JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech CSE(DS)– III-II Sem	L	T	P	C
	3	0	0	3

(20A32601T) DATA VISUALIZATION
(Professional Elective-III)

Course Objectives:
- Discuss the importance of Data Visualization
- Demonstrate story telling
- Explain the environment of Tableau

Course Outcomes:

After completion of the course, students will be able to
- Effectively present the data
- Draw insights from the data
- Use Tableau

UNIT I   Lecture 9 Hrs

Introduction, The importance of Context, Choosing and effective visual

UNIT II   Lecture 9 Hrs

Clutter is your enemy, Focus your audience's attention, Lessons in Storytelling

UNIT III   Lecture 10 Hrs

Communicating data: A step in the process, a model of communication, Three types of communication problems, six principles of communicating data.
Introduction to Tableau: Using Tableau, Tableau products, Connecting to data.
How much and How many: Communicating how much, communicating how many
Ratios and Rates: Ratios, Rates

UNIT IV   Lecture 10 Hrs

Proportions and Percentages: Part to whole, current to historical, actual to target.
Mean and Median
Variation and Uncertainty: Respecting variation, Variation over time-Control charts, Understanding uncertainty

UNIT V   Lecture 8 Hrs

Multiple Quantities: Scatterplots, Stacked Bars, Regression and Trend Lines, The Quadrant Chart
Changes over time: The origin of time charts, the line chart, the dual axis line chart, the connected scatterplot, the date filed type and seasonality, the timeline, the slopegraph
Maps and Location: One special map, circle maps, filled maps, dual encoded maps.

Textbooks:
1. Cole NussbaumerKnaflic, Storytelling with data, Wiley
2. Ben Jones, Communicating Data with Tableau, O'Reilly

Reference Books:
1. A Julie Steele and Noah Iliinsky, Designing Data Visualizations: Representing Informational Relationships, O'Reilly.
2. Andy Kirk, Data Visualization: A Successful Design Process, PAKT.
3. Scott Murray, Interactive Data Visualization for Web, O'Reilly.

Online Learning Resources:
1. Data Analysis and Visualization Foundations | Coursera
2. Data Visualization | Coursera

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech CSE (IoT)– IV-I Sem

L	T	P	C
3	0	0	3

(20A05705a) CYBER SECURITY
Common to IT, CSE(DS),CSE(IOT)
PROFESSIONAL ELECTIVE - IV

Course Objectives:

The course is designed to provide awareness on different cyber crimes, cyber offenses, tools and methods used in cyber crime.

Course Outcomes:

After completion of the course, students will be able to

- Classify the cyber crimes and understand the Indian ITA 2000
- Analyse the vulnerabilities in any computing system and find the solutions
- Predict the security threats of the future
- Investigate the protection mechanisms
- Design security solutions for organizations

UNIT I   Introduction to Cybercrime   Lecture 8Hrs

Introduction, Cybercrime, and Information Security, Who are Cybercriminals, Classifications of Cybercrimes, And Cybercrime: The legal Perspectives and Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes.

UNIT II   Cyber Offenses: How Criminals Plan Them   Lecture 9Hrs

Introduction, How Criminals plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector, Cloud Computing

UNIT III   Cybercrime: Mobile and Wireless Devices   Lecture 9Hrs

Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies an Measures in Mobile Computing Era, Laptops.

UNIT IV   Tools and Methods Used in Cybercrime   Lecture 8Hrs

Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Keyloggers and Spywares, Virus and Worms, Trojan Horse and Backdoors, Steganography, DoS and DDoS attacks, SQL Injection, Buffer Overflow.

UNIT V   Cyber Security: Organizational Implications   Lecture 8Hrs

Introduction, Cost of Cybercrimes and IPR issues, Web threats for Organizations, Security and Privacy Implications, Social media marketing: Security Risks and Perils for Organizations, Social Computing and the associated challenges for Organizations.

Textbooks:

1. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunil Belapure, Wiley INDIA.

Reference Books:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
2. Introduction to Cyber Security , Chwan-Hwa(john) Wu,J.DavidIrwin.CRC Press T&F Group

Online Learning Resources:

http://nptel.ac.in/courses/106105031/40
http://nptel.ac.in/courses/106105031/39
http://nptel.ac.in/courses/106105031/38

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech CSE (IoT)– IV-I Sem	L	T	P	C
	3	0	0	3

(20A35703b) NDUSTRIAL AND MEDICAL IOT
(PROFESSIONAL ELECTIVE COURSE-V)

Course Objectives:
- To develop knowledge in Industrial Internet of Things (IIoT) fundamentals.
- To gain conceptual understanding of networking and wireless communication protocols used in IIoT deployments.
- To Understand the various Internet of Things (IoT) Protocols like COAP, MQTT.etc
- Introduce how IoT has become a game changer in the new economy where the customers are looking for integrated value.
- Bring the IoT perspective in thinking and building solutions.
- Introduce the tools and techniques that enable IoT solution and Security aspects.

