Name of the Programme: Bachelor of Computer Applications
Course Code: CSC-131
Title of the Course: E-Commerce
Number of Credits: 3T
Effective from AY: 2023-24

Pre-requisite for the Course:	Nil
Course Objectives:	1. To give fundamental understanding of e-commerce 2. To instill idea of convergence of business relationship through technologies. 3. To understand the application of e-commerce in B2B and B2C modal. 4. To identify, define and differentiate the various modes and risks of electronic commerce.

Units	Content	No of hours 45
1	**Introduction to Electronic Commerce** Meaning, Nature and scope of e-commerce,History of e-commerce, Business applications of e-commerce, E-Commerce Models:-(B2B,B2C,C2C,B2G), Advantages and Disadvantages of e-commerce, Applications of M-Commerce	5 hours
2	**E-Commerce Web-sites** Websites as marketplace, Role of website in B2C e-commerce, Website design principles, Alternative methods of customer communication such as e-mail, Email etiquette and e-mail security	5 hours
3	**Online Marketing** Online marketing and advertising, Push and pull approaches, Web counters, Web advertisements, Content marketing, Need of Digital Marketing for an e-commerce Business, Search Engine Optimization(SEO), Search Engine Marketing(SEM), Social Media Marketing(SMM), Web Analytics	10 hours
4	**Applications of E-commerce** Applications of e-commerce to Supply chain management Applications of e-commerce to Customer Relationship Management, Product and service digitization, Remote servicing	5 hours
5	**Business to Consumer E-Commerce** Cataloguing,Order planning and order generation,Cost estimation and pricing,Order receipt and accounting,Order selection and prioritization,Order scheduling,Order fulfilling,Order delivery,Order billing,Post sales service	4 hours
6	**Business to Business E-Commerce** Need and Models of B2B e-commerce,Using public and private computer networks for B2B trading; EDI and paperless trading,	7 hours

		Characteristic features of EDI service arrangement, EDI architecture and standards	
7		**Electronic Payment System** Types of payment systems, credit cards, debit cards, mobile, etc, Electronic Fund Transfer(EFT), Operational credit and legal risk of e-payment, Risk management options for e-payment systems	5 hours
8		**Security Issues in E-Commerce** Risks of e-commerce,Types and sources of threats; Security tools, Risk management approaches	4 hours
Pedagogy:		**Suggested strategies for use to accelerate the attainment of the various course outcomes.** 10. Lecture method need not be only a traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes. You may use a. Video/Animation to explain various concepts. b. Collaborative, Peer, Flipped Learning etc. 11. Ask at least three HOT (Higher-Order Thinking) questions in the class, which promotes critical thinking. 12. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyse information rather than simply recall it. 13. Introduce Topics in manifold representations. 14. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them. 15. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding 16. To promote self-learning give atleast one assignment (equivalent to 50% assignment weightage) where they can complete atleast one MOOCs (certificate or equivalent) course out of lecture hour. Test their understanding through quizzes or presentations.	
References/ **Readings:**		Reference Books: 1. P. T. Joseph, E-Commerce: An Indian Perspective Paperback, PHI Learning, 5th Edition, 2015 2. V. Rajaraman, Essentials of E-Commerce Technology, PHI Learning, 2015 Revised Edition 3. Kalakota, Ravi and Andrew.Whinston, Frontiers of Electronic Commerce, Pearson Education, 2015 Revised Edition 4. Kamlesh N. Agarwala, Amit Lal and Deeksha Agarwala, Business on the Net: An Introduction to the Whats and Hows of E Commerce, Macmillan India Ltd, 2000 5. Diwan, Pragand Sunil Sharma, Electronic Commerce- A Manager's Guide to E Business,Vanity Books International, Delhi.	

	6. Fitzgerald, Business Data Communication Network, McGrawHill, 1998. 7. Dishek J. Mankad,Understanding Digital Marketing: Strategies for online success, 2019 8. NPTELResources: https://nptel.ac.in/content/storage2/courses/106108103/pdf/PPTs/mod13.pdf
Course Outcomes:	On completion of the course students will be able to 1. Understand the foundation of e-commerce and e-commerce websites. 2. Explain the basics of online marketing and e-commerce applications. 3. Compare B2B and B2C e-commerce models. 4. Explain electronic payment system, the security issues, and security mechanism in e-commerce applications.

