



॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड
'ज्ञानतीर्थ', विष्णुपुरी, नांदेड - ४३१ ६०६ (महाराष्ट्र राज्य) भारत
SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED
'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA
Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'B++' grade

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विद्यापीठ अनुदान आयोगाने शैक्षणिक वर्ष २०२०-२१ पासून मान्यता दिलेल्या बी. व्होक (व्होकेशनल कोर्सेसचे) पदवी तृतीय वर्षाचे अभ्यासक्रमाचे (Syllabus) शैक्षणिक वर्ष २०२२-२३ पासून लागू करणे बाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, विज्ञान व तंत्रज्ञान विद्याशाखेतील विद्यापीठ अनुदान आयोगाने शैक्षणिक वर्ष २०२०-२१ पासून मान्यता दिलेल्या बी. व्होक (व्होकेशनल कोर्सेसचे) पदवी अभ्यासक्रमाचे तृतीय वर्षाचे Syllabus शैक्षणिक वर्ष २०२२-२३ पासून लागू करण्यास मा. कुलगुरू महोदयांनी मा. विद्यापरिपदेच्या मान्यतेच्या अधीन राहून मान्यता दिलेली आहे. त्यानुसार खालील अभ्यासक्रम लागू करण्यात येत आहेत.

1. B. Voc Software Development III year
2. B. Voc. Bachelor of Medical Laboratory Technology. III year
3. B. Voc. Herbal Medicine III year
4. B. Voc. Agriculture/commercial Aquaculture III year
5. B. Voc. Horticulture and Post Harvest Technology III year
6. B. Voc. Food Processing /Food Processing Technology III year
7. B. Voc. Chemical & Petrochemical Applied Analytical Chemistry III year
8. B. Voc. Life Science/Skill Based Zoology III year

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या www.srtmun.ac.in या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी. ही विनंती.

जा.क्र.:शैक्षणिक-१/परिपत्रक/व्होकेशनल अभ्यासक्रम/N-

२०२२-२३/६२५

दिनांक : २९.०९.२०२२

प्रत माहिती व पुढील कार्यवाहीस्तव :

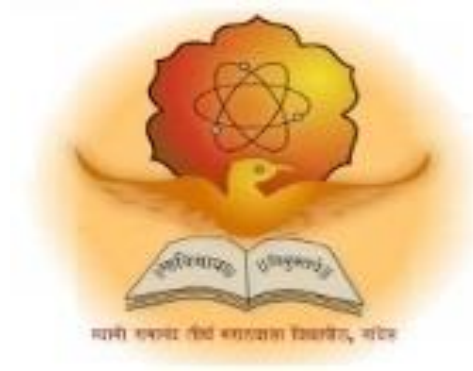
- १) मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
- २) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
- ३) प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
- ४) साहाय्यक कुलसचिव, पदव्युत्तर विभाग, प्रस्तुत विद्यापीठ.
- ५) उपकुलसचिव, पात्रता विभाग, प्रस्तुत विद्यापीठ.
- ६) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, सदरील परिपत्रक विद्यापीठाच्या संकेतस्थळावर प्रसिध्द करण्यात यावे.

(Signature)

सहाकुलसचिव

शैक्षणिक (१-अभ्यासमंडळ) विभाग

**Swami RamanandTeerthMarathwada University,
Nanded**
(NAAC Re-accredited with 'B⁺⁺' Grade)



Syllabus of
B. Voc. Software Development
(3rd year)

Introduced from Academic Year 2022-23

Common Question paper pattern for B.Voc. programs (Not for Campus)

Swami RamanandTeerthMarathwada University, Nanded

Faculty Of Science and Technology

Question Paper Pattern WEF Academic Year 2022-2023

B.Voc. (Software Development)

First Semester and Second Semester

(CBCS Patter Affiliated Colleges)

Time: 03 Hrs

Max Marks: 75

Note: i) All Questions are Compulsory

ii) Assume suitable data, if necessary

iii) Figures to the right indicates full marks.