Course Outcomes:
- Develop conceptual design of Medical and Industrial IoT architecture.
- Apply sensors and various protocols for industry standard solutions.
- Articulate privacy and security measures for industry standard solutions.
- Study about Internet of Medical Things (IoMT) and its applications in Healthcare industry.
- Design various applications using IoT in Healthcare Technologies.
- Demonstrate and build the project successfully by hardware/sensor requirements, coding, emulating and testing.

UNIT I Lecture 9 Hrs
Overview of Internet of Things: Introduction, IOT Architecture, Application –based IOT protocols, Cloud Computing, Fog Computing, Sensor Cloud, Big Data.
Overview of Industry 4.0 and Industrial Internet of Things: IIoT- Prerequisites of IIOT, Basics of CPS, CPS and IIOT, Applications of IIoT.

UNIT II Lecture 9 Hrs
Industrial Internet of Things: Introduction, Industrial Internet Systems, Industrial sensing, Industrial sensing, Industrial Processes.
Business Models and Reference Architecture of IIoT: Definition of a business model, Business models of IOT, Business models of IIOT.

UNIT III Lecture 8 Hrs
Key Technologies: Off-site Technologies- Introduction, Cloud Computing- Necessity, Cloud Computing and IIot, Industrial Cloud Platform Providers, SLA, Requirements of Industry 4.0, Fog Computing.
On-site Technologies- Introduction, Augmented Reality- History, Categorization, Applications, Virtual Reality- History, Categorization, Applications.

UNIT IV **Healthcare Technologies** Lecture 8 Hrs
Sensitivity Analysis of Micro Mass Optical MEMS Sensor for Biomedical IoT Devices: Introduction, Modeling and Simulation, Different Shapes of Cantilever, Rectangular-Shaped, Trapezoidal/Triangular-Shaped, Step Profile-Shaped, Results and Discussion.
Enhancing the Performance of Decision Tree Using NSUM Technique for Diabetes Patients: Introduction, Related Work, Mutual Information, Experimental Results and Discussion.
A Novel Framework for Healthcare Monitoring System through Cyber-Physical System: Introduction, Related Work, Framework, Internet of Medical Things (IoMT), Proposed Model, Result and Discussion.

UNIT V   Lecture 10 Hrs

An IoT Model to Improve Cognitive Skills of Student Learning Experience Using Neurosensors: Introduction, Existing Methods, Proposed Method, Result and Discussion.

AdaBoost with Feature Selection Using IoT to Bring the Paths for Somatic Mutations Evaluation in Cancer: Introduction, Existing Models, Methodology.

A Computational Approach to Predict Diabetic Retinopathy Through Data Analytics: Introduction, Methodology, Performance Measures, Tools Used and Results Discussion.

Textbooks:
1. S. Misra, C. Roy, and A. Mukherjee, 2020. *Introduction to Industrial Internet of Things and Industry 4.0.* CRC Press.
2. P. Venkata Krishna, Sasikumar Gurumoorthy, Mohammad S. Obaidat, Internet of Things and Personalized Healthcare Systems.

Reference Books:
1. Pethuru Raj,Abhishek Kumar,Internet of Things Use Cases for the Healthcare Industry,2020.
2. Arun Kumarrana, SharadSharma, Internet of Things Energy, Industry and Healthcare 2021, 1st Edition, CRC Press.

Online Learning Resources:

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech (IoT)– IV-I Sem
           L T P C
           3 0 0 3

(20A52701b) MANAGEMENT SCIENCE
(HUMANITIES ELECTIVE-II)

Course Objectives:
- To provide fundamental knowledge on Management, Administration, Organization & its concepts.
- To make the students understand the role of management in Production
- To impart the concept of HRM in order to have an idea on Recruitment, Selection,Training & Development, job evaluation and Merit rating concepts
- To create awareness on identify Strategic Management areas & the PERT/CPM for better Project Management
- To make the students aware of the contemporary issues in management

Course Outcomes:
- Understand the concepts & principles of management and designs of organization in a practical world
- Apply the knowledge of Work-study principles & Quality Control techniques in industry
- Analyze the concepts of HRM in Recruitment, Selection and Training & Development.
- Evaluate PERT/CPM Techniques for projects of an enterprise and estimate time & cost of project & to analyze the business through SWOT.
- Create Modern technology in management science.

UNITI   INTRODUCTION TO MANAGEMENT
Management - Concept and meaning - Nature-Functions - Management as a Science and Art and both. Schools of Management Thought - Taylor's Scientific Theory-Henry Fayol's principles - Eltan Mayo's Human relations - Systems Theory - **Organisational Designs** - Line organization - Line & Staff Organization - Functional Organization - Matrix Organization - Project Organization - Committee form of Organization - Social responsibilities of Management.