Name of the Programme: Bachelor of Commerce (Honors)
Course Code: COM-146   Title of the Course: Business Data Processing and Networking
Number of Credits: 03 (1T+2P)
Effective from AY: 2023-24

Pre-requisites for the Course:	Nil	
Course Objectives:	Objectives of the Course are: 1. To develop practical skills in data analytics. 2. To provide knowledge of data processing, data analysis and e-commerce. 3. To provide knowledge of computer networking.	
Content:	**Unit 1: Data Processing and Data Analysis** Organization/sources of data, Importance of data quality, Dealing with missing or incomplete data, Data Classification; Data Processing – Steps involved in data processing, advantages of computers in data processing; Data analysis and forecasting - importance of data analysis in business, Data forecasting, its need, benefits of data forecasting, Data Integration: concept and how it works	4 hours
	Unit 2: E-Commerce Definition, E-commerce and Trade Cycle, Electronic Markets, Electronic Data Interchange and Internet Commerce, Types of E-commerce: Business to Business E-Commerce, Business to Consumer E-Commerce. Consumer to Consumer, Government to Consumer, Business to Government, Electronic Payment Systems: Smart Cards – Credit Cards – Wallets, Safe practices, Risks, E-Retail, Concept and Examples, Online shopping – Introduction, Safety measures (Encryption of data authentication, SSL, Digital signatures, Digital Certificates), E-Banking, Features and services, M-Commerce, Products and services	5 hours
	Unit 3: Basics of Computer Networking Networking basics, Need for computer networks, Types of networks- LAN, MAN, WAN, Network Components – H/W, Software, Communication channels, Network Devices, Network topologies.	6 hours
	Practicals **Lab 1** Spreadsheet (MS-Excel or any similar open source software) - Working with worksheets -Entering data, Formatting, Editing, and Printing a worksheet, - Formulas and Functions in Excel, operators in formula - Generally used Spreadsheet functions - Mathematical, Statistical, Financial, Logical, Date and Time, Database and Text functions - Introduction to some more useful functions such as the IF, nested IF, VLOOKUP and HLOOKUP - Data Sorting and Filtering - Result representation of data using spreadsheet - What-if analysis, Logical tests (nested if functions), Goal seek,	36 hours

	- Representing results graphically - Filtering, advanced filters, sorting and conditional formatting data - Data validation techniques, Hyperlinks - Pivot table, Scenarios - Summing through the sheets - Getting external data files into Excel - Macros - creation, editing and deletion of macros	
	Lab 2 Data Analytics - Assignments to analyse data available from Kaggle.com such as Analysis of demographic data, environment data, public expenditure using open source softwares. - Analyse data from annual reports of Companies and banks	**8 Hours**
	Lab 3 E-commerce Website review Write a review of an E-Commerce Site visited include: Site description, Site Design, ease in navigation , process for purchasing items, security, privacy, customer service, best features of site, Target Audience, Revenue model, Marketing Strategies	**8 Hours**
	Lab 4 Computer Networking Basic Networking Setup of PC, Network commands like ipconfig, ping, traceroute, nslookup etc, Setup of Home Router / Wifi Hotspot, Understanding of Firewall and Basic Firewall Setup, File and Printer Sharing, connecting to share, Finding out public address, connection speeds etc.	**8 Hours**
Pedagogy:	Lectures, Discussions, Presentations, Case Studies, Assignments, Class Activities	
Reference/ Readings:	1. Leon, A., & Leon, M., (1999), Fundamentals of Information Technology (First ed.), Leon Press 2. Kalakota, R., & Whinston, A.B., (2009), Frontiers of Electronic Commerce (Ninth ed.) , Pearson Education 3. Whiteley, D., (2000), E-Commerce: Strategy, Technologies And Applications (First ed.), Tata McGraw-Hill Education 4. Mathew, R. ,(2020), Business Analytics for Decision Making, (First ed.), Pearson Education 5. Vaudenay, S., (2011), A Classical Introduction to Cryptography, (First ed.), Springer 6. https://www.analyticsvidhya.com/blog/2021/11/a-comprehensive-guide-on-microsoft-excel-for-data-analysis/ 7. https://www.tutorialspoint.com/excel_data_analysis/excel_data_analysis_tutorial.pdf	
Course Outcomes:	After completion of this course, the learners will be able to: **CO 1:** Explain the concepts of data processing and data analysis and its applications in business **CO 2:** Elaborate the concepts of computer networking and e-commerce technology and its applications in business. **CO 3:** Develop skills of data analysis using relevant Application software. **CO 4:** Apply the Spreadsheet tools to solve business problems.	

