Shri Vaishnav Vidhyapeeth Vishvavidhyalaya, Indore

Institute of Computer Applications

Name of Program: BCA + MCA

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA1001	Compulsory	Mobile Operating System	3	1	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

***Teacher Assessment** shall be based on following components:
Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To understand the fundamentals of Mobile communication systems
- To understand the different multiplexing scheme
- To understand the significance of different layers in mobile system

Course Outcomes (Cos): After the successful completion of this course students will be able to:

- Understand the concepts of mobile and wireless communications.
- Apply the knowledge gained in exploring, application and protocol development
- Understand methods and tools used in Mobile Operating Systems
- Develop knowledge and skills of application design of Mobile Operating Systems

UNIT – I

Mobile OS Architectures: Comparing and Contrasting architectures of all three – Android, iOS and Windows - Underlying OS (Darwin vs. Linux vs. Win 8), Introduction to wireless network, mobile and cellular mobile telephone systems, analog and digital cellular systems, Networking Applications and Mobile Technology, Wireless/Direct cable, Limitations of mobile access, Private and public networks, Trusted versus untrusted connections, Roaming.

UNIT II

Evolution of Modern Mobile Wireless Communication System-First Generation Wireless Networks, Second Generation (2G) Wireless Cellular, Networks, Major 2G standards, *2.5G* Wireless Networks, Third Generation 3G Wireless, introduction to MAC, SDMA, FDMA, TDMA, CDMA, Hand offs and dropped calls-initiation of handoff, power difference, mobile assisted cell-site and Intersystem handoff.

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UNIT III

Mobile Telecommunication standards, GSM Architecture and Protocols, General Packet Radio Services: (GPRS) Networks Architecture, GPRS Interfaces and Reference Points, GPRS Logical Channel, GPRS Mobility Management Procedures, GPRS Attachment and Detachment, introduction to DECT, TETRA, IMT-2000, CTEO, satellite systems – GEO, LEO and MEO, and broadcast systems –Digital audio and video broadcasting

UNIT IV

Network support for mobile systems, Mobile IP introduction, IP packet delivery, MIPV4 and MIPv6, Tunneling, and Reverse Tunneling MIPv4, MIPv4 Route Optimization, Mobility Management Issues, Role of IP on Wireless Networks IP for GPRS

UNIT V

Switched Domain Protocol Stacks, Role of Interfaces, Interface and Mobility Management, Packet routing and transport of user data in UMTS, Mobile transport and application layer protocol, GTP Tunnel, WWW, WAP.

Suggested Readings:

1. Arash Habibi Lashkari, Mohammadreza Moradhaseli, “Mobile Operating Systems and Programming”, VDM Verlag Publications, 2011
2. Lauren Collins, Scott R. Ellis, “Mobile Devices: Tools and Technologies”, Kindle Edition, 2015
3. Dominic Chell , Tyrone Erasmus ,Shaun Colley “The Mobile Application Hacker's Handbook”, WILEY, 2015
4. Michael J. Jipping, “Smartphone Operating System Concepts with Symbian OS: A Tutorial Guide”, Wiley, 2007
5. Silberschatz, Galvin, Gagne, “Operating System Concepts”, Wiley, 2009
6. Andrew S. Tanenbaum, “MODERN OPERATING SYSTEMS”, PHI, 2013
7. Jochen Sciiiller, "Mobile Communications ", Pearson Education India, 2009
8. Theodore S. Rappaport, “Wireless Communications: Principles and Practice”, Pearson Education, 2010
9. William C.Y Lee, "Mobile Cellular Telecommunications ", McGraw Hill, 1995
10. Sobell, Gargenta, Wildermuth, ”Introduction to mobile operating systems”, Pearson, 2014

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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA1002	COMPULSORY	Business Intelligence and Data Analytics	4	0	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To familiarize the students with the need and scope of the subject.
- Provide an exposure giving a strong foundation to the data analytics practices.
- Create a basis for the use of advanced investigative and computational methods to convert information to useful knowledge.
- To develop an understanding of how business analytics is actually performed
- Covers foundational techniques and tools required for data science and big data analytics.

