JavaScript – Handling Events – Using Variables in JavaScript – Using Array in JavaScript – Creating Objects in JavaScript – Using Operators – Working with Control Flow Statements – Working with Functions.

Unit III

Introducing PHP: Version of PHP – Features of PHP - Creating a PHP Script – Running a PHP Script – Handling Errors in a PHP Script – Escape Characters. **Working with Variables and Constants:** Using Variables – Using Constants – Exploring Data Types in PHP – Exploring Operators in PHP. **Controlling Program Flow:** Conditional Statements - Looping Statements - Break, Continue, Exit Statements. **Working with Functions, Arrays, Files and Directories:** User-Defined Functions in PHP – Built-in Functions in PHP - Introducing Arrays - Types of Arrays - Working with Files - Working with Directories.

Unit IV

Working with Forms and Database: Introduction to Web Forms – Working with <form> Tag and Form Elements – Processing a Web Form – Validating a Form – Introducing Databases – Using PHP and MySql. **Exploring Cookies, Session and PHP Security:** Working with Cookies – Working with Sessions – Protecting Data – Configuring PHP Security.

Unit V

Introduction to XML: Definition of XML – XML Versus HTML – Electronic Data Interchange (EDI) – XML Terminology – Introduction to DTD – Document Type Declaration – Elements Type Declaration – Attribute Declaration – Limitation of DTDs – Introduction to Schema – Complex Types – Extensible Style Sheet Language Transformations (XSLT).

Text Books:

1. Kogent Learning Solutions Inc., (2012). *Web Technologies Black Book*. (New Edition). New Delhi: DreamTech Press Publishers.

   Chapters: 1, 2, 3, 4, 5, 6, 7, 8

2. Achyut S. Godbole & Atul Kahate, (2008).*Web Technologies TCP/IP Architecture and Java Programming*. (2nd edition). New Delhi: Tata McGraw Hill Publications.

   Chapters: 13

Reference Books:

1. Achyut S.Godbole & Atul Kahate, (2008).*Web Technologies TCP/IP to Internet Application Architecture*. (2nd edition). New Delhi: Tata McGraw Hill Publications.

2. Uttam K.Roy, (2010).*Web Technologies*. (2nd edition). Pune: Oxford University Press.

3. Craig Grannell, (2008).*The Essential Guide to CSS and Html Web Design*. (2nd edition).Bombay: Apress Publication.

4. Jennifer Niederst Robbins, (2012). *Learning Web Design*. (4th edition).Bombay: O'reilly Publication.

5. David Pitt, (2014).*Modern Web Essential Javascript & Html5*. (2nd edition), New Delhi: Infoq Publication

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Semester V
Elective II - (c) Image Processing
Sub. Code: SC1755

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No. of Hours per Week	Credit	Total No. of Hours	Marks
5	5	75	100

Objectives:

1. To learn and understand the fundamentals of digital image processing, and various image Transforms, Image Enhancement Techniques, image compression and Segmentation used in digital image processing.

2. To develop the skill in students to able to apply the tools in the laboratory in image restoration, enhancement and compression.

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Course Outcome

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CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO -1	recall the basic image related concepts	**PSO – 1**	**R**
CO -2	interpret image compression, image segmentation, representation techniques	**PSO - 1**	U
CO -3	categorized various compression techniques	**PSO –7**	**AP**

CO -4	analyze images in the frequency domain using various transforms.	**PSO –12**	**AN**
CO - 5	evaluate the techniques for image enhancement.	**PSO –11**	**E**

Unit I

    Introduction: Fundamentals - Digital Image Representation - Fundamental steps in Image Processing. **Elements**: DIP systems - Digital Image fundamentals - Visual Perception - Image Model - Sampling and Quantization - Pixel Relationships - Image Geometry - Photographic Film.

Unit II

    Image Enhancement: Spatial Domain methods - Frequency Domain methods – Enhancement by point processing – Spatial Filtering – Enhancement in the Frequency domain – Specifications – Color Image Processing.