Name of the Programme: Bachelor of Commerce (Honors)
Course Code: COM-141   Title of the Course: Computer Applications in Business
Number of Credits: 03 (1T+2P)
Effective from AY: 2023-24

Pre-requisites for the Course:	Nil
Course Objectives:	Objectives of the Course are: 1. To provide skills in data capturing, presentation, and report formatting. 2. To provide an understanding of essentials of Information Technology, Internet Applications and Emerging Technologies. 3. To develop skills in efficient search techniques and online collaboration tools.	

Content:	**Unit 1: Information Technology Basics** Information: Prerequisites of Information, Need for Information Technology and its advantages; Information Technology : Definition and components; Data : Definition, Types, Data Representation, Number system and Coding Schemes(ASCII and UNICODE); Parts of a Computer: CPU, Memory, Input/ Output Devices, Auxiliary Memory; Software – Definition, Relationship between Hardware and Software, Categories of Software, OS - definition & functions Role of Information Technology in : Business, Mobile Computing, Health Services, Public Sector, Media, Defence Services, Education and Publication.	**10 hours**
	Unit 2: Internet Applications and Emerging Technologies Internet – role and importance, Web Browser, IP Addressing – Public Vs Private, Static Vs Dynamic; WWW & related protocols; Internet Applications. Cloud Computing: Meaning, Features, & Service models, Advantages and disadvantages, Mobile Computing: Meaning, Business Applications of Mobile computing, Virtual reality & Augmented Reality: Meaning and applications, IoT - Internet of Things: Meaning & Applications	**5 hours**
	Unit 3: Practicals **Lab 1** Basic Computer Skills Surfing the Internet, Use of Email and Search Engines Securing your device Installation and Configuration of any free Antivirus Package eg. AVG/Avast etc., Online Sharing and Collaboration Create documents, spreadsheets and presentations online, Share and collaborate in real time, Safely store and organize your work, Control who can see your documents Data capture using Google Forms Create data forms to capture data for Event Registration, Event Feedback, Customer feedback/satisfaction on a product or service and Order Request OS Basic Installation of Operating System , Demonstrate features of any MS	**10 hours**

	Windows based OS or any of the Linux flavor , Identification of Directories , Setting up computer, Add a printer, Check device drivers, Installation of software, Users and administrative rights for installation **Lab 2** Report Formatting using Word Processing (MS Word or any similar Open Source software) Draft an official letter for job interview invitation/ job appointment/ invitation to a business trade show event, use mail merge to input the recipients list linking with database. Given a project report in PDF format transfer to word processor software and format to include title page, specified Paragraph and Page Formating (page size, orientation, line spacing, font type and font size, Indent, bullets, paragraph formatting) details, Acknowledgement page, Table of contents page, List of figures page, List of Tables page, bibliography, references, distinct headers for each chapter, page numbering in roman for initial pages and normal from first chapter. The document should be checked for spelling errors and corrected appropriately. Create / Upload a document in a collaboration software like Google docs. Share and collaborate in real time, Safely store and organize your work, Control who can see your documents. **Lab 3** Presentation Software (MS- Powerpoint or any similar Open Source software) Preparing presentation in areas such as Customer satisfaction/ feedback, product analysis, job satisfaction using the data obtained through data capture tool, including appropriate slide animation, sound recording, slide timings, customer feedback video. Export the presentation as video or save as slide show. Prepare handouts for audience.	**30 hours** **20 hours**
Pedagogy:	Lectures, Practical Lab Sessions, Presentations	
Reference/ Readings:	1. Sinha, P. K., & Sinha, P. (2014), Computer Fundamentals (Sixth ed.), BPB Publications 2. Leon, A., & Leon, M. (1999), Fundamentals of Information Technology (First ed.), Leon Press 3. Arvind Babu, M. C., Anandamurugan, S., & Priyaa, T. (2016), Cloud Computing (First ed.), Laxmi Publications Pvt Ltd 4. Bahga, A., & Madisetti, V. (2015), Internet of Things: A Hands-On Approach, (First ed.), University Press 5. https://www.howstuffworks .com 6. https://www.panola.edu/media/825/download?attachment/ itsw1401.pdf	
Course Outcomes:	After completion of this course, the learners will be able to: **CO 1:** Explain the concepts of Information Technology. **CO 2:** Discuss significance and applications of Internet Applications. **CO 3:** Discuss significance and applications of Emerging Technologies. **CO 4:** Demonstrate practical skills in Application software.	