Course Outcomes (Cos): After the completion of the course the student will be able to

- Explain the information lifecycle from events in the real world to business actions,
- Recognize the types of events and characteristics that are often used in business analytics,
- Use the data captured by source systems and stored using both traditional and emergent technologies,
- Gain a high-level familiarity with relational databases and learn how to use a simple but powerful language called SQL to extract analytical data sets of interest
- Appreciate the spectrum of roles involved in the data lifecycle, and gain exposure to the various ways that organizations structure analytical functions,
- Summarize some of the key ideas around data quality, data governance, and data privacy
- function on multi-disciplinary teams
- understand the professional and ethical responsibility
- use and present the broad contours of the different types of data analytics, namely, descriptive, inferential, predictive, and prescriptive analytics.
- make good decisions using empirical approaches and wide range of data analytic techniques

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PRE- REQUISITES:

This course requires the familiarity with linear algebra, calculus, matrix operations, probability theory, statistics, programming, Database Management System

Syllabus

Unit I

Statistical Concepts: Population, Sample, Sampled data, Sample space, Random sample, Sampling distribution, Variable, Variation, Frequency, Random variable, Uniform and Exponential random variable

Measures of Central Tendency: Mean, Median, Range, Mode; Variance, Standard Deviation.

Unit II

Correlation and Regression: Linear Correlation, Correlation and Causality, Linear Regression, Linear Regression with Nonlinear Substitution,

Classification, Classification Criteria, Naive Bayesian Classifier, Support Vector Machine

Unit III

Big Data: Introduction and basics, Evolution of Data Management, Definition, Importance, Architecture of Big Data Management System, Stages of Big Data Management, Data Analytics: Introduction, Drivers, pillars of Analytics: descriptive, predictive and prescriptive. Core Components of analytical data architecture, Performance issues, Big Data Types, Structured Data, sources of big structured data and unstructured data, relational databases and big data, Integration of data types into a big data environment

Unit IV

Column oriented database, Parallel vs. distributed processing, Shared nothing data architecture and Massive parallel processing, Elastic scalability, Data loading patterns, Data Analytics lifecycle: Discovery, Data Preparation, Model Planning, Model Building, Communicating results and findings, Methods: K means clustering, Association rules.

Machine Learning, supervised and unsupervised learning, use of regression, classification, Unsupervised Learning and Challenges for Big Data Analytics, Clustering, Associative Rule Mining, Challenges for big data analytics

Unit V

Data Science Tools- Cluster Architecture vs Traditional Architecture, The Introduction to R, Data Manipulation and Statistical Analysis with R, Basics, Simple manipulations, Numbers and vectors, Input/ Output, Arrays and Matrices, Loops and conditional execution, functions, Data Structures, Data transformations, Strings and dates, Graphics.

Suggested Readings:

1. Big Data For Dummies by Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman, Wiley, ISBN: 978-1- 118-50422-2, 2013.
2. Data Analytics, Models and Algorithms for Intelligent Data Analysis by Runkler, Thomas A., Springer Vieweg, ISBN 978-3-8348-2589-6, 2013.
3. Big Data Analytics with R and Hadoop, by Vignesh Prajapati, Packt Publication, ISBN 978-1-78216-328-2, 201.
4. Hastie, Trevor, et al. The elements of statistical learning. Vol. 2. No. 1. New York: springer, 2009.
5. Montgomery, Douglas C., and George C. Runger. Applied statistics and probability for engineers. John Wiley & Sons, 2010.
6. "Data Science and Big Data Analytics Student Guide" distributed by EMC Education Services.
7. "Big Data Black Book" , DT Editorial Services, Dreamtech Press, 2016

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							THEORY			PRACTICAL	
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BCCA1003	**Compulsory**	**Internet of Things (IOT)**	3	1	0	4	60	20	20	0	0

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

This course deals with Introduction of Embedded system and various aspects such as devices, platform and Technologies of Internet of Things (IoT).

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes

The students will be able to

1. Understand the basics of Embedded System and IoT.

2. Get the knowledge of various IoT Devices and Technologies.
3. Understand the concepts of various IoT platforms, its barriers and Applications.

Syllabus

UNIT-I

Background: Background and Introduction of Embedded system, Basic Embedded System and its architecture, Major Application area and purpose of Embedded System, concepts of IOT and Basic Architecture of IOT.