Q.1: Attempt any **Five** of the following: (3-marks each) 15

- a)
- b)
- c)
- d)
- f)
- g)

Q.2: Attempt any **Three** of the following: (5-marks each) 15

- a)
- b)
- c)
- d)
- e)

Q.3: Attempt any **Three** of the following: (5-marks each)

15

- a)
- b)
- c)
- d)
- e)

Q.4: Attempt any **Three** of the following: (5-marks each)

15

- a)
- b)
- c)
- d)
- e)

Q.5: Attempt any **Three** of the following: (5-marks each)

15

- a)
- b)
- c)
- d)
- e)

NOTE: The Questions are based on the all Units in the Syllabus.

Semester - V

Sr. No.	Course Code	Course Title	Continuous Assessment Credits (CA)	End Semester Exam Credits (ESE)	Total Credits
General Education					
1	BSD501	Logical and Analytical Reasoning	1	3	4
2	BSD502	Fundamentals of Cyber Security	1	3	4
3	BSD503	Software Project Management	1	3	4
Skill Courses					
4	BSD504	Mobile Application Development -I	1	3	4
5	BSD505	Dot Net Programming -II	1	3	4
Practical Skill Courses					
7	BSD506	LAB13: Lab based on Android	1	3	4
8	BSD507	LAB14: Mini Project	2	4	6
Total					30

Semester - VI

Sr. No.	Course Code	Course Title	Continuous Assessment Credits (CA)	End Semester Exam Credits (ESE)	Total Credits
General Education					
1	BSD601	Social Media Networking	1	3	4
2	BSD602	Introduction to Artificial Intelligence	1	3	4
3	BSD603	Software Testing and Quality Assurance	1	3	4
Skill Courses					
4	BSD604	Mobile Application Development-II	1	3	4
5	BSD605	Seminar Presentation	1	--	1
Practical Skill Courses					
6	BSD606	LAB15: Industrial Project	4	8	12
7	BSD607	LAB 16:Software testing tools	1	--	1
Total					30

Course Code	Course Title	Credits
BSD501	Logical and Analytical Reasoning	04
Objectives	1. To build and improve mental aptitude, critical thinking and logical skills of the students for problem solving 2. To dissect and study a problem in a logical manner to determine a practical solution to the problems 3. To improve ability of students to study information and apply logic to find patterns and make inferences. 4. To understand statements and making sense of them using logic and establishing theory.	
Outcome	After successful learning of this course students will be able to: 1. Find solutions to common problems and make informed decisions about which action to take next. 2. Understand problems and analysing the situation for viable solutions. 3. Make important decisions, determine the truth, solve problems, come up with new ideas and set achievable goals 4. Apply logical thinking to a situation to derive the correct problem solving strategy	
Unit I	Introduction of Mathematical Reasoning Basics of mathematical reasoning, Problems on Number series, Letter series, Letters -Numbers mixed series, Elementary statistics, Progressions, Averages and mixtures.	
Unit II	Arithmetic Based Problems on Quantitative Aptitude Problems and solution methods on Percentage, Profit and Loss, Proportion, Interest and Discounting, Time Speed and Distance, Time and Work, Ratio and proportion.	
Unit III	Logical Reasoning-I Important concepts in logical reasoning (Logic and Language), Understanding structure of arguments, Statements and assumptions, Statements and arguments, Statements and course of actions, Decision making.	
Unit IV	Logical Reasoning-II Assertion and reasons Cause and effect, Syllogisms, Logical diagrams (Simple diagrammatic, Multi diagrammatic relationships), Venn diagrams, problems based on the logical diagrams.	
Unit V	Analytical Reasoning Important concepts in analytical reasoning, Analytical reasoning problems on Seating arrangement, Complex arrangements, Ranking and time sequence test, Directions, Calendars, Clocks, Blood Relationship, Number Series, Coding-Decoding, Assumption.	
Suggested Readings	1. How prepare for Logical Reasoning By Arun Sharma 2nd edition Mcgraw Hill education 2. Analytical & Logical Reasoning , By PeeyushBhardwaj 3. Best Book on Analytical Reasoning, By Dr.Vandana Gupta, Writersgram Publications 4. Analytical Reasoning, By M.K.Pandey, Bsc Publisher 5. How prepare for Quantitative Aptitude By Arun Sharma 6nd edition Mcgraw Hill education	