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

Pre-requisites for the Course	Nil
Course Objectives:	This course is intended to: • Introduce to students the awareness of cybercrimes and cyber security – concepts, theory. • Covers various techniques which enable the student to analyse the threats and attacks due to cybercrimes. • Explains mitigation techniques and policies for cyber security.

Content:	**Unit 1: Cyber Crime against Individuals and Organisations** 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. 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.	15 hours
	Unit 2: Global perspective on Cyber crimes and Cyber Security 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. 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.	15 hours
Pedagogy:	Lectures/Tutorial	
References/ Readings:	1. Godbole Nina and Belapore Sunit; "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley Publications,2011. 2. Jain Atul; "Cyber Crime: Issues, Threats and Management", 2004	

	3. Yar Majid; "Cybercrime and Society", Sage Publications, 2006 4. Whiteman Michael E and Mattord Herbert J; "Principles of Information Security", Vikas Publishing House, New Delhi, 2003. 5. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002. 6. Indian Institute of Banking & Finance *Prevention Of Cyber Crimes And Fraud Management* Macmillan, Delhi, 2020 7. Prashant Mali *Cyber Law & Cyber Crimes Simplified,* Cyberinfo Media, Delhi, 2017 8. Vishwanath Paranjape *Cyber Crimes and Law*, Central Law Agency, Allahabad, 2019
Course Outcomes	Students will, • Aware of the various cybercrimes and will able to guide others. • Understand the global problems faced by individuals, organisations due to cybercrimes and attacks. • Apply the cyber security analysis to mitigate and prevent such attacks.

Name of the Programme: Bachelor of Science in Computer Science (Honours)
Course Code: CSC-131
Title of the Course: Emerging Trends in Computer
Number of Credits: 3T
Effective from AY: 2023-24

Pre-requisites for the Course:	NIL	
Course Objectives:	This course will 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. It will also prepare the students to use technology in their respective professional preparations.	
Content:	**Unit 1 : Artificial Intelligence** 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	8 hours
	Unit 2 : Business Intelligence (BI) and Big data 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	10 hours
	Unit 3 : Internet of Things (IoT) and Embedded Systems 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, IoTenabling technologies, IoT levels and deployment templates, Applications in IoT	12 hours
	Unit 4 : Cloud Computing 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 Computing Reference Model, Cloud System Architecture, Cloud Deployment Models	8 hours