UNIT II   OPERATIONS MANAGEMENT
Principles and Types of Plant Layout - Methods of Production (Job, batch and Mass Production), Work Study - Statistical Quality Control- Deming's contribution to Quality. **Material Management -** Objectives - Inventory-Functions - Types, Inventory Techniques - EOQ-ABC Analysis - Purchase Procedure and Stores Management - **Marketing Management -** Concept - Meaning - Nature-Functions of Marketing - Marketing Mix - Channels of Distribution - Advertisement and Sales Promotion - Marketing Strategies based on Product Life Cycle.

UNIT III HUMAN RESOURCES MANAGEMENT (HRM)
HRM - Definition and Meaning – Nature - Managerial and Operative functions - Evolution of HRM - Job Analysis - Human Resource Planning(HRP) - Employee Recruitment-Sources of Recruitment - Employee Selection - Process and Tests in Employee Selection - Employee Training and Development - On-the- job & Off-the-job training methods - Performance Appraisal Concept - Methods of Performance Appraisal – Placement - Employee Induction - Wage and Salary Administration

UNIT IV STRATEGIC & PROJECT MANAGEMENT

Definition& Meaning - Setting of Vision - Mission - Goals - Corporate Planning Process - Environmental Scanning - Steps in Strategy Formulation and Implementation - SWOT Analysis - **Project Management -** Network Analysis - Programme Evaluation and Review Technique (PERT) - Critical Path Method (CPM) Identifying Critical Path - Probability of Completing the project within given time - Project Cost- Analysis - Project Crashing (Simple problems).

UNIT V CONTEMPORARY ISSUES IN MANAGEMENT

The concept of Management Information System(MIS) - Materials Requirement Planning (MRP) - Customer Relations Management(CRM) - Total Quality Management (TQM) - Six Sigma Concept - Supply Chain Management(SCM) - Enterprise Resource Planning (ERP) - Performance Management - Business Process Outsourcing (BPO) - Business Process Re-engineering and Bench Marking - Balanced Score Card - Knowledge Management.

Textbooks:
1. A.R Aryasri, "Management Science", TMH, 2013
2. Stoner, Freeman, Gilbert, Management, Pearson Education, New Delhi, 2012.

References:
1. Koontz &Weihrich, "Essentials of Management", 6th edition, TMH, 2005.
2. Thomas N.Duening& John M.Ivancevich, "Management Principles and Guidelines", Biztantra.
3. Kanishka Bedi, "Production and Operations Management", Oxford University Press, 2004.
4. Samuel C.Certo, "Modern Management", 9th edition, PHI, 2005

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
B.Tech IV-I Sem

L T P C
3 0 0 3

(20A04704) ELECTRONIC SENSORS
(Open Elective Course –III)

Course Objectives:
- Learn the characterization of sensors.
- Known the working of Electromechanical, Thermal, Magnetic and radiation sensors
- Understand the concepts of Electro analytic and smart sensors
- Able to use sensors in different applications

Course Outcomes:
- Learn about sensor Principle, Classification and Characterization.
- Explore the working of Electromechanical, Thermal, Magnetic, radiation and Electro analytic sensors
- Understand the basic concepts of Smart Sensors
- Design a system with sensors

UNIT I
Sensors / Transducers: Principles, Classification, Parameters, Characteristics, Environmental Parameters (EP), Characterization
Electromechanical Sensors: Introduction, Resistive Potentiometer, Strain Gauge, Resistance Strain Gauge, Semiconductor Strain Gauges -Inductive Sensors: Sensitivity and Linearity of the Sensor – Types-Capacitive Sensors: Electrostatic Transducer, Force/Stress Sensors Using Quartz Resonators, Ultrasonic Sensors

UNIT II
Thermal Sensors: Introduction, Gas thermometric Sensors, Thermal Expansion Type Thermometric Sensors, Acoustic Temperature Sensor ,Dielectric Constant and Refractive Index thermo sensors, Helium Low Temperature Thermometer ,Nuclear Thermometer ,Magnetic Thermometer ,Resistance Change Type Thermometric Sensors, Thermo emf Sensors, Junction Semiconductor Types, Thermal Radiation Sensors, Quartz Crystal Thermoelectric Sensors, NQR Thermometry, Spectroscopic Thermometry, Noise Thermometry, Heat Flux Sensors

UNIT III
Magnetic sensors: Introduction, Sensors and the Principles Behind, Magneto-resistive Sensors, Anisotropic Magneto resistive Sensing, Semiconductor Magneto resistors, Hall Effect and Sensors, Inductance and Eddy Current Sensors, Angular/Rotary Movement Transducers, Synchros.

