

**Name of the Programme** : B.Sc. Computer Science  
**Course Code** : CSC-131  
**Title of the Course** : Emerging Trends in Computer  
**Number of Credits** : 3T  
**Effective from AY** : 2023-24

<b>Pre-requisites for the Course:</b>	NIL	
<b>Course Objectives:</b>	This course will – 1. enable students to explore current breakthrough technologies in the areas of Artificial Intelligence (AI), Big data and Business Intelligence, IOT, Blockchain that have emerged over the past few years. 2. prepare the students to use technology in their respective professional preparations.	
<b>Content:</b>		<b>No. of Hours</b>
	<b>Unit 1: Artificial Intelligence &amp; Business Intelligence (BI) and Big data</b> AI Concept, Scope of AI, Components of AI, Types of AI, Machine Learning (ML) and Natural Language Processing (NLP), Applications of AI, the state of art AI today  BI- Definition, Importance, Benefits of Business Intelligence, How BI process works, Stages of Business Intelligence. Big data – Definition, Characteristics, Challenges with Big Data, Traditional Business Intelligence (BI) versus Big Data. Big Data Applications in Business	<b>15</b>
	<b>Unit2: Internet of Things (IoT) and Embedded Systems</b> Definition, Characteristics of Embedded System, Real time systems, Real time tasks.  Processor basics: General Processors in Computer Vs Embedded Processors, Microcontrollers, Microcontroller Properties, Components of Microcontrollers, Components of Embedded Systems, Introduction to embedded processor  Definition, Characteristics of IoT, Trends in Adoption of IoT, IoT Devices, IoT Devices Vs Computers, Societal Benefits of IoT, Technical Building Blocks. IoT functional blocks, IoT enabling technologies, IoT levels and deployment templates, Applications in IoT.	<b>15</b>
	<b>Unit 3: Cloud Computing &amp; Blockchain and Cryptocurrency</b> Importance of Cloud Computing, Characteristics, Pros and Cons of Cloud Computing, Migrating into the Cloud, Seven-step model of migration into a Cloud, Trends in Computing. Cloud Service  Models: SaaS, PaaS, IaaS, Storage, Cloud Architecture: Cloud Computing Logical Architecture, Developing Holistic Cloud	<b>15</b>

	<p>Computing Reference Model, Cloud System Architecture, Cloud Deployment Models.</p> <p>Introduction to Blockchain Technology and its Importance, Evolution of the Blockchain Technology, Elements of a Blockchain A basic crypto currency, Creation of coins, Payments and double spending,</p> <p>Bitcoin –Digital Signatures as Identities – eWallets – Personal Crypto security - Bitcoin Mining</p>	
<b>Pedagogy:</b>	PowerPoint, YouTube Videos	
<b>References/ Readings:</b>	<p>Main Reading:</p> <ol style="list-style-type: none"> <li>1. Stuart Russel and Peter Norvig (2015), <i>“Artificial Intelligence: A Modern Approach”</i>, 3<sup>rd</sup> Edition, Pearson</li> <li>2. V.K Jain (2018), <i>“Big Data and Hadoop”</i>, 2<sup>nd</sup> Edition, Khanna Publishing</li> <li>3. Tejaswini N and Yathish R(2019), <i>“Blockchain for Beginners: The Art of Decentralization &amp; Cryptography”</i>, 1<sup>st</sup> Edition, Shroff/X-team</li> <li>4. Cuno Pfister(2011), <i>“Getting Started with the Internet of Things”</i>, 1<sup>st</sup> Edition, Make Community</li> <li>5. ArsheepBahga, Vijay MADisetti(2015), <i>“Internet of Things: A Hands-On Approach”</i>, 1<sup>st</sup> Edition, Orient Blackswan Private Limited - New Delhi</li> <li>6. Anandamurugan, T.Priyaa, M.C. Arvind Babu(2017), <i>“Cloud Computing”</i>, 1<sup>st</sup> Edition, Laxmi Publications Pvt. Ltd.</li> </ol>	
<b>Course Outcomes:</b>	<p>At the end of the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Remember different emerging technologies</li> <li>2. Define emerging trends in Computer Science</li> <li>3. Select appropriate technology for a given task</li> <li>4. Identify necessary inputs for applications of emerging technologies</li> </ol>	



**Name of the Programme** : B.Sc. Computer Science  
**Course Code** : CSC-132  
**Title of the Course** : Computer Applications  
**Number of Credits** : 3T  
**Effective from AY** : 2023-24