Course Code	Course Title	Credits
BSD502	Fundamentals of Cyber Security	04
Objectives	1. To Identify Key concept and Terminology of Cyber Security. 2. To examine the concept of privacy and its legal protections. 3. To explain the primary concepts involving encryption. 4. To perform basic computer forensics and describe the social implications of cyber security. 5. To Understand the risks and benefits of social networks	
Outcome	After successful learning of this course students will be able to: 1. Evaluate fundamental cyber security concepts, theories, and strategies as they apply to real world case studies. 2. Explain technical and non-technical security solutions on different types of cyber systems. 3. Assess risks, vulnerabilities, and threats to sample cyber systems. 4. Identify attributes associated with cyber security professionals.	
Unit I	Introduction to Information System Information System- Components, Categories, Individuals, Development of Information Systems, Beginning with users, Determining need and performance expectations, Characteristics of good organizational IS talent, Stages in process design.	
Unit II	Information Security Introduction, Threats to Information Systems, Information Assurance, Cyber Security and Security Risk Analysis	
Unit III	Application Security and Encryption Introduction(Database/Email/Internet Security), Data Security Considerations(Backup Considerations, Archival Storage, Disposal of Data), Security Technology (Firewall,VPN), Intrusion Detection, Access Control, Cryptography; Cryptographic mechanisms; Digital signatures; Encryption Certificates.	
Unit IV	Security Threats Introduction to security threats, (Virus, Worms, Trojan Horse, Bombs, Trap Door, Email Spoofing, Email Virus, Macro Viruses, Malicious Software), Network and Security Attack, (Denial of Service Attack, Types of DOS Attacks, Methods of Attacks, Examples of Attacks-SYN Flood Attack, TCP/UDP/ICMP Flooding, Smurf, Ping of death, Tear Drop, LAND, Echo/Chargen, Naptha Attack,) (Electronic Payment System, Credit/Debit Cards, Smart Cards, E-Money, Electronic Fund Transfer, E-Commerce Business Model, E-Commerce Advantages and Disadvantages, E-Commerce Security Systems, Electronic Cash, Digital Signature, Public Key Cryptography.	
Unit V	Development of Secure Information System and Hardware issues Key Elements of an Information Security Policy, Information System Development Life Cycle, Application Security, (The foundation of security, Threats, Vulnerabilities,), Information Security Governance and Risk Management, Risk Management, Security Architecture and Design, Data Storage and Downloadable Devices, Physical Security of IT assets, CCTV and Intrusion Detection Systems, Security Measures	

Suggested Readings	1. Cyber security – Attack and Defense Strategies: 2nd Edition Paperback Yuri Diogenes (Author), ErdalOzkaya (Author) 2. Cyber Security Basics: Protect your organization ... (Paperback) by Franke, Don 3. Fundamentals of Cyber Security by MayankBhushan, BPB Publications, 1st Edition 4. Fundamentals of Cyber Security by Anil V. Turukmane, Lambert Academic Publishing 5. Cyber Security Basics: Protect Your Organization by Applying the Fundamentals by Don Franke, Create Space Independent Publishing Platform 6. Fundamentals of Cyber security by National Learning Corporation 7. Cyber Security Basics: Protect Your Organization by Applying the Fundamentals by Don Franke 8. Information Security Basics: Fundamental Reading For InfoSec Including The Cissp, Cism, Ccna-Security Certification Exams by Ron McFarland Ph.D. 9. Cyber security for Beginners by RaefMeeuwisse 10. Computer Security Fundamentals by William (Chuck) Easttom, II, Chuck Easttom, Pearson, 2016
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Course Code	Course Title	Credits
BSD503	Software Project Management	04
Objectives	1. To understand the basics of software project and its management activities 2. To understand and highlights an importance of software project management 3. To understand the software project planning and evaluation techniques. 4. To plan and manage projects at each stage of the software development life cycle.	
Outcome	After successful learning of this course students will be able to: 1. Understand Project Management principles while developing the software project. 2. Apply extensive knowledge of basic project management concepts, framework, and process models while developing the software. 3. Implement a project to manage project schedule, project progress, expenses and resources with the application of suitable project management tools. 4. Estimate the risks involved in various project activities.	
Unit I	Introduction of Software Project Management Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework.	
Unit II	Software Project Planning Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process.	
Unit III	Project Organization and Scheduling Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts.	
Unit IV	Project Monitoring and Control Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: 23 Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance.	
Unit V	Project Management and Project Management Tools Software Configuration Management: Software Configuration Items and tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control, Risk Management: Risks and risk types, Risk Breakdown Structure (RBS), Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis, Software Project Management Tools: CASE Tools, Planning and Scheduling Tools, MS-Project.	
Suggested Readings	1. Project Management: The Managerial Process with MS By Clifford F. Gray and Erik W. Larson, McGraw Hill 2. Project Management and Tools & Technologies – An overview, By Shailesh Mehta SPD Publications 3. Software Project Management – M. Cotterell, Tata McGraw-Hill Publication. 4. Software Project Management – Royce, Pearson Education 5. Software Project Management – S. A. Kelkar, PHI Publication.	

