

## BCA3601: Management Information System

### Course Objective:

1. To understand the concept if Information Systems.
2. To learn the terminology used in the field of IT and how IT principles can apply to businesses.
3. To understand the types of Information Systems e.g., e-commerce, Enterprise Resource Planning (ERP), Decision Support Systems (DSS), Artificial Intelligence (AI) and Expert Systems (ES), SCM, CRM etc.

**Learning Outcome:** After successful completion of this course, the students would be able to:

1. Understand basic information system concepts as applied to business operations and management.
2. Identify the major components of a computer system, including hardware, software, operating systems and operating environments as they apply to information systems.
3. Understand how to utilize large-scale computer applications systems to assist with business management and operations.

### Course Contents:

Module	Course Topics	Total	Credits
I	<b>An Overview of Information System:</b> Information System Concepts: Introduction, Data vs. Information, The Characteristics of Valuable Information, The Value of Information, Types of Information; System and Modeling Concepts: System Components and Concepts, System Performance and Standards, System Variables and Parameters; Elements of Information System, Types of Information System: Manual and Computerized Information System, Computer-Based Information System; Information System Classification: Operations Support Systems, Management Support Systems.	8 Hours	1
II	<b>Concepts of Management &amp; Organization Theory and IS Technology:</b> Levels of management; Hierarchy of management activity; Different types of decisions; Information requirements by level of management; Types of Computer-Based Information System: Office Automation System (OAS), Transaction Processing System (TPS), Management Information System(MIS), Decision Support System (DSS), Executive Information System (EIS), Artificial Intelligence and Expert Systems Information System Technology & Implementation The Evolution of Information System Technology; Computer Hardware (Input, Processing, Storage & Output H/W); Computer Software (System Software, Application Software);	8 Hours	1

	Horizontal Market Application Software; Vertical Market Application Software; Custom- Developed Application Software		
<b>III</b>	<b>Management and Decision Support System:</b> An Overview of Management Information Systems: Inputs & Output to a Management Information System, Characteristics of a Management Information System; Functional Aspects of the MIS: Financial Management Information Systems, Manufacturing Management Information Systems, Marketing Management Information Systems, Human Resource Management Information Systems, An Overview of Decision Support Systems: Characteristics of a Decision Support System, Capabilities of a Decision Support System, A Comparison of DSS and MIS; Components of a Decision Support System: The Database	8 Hours	1
<b>IV</b>	<b>Business Applications of Information System:</b> Introduction to Electronic Commerce: Business-to-Business (B2B) E-Commerce, Business-to-Consumer (B2C) E-Commerce, Consumer-to-Consumer (C2C), E-Commerce; E-Commerce Challenges; Electronic Commerce Applications; Business Application Tools: Enterprise Resource Planning, Advantages and Disadvantages of ERP Systems, Production and Supply Chain Management, Procurement Management, Customer Relationship Management and Sales Ordering.	8 Hours	1

### **Suggested Readings:**

1. Ralph M. Stair & George W. Reynolds - Principles of Information System: A Managerial Approach; Course Technology
2. Laudon and Laudon - Management Information Systems; Pearson Education.
3. Jawadekar - Management Information Systems; Tata McGraw-Hill.
4. Davis and Olson, "Management Information Systems; Tata McGraw-Hill.
5. O'Brien - Management Information Systems; Tata McGraw-Hill.
6. D. P. Goel - Management Information System; Macmillan

## BCA3602: Advance Computer Technologies

### Course Objective:

1. To present fundamentals of advance technologies.
2. To cover advanced aspects of computing processes and techniques especially relevant to those likely to participate in or manage vast amount of data.

**Learning Outcome:** Students who have successfully completed this course will have full understanding of the following concepts:

1. Develop the understanding of Data Science and its stream uses.
2. Develop the understanding of data compilation.
3. Understanding of latest technologies which is revolting computer world.

### Course Contents:

Module	Course Topics	Total Hours	Credits
I	<b>Introduction of Data Science :</b> History of Data Science ,involvement of Data Science, Era of Data Science, Business Intelligence vs Data Science, Life cycle of Data Science, Tools of Data Science Data Extraction, Wrangling & Exploration, Data Analysis Pipeline, Types of Data: Raw and Processed Data, Data Wrangling, Exploratory Data Analysis <b>Visualization of Data:</b> Introduction to Visualization. Human Perception and Information Processing, Data types: Graphical perception (the ability of viewers to interpret visual (graphical) encodings of information and thereby decode information in graphs, Color for information display, Color management systems, Picture visualization and fruition Data Transformation into sources of knowledge through visual representation, Requirements and heuristics for high-quality visualizations, Charts and standard views: relevance and appropriateness, Advanced and innovative tools for data visualization and advanced quantitative analysis, The evaluation of the quality of visualizations and info graphics.	8 Hours	1
II	<b>Introduction of Big Data Analytics:</b> Evolution of Big data- Best Practices for Big data Analytics- Big data characteristics - Big Data Use Cases- Characteristics of Big Data Applications- Big Data Modelling- Hadoop Eco system. An Overview of Clustering- K-means clustering- Use Cases - Determining the Number of Clusters- Classification- Decision Trees- Decision Tree Algorithms- Evaluating a Decision Tree- Decision Trees in R- Bayes Theorem- Naive Bayes Classifier	8 Hours	1