Unit III

    Image Compression: Fundamentals – Image Compression models – Elements of Information Theory – Error-Free Compression – Lossy Compression – Image Compression Standards.

Unit IV

    Image Segmentation: Detection of discontinuities – Edge linking and Boundary detection – Thresholding – Region Orientation segmentation – Use of motion in segmentation.

Unit V

    Representation and Description: Representation Schemes – Boundary Descriptors – Regional Descriptors – Morphology – Relational Descriptors.

Text book:

    Rafael C. Gonzalez and Richard E. Woods, (1992). Digital Image Processing. (1st edition). New Delhi: Pearson education Publication.

Reference Books:

1. Annadurai, (2006). *Fundamentals of Digital Image Processing*. (1st edition). New Delhi: Pearson Publication.

2. Chedchen,(2006). *Signal and Image processing for Remote Sensing*. (1st edition). New Delhi: Pearson Publication.

3. Castleman, (2007). *Digital Image Processing*. (3rd edition). New Delhi: Pearson India.

4. Mart J. Burge, Willhelm Burger, (2009). *Principles of Digital Image Processing*. (1st edition). New Delhi: Springer India Private limited.

5. Jayaraman, S., Esakkirajan S., Veerakumar, T. (2017). *Digital Image Processing*. (1st edition). New Delhi: McGrow Hill Education.

Semester V
SBC - Photoshop
Sub. Code: SSK175

No. of Hours per Week	Credit	Total No. of Hours	Marks
2	2	30	100

Objectives:

1. To enable students to create images for web design, logos, graphics, layouts, image touch-ups and colour enhancement.
2. To develop the skills for manipulating the images creatively.

Course Outcome

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO -1	understand retouch and repair a scanned photograph.	PSO –10	AP
CO -2	create abilities to use Photoshop that are employable and rewarding.	PSO – 3	C
CO -3	understand how to do basic photo repairs and color enhancements techniques.	PSO –11	AP
CO -4	define and apply the basic functions of pixel selection, painting and editing tools	PSO - 5	R
CO -5	understand file compression, Import and export files and save files in different formats	PSO –11	AN
CO -6	utilize retouching features to make picture perfect	PSO - 11	C

Unit I

Starting Photoshop CS2 : Getting Started with Photoshop CS2 – Opening an Existing File – The Photoshop Program Window – Guidelines for Working with Toolbox – Screen Modes – Creating a New File – Saving Files – Removing Files – Closing File.

Unit II

Working with Images: Vector and Bitmap Images – Opening Recently used Files – Image Size – Image Resolution – Editing Images – Opening Files Created in Illustrator or Freehand – Color Modes – Setting a Current Foreground and Background Colors – File Formats.

Unit III

Making Selections: Making Selection – The Grow and Similar Commands – Moving a Portion of an Image – Editing Selections – Copying a Selection into another Image – Filling a Selection – Transforming Selections.

Unit IV

Painting, Drawing and Retouching Tools: The painting Tools – The Drawing Tools – The Retouching Tools – **Layers** - Layers Palette – Working with Layers.

Unit V

Filters: The Filter Menu – Filter Gallery – Extract Filter – Liquify Filter – Vanishing Point Filter – Artistic Filters – Blur Filters – Brush Stroke Filters.

Text Book:

Vikas Gupta, (2009). *Comdex DTP Course Kit*. (2nd edition). New Delhi: DreamTech Press Publications.

Reference Books:

1. Martin Evening, (2012). *Adobe Photoshop CS6 for Photographers*. (2nd edition). New Delhi: Elsevier Pvt. Ltd.

2. Tanya Staples, (2005). *Photoshop CS2 for the Web*. (2nd edition). New Delhi: Peachpit Press.

3. Taz Tally, (2006). *Photoshop CS2 Before and After Makeovers*. (2nd edition). New York: John Wiley & Sons Publisher.

4. Philip Andrews, (2005). *Adobe Photoshop CS2*. (2nd edition). New Delhi: Focal Press.

5. Kogent Learning, (2012). *Photoshop CS2 in Simple Steps*. (3rd edition). New Delhi: Dreamtech Press

Professional Ethics