	Unit 5: Blockchain and Cryptocurrency 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, Bitcoin –Digital Signatures as Identities – eWallets – Personal Crypto security - Bitcoin Mining	7 hours
Pedagogy:	PowerPoint, YouTube Videos	
References/ Readings:	1. Artificial Intelligence: A Modern Approach, Stuart Russel and Peter Norvig, Pearson 3 rd 2015 2. Big Data Analytics, RadhaShankarmani, M Vijayalakshmi, Second Edition, 2017, WileyBig Data and Hadoop, V.K Jain Khanna Publishing, First 2018 3. Getting Started with the Internet of Things, Cuno Pfister O"Reilly Sixth 2018 4. Internet of Things: A Hands-On Approach by Arsheep Bahga 5. Cloud Computing by Anandamurugan, T.Priyaa et al 6. Blockchain for Beginners: The Art of Decentralisation & Cryptography, Tejaswini N and Yathish R	
e-Resources and other Digital Material	1. https://nptel.ac.in/courses/106/104/106104189/ 2. https://www.coursera.org/specializations/big-data 3. https://www.edx.org/course/big-data-fundamentals 4. https://www.edx.org/course/artificial-intelligence-ai 5. https://www.udemy.com/course/artificial-intelligence-az	
Course Outcomes:	At the end of the course, students will be able to: 1. Identify different emerging technologies 2. Select appropriate technology for a given task 3. Identify necessary inputs for applications of emerging technologies 4. Define emerging trends in Computer Science	

Name of the Programme: Bachelor of Science in Computer Science (Honours)
Course Code: CSC-133
Title of the Course: Cyber Security Essentials
Number of Credits: 03
Effective from AY: 2023-24

Pre-requisites for the Course:	The student should have basic knowledge on how to use computers and internet technology.	
Course Objectives:	- To introduce principles of cyber security and have an understanding on the cyber-crimes taking place. - To have an understanding of the existing legal framework and laws on cyber security. - To enable students to adopt safe practices when using social media platforms and digital payment systems.	
Content:	1. **Introduction to Cyber security** Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace, Communication and web technology, Internet, World Wide Web, Advent of internet, Internet infrastructure for data transfer and governance,Internet society,Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security.	5 hours
	2. **Cyber crime and Cyber law** Classification of cyber-crimes, Common cyber-crimes, cyber-crime targeting computers and mobiles, cyber-crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, Cybercriminals modus-operandi, reporting of cyber-crimes, Remedial and mitigation measures, Legal perspective of cyber-crime, IT Act 2000 and its amendments, Cyber-crime and offences, Organisations dealing with Cyber-crime and Cyber security in India, Case studies.	10 hours
	3. **Social Media Overview and Security** Introduction to Social networks. Types of Socialmedia, Social media platforms, Social media monitoring, Hashtag, Viralcontent, Social media marketing, Social media privacy, Challenges, Opportunities and pitfalls in online social network, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content,Best practices for the use of Social media,Case studies.	10 hours

	4. E-Commerce and Digital Payments Definition of E- Commerce, Main components of E-Commerce, Elements of E-Commerce security, E-Commerce threats, E-Commerce security best practices, Introduction to digital payments,Components of digital payment and stakeholders, Modes of digital payments- BankingCards, Unified Payment Interface (UPI),e-Wallets, Unstructured SupplementaryService Data (USSD), Aadhar enabled payments, Digital payments related common frauds and preventive measures.RBI guidelines on digital payments and customer protection in unauthorised banking transactions. Relevant provisions ofPayment Settlement Act,2007.	10 hours
	5. Digital Devices Security, Tools and Technologies for Cyber Security End Point device and Mobile phone security, Password policy, Security patch management, Data backup, Downloading and management of third-party software, Device security policy, Cyber Security best practices, Significance of host firewall and Ant-virus, Management of host firewall andAnti-virus, Wi-Fi security, Configuration of basic security policy and permissions.	10 hours
Pedagogy:	Lecture method, Case Studies, Hands-on Training, Group Discussions	
References/ Readings:	1. Cyber Crime Impact in the New Millennium, by R. C Mishra, Author Press. Edition 2010. 2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sunit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011) 3. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson, 13th November, 2001) 4. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd. 5. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers. 6. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd. 7. Fundamentals of Network Security by E. Maiwald, McGraw Hill.	
Course Outcomes:	At the end of the course, learner will be able to: 1. Explain the concept of Cyber security and issues and challenges associated with it. 2. Explain the cyber crimes, their nature, legal remedies and as to how to report the crimes through available platforms and procedures. 3. Explain various privacy and security concerns on online social media and the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms. 4. Explain the basic concepts related to E-Commerce and digital payments, digital payment modes and related cyber security aspects, RBI guidelines and preventive measures against digital payment frauds.	