Third Year – First Semester

Mobile and Cloud Computing (BCA-311)

Discipline Core (DC); 4 Credits (3-0-2)

Objectives:

1. The ultimate goal of Mobile Cloud Computing is to enable execution of rich mobile applications on a plethora of mobile devices, with a rich user experience.

Unit	Contents	No. of Lectures
Unit 1	**Mobile Communications and Computing:** An Overview Mobile Communication, Mobile Computing, Mobile Computing Architecture, Mobile Devices, Mobile System Networks, Data Dissemination, Mobility Management, Security, Mobile Devices and Systems, Mobile Phones, Digital Music Players, Hand-held Pocket Computers, Hand-held Devices: Operating Systems, Smart Systems, Limitations of Mobile Devices, Automotive Systems.	8
Unit 2	**Cloud Computing:** Overview of Distributed Computing, Introduction to cloud computing- properties and characteristics, service model, deployment models. Infrastructure as a service (IaaS), Platform as a service (PaaS), Software as a service (SaaS), Cloud issue and challenges.	**12**
Unit 3	**Introduction and history of Android Operating System:** Open Source Software, What is Android, Native Android applications, SDK, Android SDK features, Introduction of development framework, Understanding the Android software stack, Dalvik virtual machine, Android application architecture, Android Libraries.	**12**
Unit 4	**Creating Applications and Activities:** Introduction of Android Application Menifest, Menifest editor, Permissions, API Keys, Android application lifecycle, Understanding application priority and process states, Android application class, Activity life cycle, Creating user interface, Fundamental Android UI design, Views, Layouts, Creating new views, Drawable resources, Creating and using menus, Intents, Broadcast receivers, Adapters and Internet.	**15**
		49

Reference/Text Books:

1. Dr. Sunil kumar S. Manavi, Mahabaleshwar S. Kakkasageri, Wireless and Mobile Networks, concepts and protocols, Wiley, India.
2. Debashis De, Mobile Cloud Computing: Architecture, Algorithm and Applications.

Systems Programming (BCA-313)

Discipline Core (DC); 4 Credits (3-0-2)

Objectives:

- Identify/characterize/define a problem , Design a program to solve the problem
- Create executable code, Read most Python code
- Write basic unit tests

Unit	Contents	No. of Lectures
Unit 1	Introduction : Variables ,Python Operators, Arithmetic Operator Comparison Operator, Assignment Operator, Bitwise Operator Membership Operator, Identity Operator.	**10**
Unit 2	If Statement, If Else Statement, Break & Continue Statement, For Loop, While Loop.	**10**
Unit 3	String, Number, List, Dictionary, Function, Module, Exception	**10**
Unit 4	An Introduction to Mat-lab Software, Mathematics in Mat-lab, Working with Variables in Mat-lab environment, Loops, Conditions. Functions : Introduction to Functions, Function I/O, Formal Definition of Functions, Sub-functions, Scope, Advantages of Functions, Scripts	**10**
		40

Reference/Text Books:

1. Introduction to Python: by Guido Van Rossum
2. Getting started with MATLAB, Rudra Pratap, Oxford university Press.

3. MATLAB: A Practical Introduction to Programming and Problem Solving, 3rd edition, Stormy Attaway, Elsevier.

4. G. H. Golub and C. F. Van Loan, Matrix Computations, 3 rd Ed., Johns Hopkins University

Web Technology (BCA-312)

Discipline Core (DC); 4 Credits (3-0-2)

Objectives:

1. Students should be able to design and implement a basic website.
2. Students should be able to implement different navigation strategies.
3. Students should be able to use client-side technologies (XHTML, CSS, forms, JavaScript).
4. Students should be able to develop simple back-end database to support a website.

Unit	Contents	No. of Lectures
Unit 1	Basic design and implementation of websites, Back-end data management	**12**
Unit 2	Discussion of different navigation and organizational strategies	**12**
Unit 3	Client-side technologies including HTML5, CSS, JavaScript, JSON, and JQuery	**12**
Unit 4	Server-side technologies emphasizing implementations in PhP, Emerging technologies	**12**
		48

Reference/Text Books:

1. Web Programming Step by Step, J. Miller, V. Kirst, Marty Stepp, Step by Step Publishing; 2nd edition (2012)

Cyber Security and Cyber Law (HU-315)

Humanities and Social Science (HU); 4 Credits (3-1-0)

Objectives:

1. To create a secure cyber ecosystem in the country, generate adequate trust and confidence in IT system and transactions in cyberspace and thereby enhance adoption of IT in all sectors of the economy.
2. To enable effective prevention, investigation and prosecution of cybercrime and enhancement of law enforcement capabilities through appropriate legislative intervention.
3. To enable Protection of information while in process, handling, storage & transit so as to safeguard privacy of citizen's data and reducing economic losses due to cybercrime or data theft.

Unit	Contents	No. of Lectures
Unit 1	Introduction to Information Systems, Types of Information Systems; Introduction to information security, Need for Information security, Threats to Information Systems, Information Assurance; Cyber Security, and Security Risk Analysis.	**8**
Unit 2	Application security (Database, E-Mail and Internet), Data Security Consideration-Backups; Security Threats – Viruses, Worms, Trojan Horse, Bombs, Trapdoors, Spoofs, E-mail Viruses, Macro Viruses, Malicious Software; Threats to E-Commerce- Electronic Payment System, e-Cash, Credit/Debit Cards.	**7**
Unit 3	Introduction to Cryptography, Basic terms of Cryptography; Plaintext, Cipher text, Key; Concepts of Cryptography: Transposition, Substitution, Rotation Cipher, Symmetric Key & Asymmetric key; Data Encryption System (DES), Advanced Encryption System (AES) and RSA algorithm.	**6**
Unit 4	Developing Secure Information System, Application Development Security, Security Architecture & Design; Security Issues in Hardware, Data Storage & Downloadable Devices, Physical Security of IT Assets, access control and CCTV.	**10**
Unit 5	IT Act, Copyright Act, Patent Law, IPR, Cyber Laws in India; IT Act 2000 Provisions, Intellectual Property Law: Copyright Law, Software License, Semiconductor Law.	**10**
		41

Reference/Text Book:

1. Introduction to Information Security and Cyber Law; by SURYA P. TRIPATHI, R. Geol, P.K Shukla.