UNIT IV
Radiation Sensors: Introduction, Basic Characteristics, Types of Photo resistors/ Photo detectors, Xray and Nuclear Radiation Sensors, Fibre Optic Sensors
Electro analytical Sensors: The Electrochemical Cell, The Cell Potential - Standard Hydrogen Electrode (SHE), Liquid Junction and Other Potentials, Polarization, Concentration Polarization, Reference Electrodes, Sensor Electrodes, Electro ceramics in Gas Media.

UNIT V
Smart Sensors: Introduction, Primary Sensors, Excitation, Amplification, Filters, Converters, Compensation, Information Coding/Processing - Data Communication, Standards for Smart Sensor Interface, the Automation Sensors –Applications: Introduction, On-board Automobile Sensors (Automotive Sensors), Home Appliance Sensors, Aerospace Sensors, Sensors for Manufacturing – Sensors for environmental Monitoring

Textbooks:
1. "Sensors and Transducers - D. Patranabis" –PHI Learning Private Limited., 2003.
2. Introduction to sensors- John veteline, aravindraghu, CRC press, 2011

References:
1. Sensors and Actuators, D. Patranabis, 2nd Ed., PHI, 2013.
2. Make sensors: Terokarvinen, kemo, karvinen and villeyvaltokari, 1st edition, maker media,2014.
3. Sensors handbook- Sabriesoloman, 2nd Ed. TMH, 2009

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech IV-I Sem   **L T P C**
                                                                          3 0 0 3

(20A02705) RENEWABLE ENERGY SYSTEMS
(Open Elective Course – IV)

Course Objectives:
- Understand various sources of Energy and the need of Renewable Energy Systems.
- Understand the concepts of Solar Radiation, Wind energy and its applications.
- Analyze solar thermal and solar PV systems
- Understand the concept of geothermal energy and its applications, biomass energy, the concept of Ocean energy and fuel cells.

Course Outcomes:
- Understand various alternate sources of energy for different suitable application requirements
- Understand the concepts of solar energy generation strategies and wind energy system
- Analyze Solar and Wind energy systems
- Understand the basics of Geothermal Energy Systems, various diversified energy scenarios of ocean, biomass and fuel cells

UNIT I   SOLAR ENERGY
Solar radiation - beam and diffuse radiation, solar constant, earth sun angles, attenuation and measurement of solar radiation, local solar time, derived solar angles, sunrise, sunset and day length. flat plate collectors, concentrating collectors, storage of solar energy-thermal storage.

UNIT II   PV ENERGY SYSTEMS
Introduction, The PV effect in crystalline silicon basic principles, the film PV, Other PV technologies, Electrical characteristics of silicon PV cells and modules, PV systems for remote power, Grid connected PV systems.

UNIT III   WIND ENERGY
Principle of wind energy conversion; Basic components of wind energy conversion systems; windmill components, various types and their constructional features; design considerations of horizontal and vertical axis wind machines: analysis of aerodynamic forces acting on wind mill blades and estimation of power output; wind data and site selection considerations.

UNIT IV   GEOTHERMAL ENERGY
Estimation and nature of geothermal energy, geothermal sources and resources like hydrothermal, geo-pressured hot dry rock, magma. Advantages, disadvantages and application of geothermal energy, prospects of geothermal energy in India.

UNIT V   MISCELLANEOUS ENERGY TECHNOLOGIES
Ocean Energy: Tidal Energy-Principle of working, performance and limitations. Wave Energy-Principle of working, performance and limitations.
Bio mass Energy: Biomass conversion technologies, Biogas generation plants, Classification, advantages and disadvantages, constructional details, site selection, digester design consideration
Fuel cell: Principle of working of various types of fuel cells and their working, performance and limitations.

Textbooks:
1. Stephen Peake, "Renewable Energy Power for a Sustainable Future", Oxford International Edition, 2018.
2. G. D. Rai, "Non-Conventional Energy Sources", 4th Edition, Khanna Publishers, 2000.

Reference Books:

1. S. P. Sukhatme, "Solar Energy",3rd Edition, Tata Mc Graw Hill Education Pvt. Ltd, 2008.
2. B H Khan , " Non-Conventional Energy Resources", 2nd Edition, Tata Mc Graw Hill Education Pvt Ltd, 2011.
3. S. Hasan Saeed and D.K.Sharma,"Non-Conventional Energy Resources",3rd Edition, S.K.Kataria& Sons, 2012.
4. G. N. Tiwari and M.K.Ghosal, "Renewable Energy Resource: Basic Principles and Applications", Narosa Publishing House, 2004.

Online Learning Resources:

1. https://nptel.ac.in/courses/103103206
2. https://nptel.ac.in/courses/108108078