<b>Pre-requisites for the Course:</b>	Nil	
<b>Course Objectives:</b>	1. To provide an understanding of essential Information Technology concepts 2. To familiarize and learn use of various types of IT tools	
<b>Content:</b>		<b>No. of Hours</b>
	<b>Unit 1: (Computer Basics)</b> Introduction to computers – Definition, Characteristics, Classification of computers, Components of a Computer System –Hardware Components - Central Processing Unit, Input devices, Output devices, Computer Memory. Categories of Software - System Software and Application Software, Operating Systems - definition and functions. Data - Definition, Types, Data Representation, Types of Number system- Binary, Octal, Hexadecimal Conversion between number bases	<b>8</b>
	<b>Unit 2: (Word Processor)</b> Word processing concepts: Use of Templates, Working with word document: Editing text, Find and replace text. Formatting- Text, Paragraphs, Styles, Columns. Bullets and numbering, Tabs, Indent, Page Formatting. Design Themes, Page Background. Page setup Insert: Tables, Illustrations, Links, Comments, Header and Footer, Symbols. Tables: Inserting, filling and formatting a table, Changing cell width and height, Alignment of Text in cell, Delete / Insertion of Row, Column and Merging & Splitting of Cells, Border and Shading. Referencing- Captions, Footnotes and Endnotes Citations and Bibliography, Reference Tables and Indexes, Bookmarks and Cross-References.	<b>10</b>
<b>Unit 3: Spreadsheets</b> Spreadsheet concepts: Managing worksheets; Formatting, Conditional formatting, Entering data, Editing, Handling operators in formula, Project involving multiple spreadsheets, Organizing Charts and graphs, Generally used Spreadsheet functions: Mathematical, Statistical, Financial, Logical, Date and Time, Lookup and reference, Database, and Text functions, Summarizing data using filter. Pivot tables to analyze data. Using What-If Scenario Manager, Goal Seek. Printing a worksheet-working with page breaks, adding headers	<b>10</b>	



	or footers, choosing what to print.	
	<p><b>Unit 4: Presentation Software</b></p> <p>Creating a presentation, creating a Presentation Using a Template, Creating a Blank Presentation, Inserting &amp; Editing Text on Slides, Inserting and Deleting Slides in a Presentation, Saving a Presentation, Manipulating Slides, Inserting Table, Adding ClipArt Pictures, Inserting Other Objects, Resizing and Scaling an Object, Creating &amp; using Master Slide, Presentation of Slides, Choosing a Set Up for Presentation, Running a Slide Show, Transition and Slide Timings, Automating a Slide Show, Providing Aesthetics to Slides &amp; Printing, Enhancing Text Presentation, Working with Color and Line Style, Adding Movie and Sound, Adding Headers, Footers and Notes, Printing Slides and Handouts.</p>	<b>10</b>
	<p><b>Unit 5: User Generated Content</b></p> <p>Blogs and Wikis. Online Data Capture Tools: Types of data capture form templates (Personal, Work and Education). Question Formats for data capture (short answer, paragraph, multiple choice, check- box, drop-down, linear-scale, multiple choice grid). Data form design (Add new question, add section, add title/description/image/video). Data form distribution techniques (Send via email, publish on social media, send as link). Response management (Print responses, Export to spreadsheet, View analysis, Include analysis in word processing reports)</p>	<b>7</b>
<b>Pedagogy:</b>	PowerPoint, Tutorials	
<b>References/ Readings:</b>	<p>Main Reading:</p> <ol style="list-style-type: none"> <li>1. Dennis Curtin, Kim Foley, Kunal Sen, Cathy Morin(2017), "<i>Information Technology The breaking wave</i>", Indian Edition, McGraw-hillEducation</li> </ol> <p>Additional Reading:</p> <ol style="list-style-type: none"> <li>1. ITL Education Solutions Limited(2012), "<i>Introduction to Information Technology</i>", second edition, Pearson Education India.</li> <li>2. Satish Jain, Shashank Jain, Shashi Singh &amp; M. Geetha Iyer (2010), "<i>O Level made simple Introduction to ICT resources</i>", BPB publication.</li> <li>3. Pradeep K. Sinha and Priti Sinha(2004), "<i>Computer fundamentals</i>", 4<sup>th</sup> Edition, BPB publications</li> </ol>	
<b>Course Outcomes:</b>	<p>At the end of the course the learner will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the essential of Information Technology Concepts</li> <li>2. Develop practical skills in data capture, analysis and presentation, report formatting</li> <li>3. Use a range of current, standard, Office Productivity software applications</li> <li>4. Apply the basic concepts of a word processing package, electronic spreadsheet and PowerPoint tool</li> </ol>	