UNIT-II

IOT Devices: various types of Amplifiers, Commonly used amplifier ICs, Analog to Digital converter (ADC) and Digital to Analog converter (DAC), Relays, Display, Switches, Actuators, overview of various sensors such as Light, Temperature, Weight, Gas sensor, Ultra Sonic, Light (LDR, Photo Diode)

UNIT-III

IOT Technologies: GPS, GSM, GPRS, RFID, Bluetooth, Zigbee, Introduction to Arduino and Raspberry-Pi.

UNIT-IV

IOT Platforms: Wearable, Embedded, Cloud. Internet & Networking: Knowledge of networking, IP address, MAC address, routers, servers, cloud, client, webpage.

UNIT-V

Application of IOT: IOT Adoption barrier: Complexity, Security, Privacy & Trust. Networks and Communication, Overview of serial communication, Processes, Data Management, Device Level Energy Issues, IoT Related Standardization.

Suggested Readings:

1. Vijay Madisetti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014.
2. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything",1st Edition, Apress Publications, 2013
3. Shibu K. V., "Introduction to Embedded Systems", TMH, 2009.
4. John Vetelino, Aravind Reghu, Introduction to Sensors, 1st edition, CRC Press 2010.

List of Experiments:

Identify embedded systems features
Identify components, concepts and design methodologies
Interpret data-sheets, documentation and specifications
Design, build and troubleshoot an embedded control system

Practice on modeling, analysis and design of control systems
Practice on real-time programming and operating systems
Evaluate system performance

Name of Prgram: BCA+MCA

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							THEORY			PRACTICAL	
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BCCA1004	Compulsory	Cryptography and Network Security	3	1	0	4	60	20	20	0	0

Legends: L , Lecture; T , Tutorial/Teacher Guided Student Activity; P , Practical; Q/A , Quiz/Assignment/Attendance; MST , Mid Semester Test.
***Teacher Assessment** shall be based on following components:
Quiz/Assignment/Project/Participation in class activities, given that no component shall exceed more than 10 marks

Course Objective:

- identify some of the factors driving the need for network security
- identify and classify particular examples of attacks

Outcomes course students will be able to:

- Provide security assessment of networks.
- Use the basic concepts of secure communication via insecure networks to design secure architectures.
- Describe and justify relevant alternatives and decision recommendations.
- Implement security management in networks.

UNIT-I

Introduction to security attacks, services and mechanism, Classical encryption techniques substitution ciphers and transposition ciphers, cryptanalysis, steganography, Stream and block ciphers. Modern Block Ciphers: Block ciphers principles, Shannon's theory of confusion and diffusion, fiestal structure, Data encryption standard (DES), Strength of DES, Idea of differential cryptanalysis, block cipher modes of operations, Triple DES.

UNIT-II

Confidentiality using symmetric encryption: Placement of Encryption function, traffic confidentiality, key distribution, and random number generation.

Prime numbers, Fermat's and Euler's Theorems, testing for primality, the Chinese remainder theorem, discrete logarithms. Principles of Public key cryptosystems, the RSA algorithm. Key management, diffie-Hallman key exchange, elliptic curve arithmetic, and elliptic curve cryptography.

UNIT-III

Authentication Requirements, Authentication functions, message authentication codes, hash functions, security of hash function and MACs. MD5 message digest algorithm, secure Hash algorithm Overt and Covert Channels, Working, Types (Remote Access Trojans, Data-Sending Trojans, Destructive Trojans, Trojans, Proxy Trojans, FTP Trojans, Security Software Disablers). Viruses and Worms: Characteristics, Working, Infection Phase, Attack Phase. Sniffers: Definition,

UNIT-IV

Web Security: Operation, Design Principles, Trusted Systems. Computer Forensics, Need, Objectives, Stages & Steps of Forensic Investigation in Tracking Cyber Criminals, Incident Handling. Hacking, Classes of Hacker (Black hats, grey hats, white hats, suicide hackers), Foot printing, Scanning (Types-Port, Network, Vulnerability), E-Mail Spiders, Overview of System Hacking Cycle.

UNIT-V

IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key management. Introduction to Secure Socket Layer, Secure electronic, transaction (SET) .System Security: Introductory idea of Intrusion, Intrusion detection, Viruses and related threats, firewalls.

