



**The Bombay Salesian's Societys**  
**Don Bosco Institute of Technology**  
 (An Autonomous Institute Affiliated to University of Mumbai)  
**Department of Electronics and Telecommunication Engineering**

**Syllabus for IA-1 Examination (Date: 08 to 12 September 2025,  
 Time : 12:30 pm to 1.30 pm, Maximum Marks: 20, Duration : 60 Minutes )**

**BE – SEM VII**


Course Code	Course Name	Faculty Incharge	Syllabus
ECC701	Microwave Engineering	Ms. Freda Carvalho	<p><b>Module 1: Transmission lines</b> - 1.1 Transmission line equations, open and short circuit transmission lines, variation of impedance over length of line, Smith Chart, use of Smith chart in impedance matching, 1.2 planar transmission lines, microstrip line, strip line and coplanar line.</p> <p><b>Module 2:</b> - 2.1 Microwave spectrum and bands, applications of microwaves, types of waveguides, rectangular waveguides, field equations in rectangular waveguide, field components of TM and TE waves for rectangular waveguides, modes of TM and TE waves, cutoff frequency of rectangular waveguide. 2.2 Cavity resonators type of cavity resonators, Rectangular waveguides resonators, resonant frequency and problems.</p>
ECC702	Mobile Communication System	Ms. Aparna Telgote	<p><b>Module1: Fundamentals of Mobile Communication,</b>          1.1 :Introduction to Wireless Communication: Mobile Radio Telephony, Examples of Wireless Communication Systems, 1.2 The Cellular Concept System Design Fundamentals: Frequency reuse, Channel assignment strategies, Interference and system capacity, Trunking and Grade of service, Improving Coverage and Capacity in Cellular System and related problems.</p> <p><b>Module 2: Mobile Radio</b>          2.1 <b>Large scale fading:</b> Free space propagation model, ground reflection (two-ray) model, practical Link budget design using path loss models. Self-learning: Basic propagation mechanisms, reflection, diffraction and scattering.          2.2 <b>Small scale fading:</b> Small-scale multipath propagation, parameters of mobile multipath channels, types of small-scale fading, Rayleigh and Ricean distributions Propagation          2.3 <b>Features of all conventional multiple access techniques:</b> Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Space Spectrum Multiple Access (SSMA), Space Division Multiple Access (SDMA), Orthogonal Frequency Division Multiple Access (OFDMA) OFDM-PAPR</p>
ECCDLO 7023	Internet Communication Engineering	Ms. Aparna Telgote	<p><b>Module 1: Introduction to Internet,</b> 1.1 What is the Internet, Evolution of the Internet, service description, Network protocol? Overview of TCP/IP, layer functions</p> <p><b>Module 2 : Application Layer in the Internet ,</b> Application Layer-Host configuration, DHCP, Domain Name System (DNS), Multicast DNS Remote Login, TELNET and SSH, HTTPS, electronic mail</p> <p><b>Module 3: Internet Security</b>          2.1 <b>Network layer security</b> (AH, ESP, IPsec)          2.2 <b>Transport layer security</b> (SSL), Application layer security (secure E mail-PGP, S/MIME)          2.3 <b>Firewall, Intrusion Detection System.</b></p>