III	<p><b>Hadoop:</b> Data Storage File System Abstraction Big Data and Distributed File Systems Hadoop Distributed File System (HDFS) HDFS Architecture, Architectural assumptions and goals.</p> <p>Data is stored and read in HDFS, Namenodes and Data nodes Blocks, Data Replication, Fault Tolerance, Data Integrity Namespaces, and Federation in Hadoop 2.0, High Availability in Hadoop 2.0, Security and Encryption, HDFS Interfaces: Filesystem API, FSShell, WebHDFS, Fuse etc.</p> <p><b>Data Processing:</b> MapReduce, The fundamentals: map () and reduce(), Data Locality Architecture of the MapReduce framework.</p> <p><b>Data Integration:</b> Integrating Hadoop into your existing enterprise, Introduction to Sqoop.</p>	8 Hours	1
IV	<p><b>Introduction of Blockchain Technology:</b> Introduction – block chain history, basics, architectures, Types of block chain, Base technologies – dockers, docker compose, and data structures, hashes, micro-services.</p> <p>Bitcoins– Fundamentals, aspects of bitcoins, properties of bitcoins, bitcoin transactions, bitcoin P2P networks, block generation at bitcoins, consensus algorithms.</p> <p>Blockchain hyper ledger– Fabric architecture, implementation, networking, fabric transactions, demonstration, smart contracts.</p> <p>Applications– block chain applications, e governance, smart cities, smart industries, anomaly detections, use cases, trends on block chains, server less blocks, scalability issues, block chain on clouds.</p>	8 Hours	1

### Suggested Readings:

1. Foundations of Data Science by Avrim Blum, John Hopcroft, and Ravindran Kannan.
2. Jure Leskovec, Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2014.
3. Tom White , Hadoop: The Definitive Guide, 4th edition O'Reilly Publications, 2015
4. David Loshin, "Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph", 2013.
5. EMC Education Services, "Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data", Wiley publishers, 2015.
6. Bart Baesens, "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications", Wiley Publishers, 2015.
7. Dietmar Jannach, Markus Zanker, Alexander Felfernig and Gerhard Friedrich "Recommender Systems: An Introduction", Cambridge University Press, 2010.
8. Kim H. Pries and Robert Dunnigan, "Big Data Analytics: A Practical Guide for Managers " CRC Press, 2015.
9. The Definitive Guide by Tom White.
10. MapReduce Design Patterns (Building Effective Algorithms & Analytics for Hadoop) by Donald Miner & Adam Shook
11. Professional Hadoop Solutions by Boris Lublinksy, Kevin Smith, and Alexey Yakubovich.
12. **Web links:** <https://cloudthat.in/course/processing-bigdata-with-apache-hadoop/>
12. Kevin Werbach, The Blockchain and the new architecture of Trust, MIT Press, 2018.

## OE31101: Environmental Issues of IT & e-Waste Management

### Course Objective:

1. The objective of this course is to provide students with an understanding of the role of ICTs and their impact on the global carbon footprint, This includes how to estimate the carbon footprint of the ICT operations of an organization and access ways to reduce the carbon footprint by changes to policies for procurement of ICT, changes to ICT operations and revising business processes.
2. To study about existing green computing strategies, fundamental challenges in achieving green operations of computing units and directions to solve some of them.
3. This course empowers students to reduce the energy use, waste, and other environmental impacts of Information Technology (IT) systems while reducing life cycle costs, thereby improving competitive advantage. Students learn how to measure computer power usage, minimize power usage, procure sustainable hardware, design green data centers, recycle computer equipment, configure computers to minimize power, use virtualization to reduce the number of servers, and other green technologies.

**Learning Outcome:** After successful completion of this course, the students would be able to:

1. Assess enterprise-wide and personal computing and computing related energy consumption.
2. Acquire expertise for improving the energy efficiency of personal computers by reducing the power consumption requirements.
3. Choose the best sustainable hardware for their applications.
4. Evaluate the regulatory and governance issues surrounding IT.
5. Recognize the necessity for long-term sustainability in IT.
6. Formulate plans for reducing IT heating and cooling requirements.
7. Execute a virtualization plan.