Suggested Readings:

1. William Stallings "Cryptography and Network Security", 3 ed, Pearson Education.
2. Behrouz A. Frouzan: Cryptography and Network Security, TMH
3. Stallings W. " Network security Essential " Applications & Standards", Pearson ed.
4. Kanfren "Network Secirity: Private Communications in a public world 2/e.
5. Eric Maiwald " Network Secirity : A Preginner's Guide, second ed.", Tata Mcgraw Hill.
6. Roberta Bragg "Mark Rhodes, Ousley & Keith Strassberg Network Secirity : The Complete Reference " Tata McGraw Hill.
7. Eric Maiwald "Fundamentals of Network Security" Wiley India.
8. AtulKahate, "Cryptography and Network Security", TMH

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COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
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BCCA 1015	Elective	ERP and CRM	4	0	0	4	60	20	20	0	0

Course Education Objectives (CEOs):

- To understand the business process of an enterprise.
- To grasp the activities of ERP and CRM project management cycle.
- To understand the emerging trends in ERP and CRM developments.

Course Outcomes (COs):

After successful completion of this course the students will be able to:

- Knowledge of ERP and CRM implementation cycle.
- Awareness of core and extended modules of ERP and CRM.

UNIT – I Introduction:
Overview of enterprise systems – Evolution - Risks and benefits - Fundamental technology – Issues to be consider in planning design and implementation of cross functional integrated ERP systems.

UNIT – II
ERP Solutions and Functional Modules: Overview of ERP software solutions- Small, medium and large enterprise vendor solutions, BPR, and best business practices - Business process Management, Functional modules.

UNIT – III
ERP Implementation: Planning Evaluation and selection of ERP systems - Implementation life cycle – ERP implementation, Methodology and Frame work- Training -Data Migration. People Organization in implementation-Consultants, Vendors and Employees, Maintenance of ERP, Success and Failure factors of ERP Implementation, Future Trends in ERP.

UNIT – IV
CRM Basics: CRM – Meaning & Definition - Dimensions of CRM - Nature of CRM - Goals of CRM - Advantages of CRM.

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UNIT - V

Implementation of CRM : CRM Implementation – A comprehensive model - Developing CRM vision and strategy Management support, CRM Tools, CRM in Service Marketing and Virtual Marketing.

Suggested Readings:

1. Alexis Leon, ERP demystified, second Edition Tata McGraw-Hill, 2008.
2. Balasubramaniyan, K., Essence of Customer Relationship Management, learn Tech press
3. For Sugar-CRM & Microsoft Dynamic CRM - Refer Internet
4. Kaushik Mukerjee – CRM – PHI.
5. M.Peeru Mohamed – CRM – Vikas
6. Sinha P. Magal and Jeffery Word, Essentials of Business Process and Information System, Wiley India, 2012
7. Jagan Nathan Vaman, ERP in Practice, Tata McGraw-Hill, 2008
8. Alexis Leon, Enterprise Resource Planning, second edition, Tata McGraw-Hill, 2008.
9. Mahadeo Jaiswal and Ganesh Vanapalli, ERP Macmillan India, 2009
10. Vinod Kumar Grag and N.K. Venkitakrishnan, ERP- Concepts and Practice, Prentice Hall of India, 2006.
11. Summer, ERP, Pearson Education, 2008

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BCCA 1035	Elective	E-Governance	4	0	0	4	60	20	20	0	0

Course Education Objectives (CEOs):

- Introduction to E-Governance
- Apply E-Governance in Local Administration and Economic Development
- Study E-Governance Initiatives at International Level
- Study the various models of E-Governance and its evolution
- Prepare various infrastructures and strategies for E-Governance

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Course Outcomes (COs):

After the successful completion of the course students should be able to:

- Understand the concept of E-Governance
- Understand the ways in which E-Governance can be modeled
- Identify the objectives of the use of Data Warehousing and Data Mining in E-Governance
- Trace the historical evolution of E-Governance
- Explain the work plan for conversion to E-Governance
- Indicate the fields in which E-Governance is to be applied

UNIT I: Introduction

E-Governance: Needs of E-Governance, Issues in E-Governance applications and the Digital Divide; Evolution of E-Governance, its scope and content; Present global trends of growth in E-Governance: Other issues.