### C. Digital & Technological Solutions

Name of the Programme: UG General Education Programmes

Course Code: VAC-110

Title of the Course: Awareness of Cyber Crimes and Security

Number of Credits: 02

Effective from AY: 2023-24

<p><b>Pre-requisites for the Course</b></p>	<p>Nil</p>	
<p><b>Course Objectives:</b></p>	<p>This course is intended to:</p> <ul style="list-style-type: none"> <li>• Introduce to students the awareness of cybercrimes and cyber security – concepts, theory.</li> <li>• Covers various techniques which enable the student to analyse the threats and attacks due to cybercrimes.</li> <li>• Explains mitigation techniques and policies for cyber security.</li> </ul>	
<p><b>Content:</b></p>	<p><b>Unit 1: Cyber Crime against Individuals and Organisations</b>            Cyber Crime- Overview, Internal and External Attacks, Attack Vectors. Cybercrimes against Individuals – E-mail spoofing and online frauds, Phishing and its forms, Spamming, Cyber-defamation, Cyberstalking, Cyber Bullying and harassment, Computer Sabotage, Pornographic offenses, Password Sniffing.            Keyloggers and Screen loggers. Cyber Crimes against Women and Children.</p> <p>Cybercrime against organization – Unauthorized access of computer, Password Sniffing, Denial-of-service (DOS) attack, Backdoors and Malwares and its types, E-mail Bombing, Salami Attack, Software Piracy, Industrial Espionage, Intruder attacks. Security policies violations, Crimes related to Social Media, ATM, Online and Banking Frauds. Intellectual Property Frauds. Cyber Crimes against Women and Children.</p>	<p>15 hours</p>
	<p><b>Unit 2: Global perspective on Cyber crimes and Cyber Security</b>            A global perspective on cybercrimes, Phases of cyber-attack – Reconnaissance, Passive Attacks, Active Attacks, Scanning, Gaining Access, Maintaining Access, Lateral movement and Covering Tracks. Detection Avoidance, Types of Attack vectors, Zero-day attack, Overview of Network based attacks.</p> <p>Introduction to Cyber Security. Confidentiality, Integrity and Availability – Triad. Attacks: Threats, Vulnerabilities and Risk. Risk Management, Risk Assessment and Analysis. Information Classification, Policies, Standards, Procedure and Guidelines. Controls: Physical, Logical and Administrative; Security Frameworks, Defence in-depth: Layers of security. Identification and Authentication – Factors. Authorization and Access Controls- Models, Methods and Types of Access Control.</p>	<p>15 hours</p>
<p><b>Pedagogy:</b></p>	<p>Lectures/Tutorial</p>	
<p><b>References/ Readings:</b></p>	<ol style="list-style-type: none"> <li>1. Godbole Nina and Belapore Sunit; “Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives”, Wiley Publications,2011.</li> <li>2. Jain Atul; “Cyber Crime: Issues, Threats and Management”, 2004</li> </ol>	

	<ol style="list-style-type: none"> <li>3. Yar Majid; "Cybercrime and Society", Sage Publications, 2006</li> <li>4. Whiteman Michael E and Mattord Herbert J; "Principles of Information Security", Vikas Publishing House, New Delhi, 2003.</li> <li>5. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002.</li> <li>6. Indian Institute of Banking &amp; Finance <i>Prevention Of Cyber Crimes And Fraud Management</i> Macmillan, Delhi, 2020</li> <li>7. Prashant Mali <i>Cyber Law &amp; Cyber Crimes Simplified</i>, Cyberinfo Media, Delhi, 2017</li> <li>8. Vishwanath Paranjape <i>Cyber Crimes and Law</i>, Central Law Agency, Allahabad, 2019</li> </ol>
<p><b>Course Outcomes</b></p>	<p>Students will,</p> <ul style="list-style-type: none"> <li>• Aware of the various cybercrimes and will able to guide others.</li> <li>• Understand the global problems faced by individuals, organisations due to cybercrimes and attacks.</li> <li>• Apply the cyber security analysis to mitigate and prevent such attacks.</li> </ul>