### Course Contents:

Module	Course Topics	Total Hours	Credits
I	<b>Politics, Science and Business of Sustainability:</b> The Basics of Green Computing: The Energy Problem, Types of IT Energy Wastes, Reducing Energy Waste, Problem of E-waste; Legal Mandates for Green IT: Regulations in the United States, Regulations in India, Waste Electrical and Electronic Equipment (WEEE).	8 Hours	1
II	<b>Technical Strategy and Planning–Emerging Technology Monitoring:</b> Energy Usage: Energy Problems (Power Supplies), Monitoring Energy Usage, Reducing Energy Usage, Low Power Computers and Components; Cooling: Cooling Costs, Reducing Cooling Costs; Energy Saving Initiatives: The Challenges of Energy Efficiencies, Energy Star, 80Plus Program, Electronic Product	8 Hours	1

	Environmental Assessment Tool (EPEAT); Document Management: The Problem with Paper, Reducing Paper Usage, Electronic Document Management.		
<b>III</b>	<b>IT Asset Disposal (E-Waste Management):</b> WEEE – The scale of the problem; Materials Used in Manufacturing Electrical and Electronic Products; Legislative Influences on Electronic Recycling: Producer Responsibility Legislation, The WEEE Directive, The RoHS Directive; Treatment Option for WEEE; Logistics of WEEE; Barriers to Recycling of WEEE.	8 Hours	1
<b>IV</b>	<b>Business/IS Strategy and Planning:</b> Virtualization: Basics of Virtualization, Types of Virtualization; Improving Data Centre Energy Efficiency: Energy Consumption, Power Requirement of Equipment, Power Requirement for Cooling the Equipment's; Green IT Department: The First Step – 5S, The Seven Wastes, Drawing a Process map.	8 Hours	1

### **Suggested Readings:**

1. Toby J. Velete, Anthony T. Velete, Robert Elsenpeter - Green IT: Reduce Your Information System's Environmental Impact While Adding to the Bottom Line; McGraw-Hill.
2. Lawrence Webber, Michale Wallace - Green Tech: How to plan and Implement Sustainable IT Solutions; AMACOM (American Management Association)
3. R E Hester, R M Harrison – Electronic Waste Management; RSC Publishing
4. John Lamb - The Greening of IT: How Companies Can Make a Difference for the Environment; IBM Press
5. Marty Poniatowski - Foundation of Green IT; Prentice Hall
6. Bhuvan Unhelkar - Green IT Strategies and Applications; CRC Press
7. Carl H. Speshock - Empowering Green Initiatives with IT; John Wiley & Sons, Inc.
8. Bill Tomlinson - Greening through IT; The MIT Press

## OE31102: Digital Governance

### Course Objective:

1. Generating human resources with the right skills, knowledge, and aptitude and leadership qualities for effective implementation of e-Governance Projects.
2. To study about e-Governance models and its characteristics.
3. Conceptualization of ideas and development of service delivery models for improving the quality of service to citizen.
4. To make aware students about scope of e-Governance in the State through various sectors and services.

**Learning Outcomes** On completion of this course students will be able to:

1. Understand and critique the various roles attributable to government.
2. Explore current understandings of the relationship between public services and the rights, entitlements and responsibilities of citizens, clients and stakeholders.
3. Use terms such as 'good governance', 'accountability' and 'consultation' with a Critical understanding of their meaning.

### Course Contents:

Module	Course Topics	Total Hours	Credits
I	<b>Overview of E-Governance and its Models:</b> Introduction to E-Governance: Needs of E-Governance, Issues in E-Governance applications and Digital Divide; Evolution of E-Governance, its scope and content; Present global trends of growth in E-Governance; Evolution in E-Governance and Maturity Models: Five Maturity Levels; Characteristics of Maturity Levels; Key areas; Towards Good Governance through E-Governance Models.	8 Hours	1
II	<b>E-Governance Infrastructure, Strategies:</b> E-readiness: Digital System Infrastructure, Legal Infrastructural Preparedness, Institutional Infrastructural Preparedness, Human Infrastructural Preparedness, Technological Infrastructural Preparedness; Evolutionary Stages in E-Governance;	8 Hours	1
III	<b>Applications of Data Mining in E-Governance:</b> Introduction of Data warehousing and Data mining in E-Governance; National Data Warehouses: Census Data, Prices of Essential Commodities; Other areas for Data Warehousing and Data Mining: Agriculture, Rural Development, Health, Planning, Education, Commerce and Trade, Other Sectors.	8 Hours	1

IV	<b>Case Studies of E-Governance in Indian perspective</b> NICNET-Role of Nationwide Networking in E-Governance <ul style="list-style-type: none"> <li>• Smart Nagarpalika-Computerization of Urban Local Bodies (Municipalities)</li> <li>• Ekal Seva Kendra</li> <li>• Aadhar</li> <li>• E-Suvidha</li> <li>• Bhulekh</li> </ul>	8 Hours	1
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#### **Suggested Readings:**

1. C.S.R. Prabhu, "E-Governance: Concepts and Case Studies", Prentice-Hall of India Private Limited, 2004.
2. N. Gopalsamy, "Information Technology & e-Governance", New Age Publication, First Edition 2009.
3. Backus, Michael, "e-Governance in Developing Countries", IICD Research Brief, No. 1, March 2001.
4. Subhash Bhatnagar, "Unlocking E-Government Potential: Concepts, Cases and Practices