UNIT II: Models of E-Governance

Introduction; Model of Digital Governance: Broadcasting/ Wilder Dissemination Model, Critical Flow Model, Comparative Analysis Model, Mobilization and Lobbying Model, Interactive-service Model/Government-to-Citizen-to-Government Model (G2C2G); Evolution in E-Governance and Maturity Models: Five Maturity Levels, Characteristics of Maturity Levels, Key areas, Towards Good Governance through E-Governance Models.

UNIT III: E-Governance Infrastructure and Strategies

E-readiness: Digital System Infrastructure, Legal Infrastructural Preparedness, Institutional Infrastructural Preparedness, Human Infrastructural Preparedness, Technological Infrastructural Preparedness; Evolutionary Stages in E-Governance.

UNIT IV: Data Warehousing and Data Mining in E-Governance

Introduction; 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.

UNIT V: Case Studies

Nepalese Context: Cyber Laws, Implementation in the Land Reform, Human Resource Management Software; India: NICNET, Collectorate, Computer-aided Administration of Registration Department (CARD), Smart Nagarpalika, National Reservoir Level and Capacity Monitoring System, Computerization in Andhra Pradesh, Ekal Seva Kendra, Sachivalaya Vahini, Bhoomi, IT in Judiciary, E-Khazana, DGFT, PRAJA, E-Seva, E-Panchyat, General Information Services of National Informatics Centre; E-Governance initiative in USA; E-Governance in China; EGovernance in Brazil and Sri Lanka.

Suggested Readings:

1. C.S.R. Prabhu, "E-Governance: Concepts and Case Studies", Prentice-Hall of India Private Limited, 2004.
2. Backus, Michael, "E-Governance in Developing Countries", IICD Research Brief, No. 1, March 2001.
3. Kelvin J. Bwalya, Stephen M. Mutula, "E-Government Implementation, Adoption and Synthesis in Developing Countries", De Gruyter Saur, 12 Sept. 2014.
4. J Satyanarayana, "e-Government...the science of the possible", Prentice-Hall of India Pvt.Ltd, First edition, October 30, 2004.

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BCCA1007	COMPULSORY	Lab-2 (Mobile Operating System Lab)	0	0	4	2	0	0	0	30	20

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List of Practical (Android Program)

1. Display calendar of current month
2. Display today's date and time
3. Display usernames those are currently logged in the system
4. Create menu using XML
5. Display your terminal number
6. Enable and Disable WI-Fi.
7. Perform action on any Hardware Button.
8. Java android Program to build a simple android Application.
9. Java android Program to demonstrate usage of string.xml file
10. Java android Program to perform all operation using calculator.
11. Java android Program to demonstrate to alert dialogue box
12. Java android Program to demonstrate to Sound Button application
13. Java android Program to demonstrate a simple to do application .
14. Java android Program to set the wallpaper of your device using Bitmap Class.
15. Java android Program to demonstrate Count Down Timer Application
16. Android Chat application project.

Suggested Readings:

1. Arash Habibi Lashkari, Mohammadreza Moradhaseli, "Mobile Operating Systems and Programming", VDM Verlag Publications, 2011

2. Lauren Collins, Scott R. Ellis, "Mobile Devices: Tools and Technologies", Kindle Edition, 2015

3. Dominic Chell , Tyrone Erasmus ,Shaun Colley "The Mobile Application Hacker's Handbook", WILEY, 2015

4. Michael J. Jipping, "Smartphone Operating System Concepts with Symbian OS: A Tutorial Guide", Wiley, 2007

5. Silberschatz, Galvin,Gagne, "Operating System Concepts", Wiley, 200

6. Andrew S. tanenbaum, "MODERN OPERATING SYSTEMS", PHI, 2013

7. JochenSciiiller, "Mobile Communications ", Pearson Education India, 2009

8. Theodore S. Rappaport, "Wireless Communications: Principles and Practice", Pearson Education, 2010

9. William C.Y Lee, "Mobile Cellular Telecommunications ", McGraw Hill, 1995

10. Sobell, Gargenta, Wildermuth,"Introduction to mobile operating systems", Pearson, 2014

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