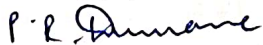
**BE – SEM VII**

Course Code	Course Name	Faculty Incharge	Syllabus
ECCDLO 7014	Big Data Analytics	Ms. Priti Andhale	<p><b>Module 1 :- Introduction to Big Data Analytics</b> 1.1 Introduction to Big Data, Big Data characteristics, Types of Big Data, Traditional vs. Big Data a business approach</p> <p>1.2 Technologies Available for Big Data, Infrastructure for Big Data, Big Data Challenges</p> <p><b>Module 2 :- Hadoop</b></p> <p>2.1 Introduction to Hadoop. Core Hadoop Components, Hadoop Ecosystem-Apache HBase,Hive, HCatalog, Pig, Mahout, Oozie, Zookeeper, Sqoop, Physical Architecture, Hadoop limitations</p> <p><b>Module 3 :- NoSQL</b></p> <p>3.1 Introduction to NoSQL, NoSQL business drive 3.2 NoSQL data architecture patterns: Key-value stores, Graph stores, Column family (Bigtable) stores, Document stores, Variations of NoSQL architectural patterns</p> <p>3.3 Using NoSQL to manage big data: What is a big data NoSQL solution? Understanding the types of big data problems; Analyzing big data with a shared-nothing architecture; Choosing distribution models: master-slave versus peer-to-peer; Four ways that NoSQL systems handle big data problems</p> <p>Managing MongoDB database with CRUD operations.</p>
ILO 7013	Management Information System	Mr. Prasad Padalkar	<p><b>Module 1:</b> Introduction To Information Systems (IS): Computer Based Information Systems, Impact of IT on organizations, Importance of IS to Society, Organizational Strategy, Competitive Advantages and IS.</p> <p><b>Module 2:</b> Data and Knowledge Management: Database Approach, Big Data, Data warehouse and Data Marts, Knowledge Management, Business intelligence (BI): Managers and Decision Making, BI for Data analysis and Presenting Results</p> <p><b>Module 3:</b> Ethical issues and Privacy: Information Security. Threat to IS, and Security Controls</p>
ILO 7016	Cyber Security and Laws	Dr. Phiroj Shaikh	<p><b>Module-1: Introduction to Cybercrime:</b> Cybercrime definition and origins of the world, Cybercrime and information security, Classifications of cybercrime, Cybercrime and the Indian ITA 2000, A global Perspective on cybercrimes.</p> <p><b>Module-2: Cyber offenses &amp; Cybercrime:</b> How criminal plan the attacks, Social Engg, Cyber stalking, Cyber café and Cybercrimes, Bot nets, Attack vector, Cloud computing, 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, Devices-Related Security Issues, Organizational Security Policies and Measures in Mobile Computing Era, Laptops</p> <p><b>Module-3: Tools and Methods Used in Cyber crime-</b> Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms,</p>
ILO 7019	Development Engineering	Dr. Ashwini Kotrashetti	<p><b>Module 1: Introduction to Development</b></p> <p>Need for development, Measure of Development - Economic and Social aspects of development (Includes GDP, GNP, PPP), HDI.</p> <p><b>Module 2: Rural Development</b></p> <p>Need for rural development, Characteristics of Rural Society, Problems with Rural Society, Components of Rural Development, Credit and Marketing System, Provision for Non-Farming Occupations, Agriculture Diversification, Organic Farming, Schemes To Raise The Rural Incomes &amp; Quality Of Life, Sustainability and Sustainable Development, UN SDG and extension activities of GoI in alignment with UN SDG.</p>

**BE – SEM VII**

Course Code	Course Name	Faculty Incharge	Syllabus
HAIMLC 701	AI and ML:AI&ML in Healthcare	Mr. Udaychandra Nayak	<p><b>Module 1: Introduction</b> Overview of AI and ML, A Multifaceted Discipline, Applications of AI in Healthcare - Prediction, Diagnosis, personalized treatment and behavior modification, drug discovery, followup care. Realizing potential of AI and ML in healthcare, Healthcare Data - Use Cases.</p> <p><b>Module 2: AI, ML, Deep Learning and Data Mining Methods for Healthcare</b> Knowledge discovery and Data Mining, ML, Multi classifier Decision Fusion, Ensemble Learning, Meta-Learning and other Abstract Methods. Algorithms, Illustrative Medical Application-Multiagent Infectious Disease Propagation and Outbreak Prediction, Automated Amblyopia Screening System etc. Computational Intelligence Techniques, Deep Learning, Unsupervised learning, dimensionality reduction algorithms.</p>
HCSC701	Cyber security: Security Information Management	Ms. Aruna Khubalkar	<p><b>Module 1: Basics of Information Security</b> 1.1 What is Information Security &amp; Why do you need it? – 1.2 Basics Principles of Confidentiality, Integrity 1.3 Availability Concepts, Policies, procedures, Guidelines, Standards 1.4 Administrative Measures and Technical Measures, People, Process, Technology, IT ACT 2000, IT ACT 2008</p> <p><b>Module 2: Current Trends in Information Security</b> 2.1 Cloud Computing: benefits and Issues related to information Security. 2.2 Standards available for InfoSec: Cobit, Cadbury, ISO 27001, OWASP, OSSTMM. 2.3 An Overview, Certifiable Standards: How, What, When, Who.</p> <p><b>Module 3: Threat &amp; Risk Management</b> 3.1 Threat Modelling: Threat, Threat-Source, Vulnerability, Attacks. 3.2 Risk Assessment Frameworks: ISO 31010, NIST-SP-800-30, OCTAVE 3.3 Risk Assessment and Analysis: Risk Team Formation, Information and Asset Value, Identifying Threat and Vulnerability, Risk Assessment Methodologies 3.4 Quantification of Risk, Identification of Monitoring mechanism, Calculating Total Risk and Residual Risk.</p>
HDSC701	Data Science for Health and Social Care	Ms. Kirti Bhadange	<p><b>Module 1:-Data Science for Healthcare</b> :Introduction, Healthcare Data Sources and Data Analytics for Healthcare, Applications and Practical Systems for Healthcare. Electronic Health Records(EHR), Components of EHR, Benefits of EHR, Barriers to Adopting EHR, Challenges of using EHR data, Phenotyping Algorithms.</p> <p><b>Module 2:-Biomedical Image Analysis:</b> Biomedical Imaging Modalities, Object detection, Image segmentation, Image Registration, Feature Extraction, Mining of Sensor data in Healthcare, Challenges in Healthcare Data Analysis, Biomedical Signal Analysis, Genomic Data Analysis for Personalized Medicine</p>

  
Dr. Madhavi S. Pednekar  
Head of Department

  
Ms. Pratibha Dumane  
Dean Academics