Course Code	Course Title	Credits
BSD504	Mobile Application Development-I	04
Objectives	1. To aware the programming environment of Android Studio 2. To develop an application using android studio 3. To understand the working of various palates used in Android Studio	
Outcome	After successful learning of this course students will be able to: 1. Students are able to Android apps 2. Students are able to use various palates to develop Android apps	
Unit I	Introduction Introduction to mobile devices Palm, Pocket, smart phones, MS windows based smart phones, iphoneetc, features of mobile devices, Overview of application development platforms (OS-Palm , Symbian, BlackBerry, Windows CE, OS for iphone, Android). Comparative study of all versions of Android, Features of Android O.S.	
Unit II	Android Operating System Installations Pre-Requisite requirements for Installation of Android Studio, Hardware requirements Android SDK Features, Components of Android SDK. Introducing the Development Framework. Installation of Android SDK.	
Unit III	Android Virtual Device Introduction to Android Virtual Device, Android Emulator: introduction, use and Installation of Android Emulator, How to activate developer option on Android device, How to execute program on virtual device or Smartphone.	
Unit IV	Android Application Development Introduction to Integrated Development Environment : Manifest, Java, drawable, Gradle Script, Android Application Life cycle, components of Design window, Properties of Text palate and Button palate, components of Text palate and Button palate. Build a simple program for login page, Arithmetic Operation, introduction to events used in Android studio.	
Unit V	Intents, Broadcast Receivers, and the Internet Introducing Intents, Creating Intent Filters and Broadcast Receivers, Using Internet Resources. Introducing Dialogs and Action Bars, Creating and Using Menus.	
Suggested Readings	1. Reto Meier. Professional Android Application Development, Wrox Publications ISBN: 978-0-470-34471-2. 2. Rick Rogers, John Lombardo, ZigurdMednieks, G. Blake Meike. Android Application Development: Programming with the Google SDK. O'Reilly ISBN 10: 0596521472 / ISBN 13: 9780596521479. 3. Auxiliary Resources: https://developer.android.com/index.html	

Course Code	Course Title	Credits
BSD505	Dot Net Programming-II	04
Objectives	1. To understand .Net programming environment for developing fast and good quality software project. 2. To give understanding of C#.Net programing language for writing console and windows applications. 3. To understand object oriented programing features supported by C#.Net 4. To give understanding of web applications and database handling using ASP.Net with C#.Net programing.	
Outcome	After successful learning of this course students will be able to: 1. Identify application areas for developing the software project using .Net platform. 2. Understand OOP's features supported by C#.Net and write programs for small modules. 3. Understand and write code for console, web applications using ASP.Net with C#.Net programing 4. Develop a small software program in some application areas using web applications and ADO.Net database.	
Unit I	Introduction to C#.Net Introduction of .Net framework and its architecture, Introduction to C#, Building Blocks of C#, keywords, tokens, constants, identifiers, Data types, Console applications in C#, , Exception Handling in C#, Type Conversion, Functions.	
Unit II	Programing with C# .Net I/O statements, Decision making statements, Control flow statements, working with collections, arrays and enumeration.	
Unit III	Object Oriented Programming using C#.Net Class and objects, properties, methods and events, Constructor and destructors, Inheritance and its types, Access modifiers: Private, Public, Protected, Friend, Interfaces, and Polymorphism.	
Unit IV	Introduction to ASP.Net: What is ASP.Net? ASP.Net Page Life Cycle, Architecture of ASP. Net, Forms, Web Pages, and HTML forms, Request & Response, Introduction to ASP. Net Controls (Server Controls, HTML controls, Web Server Controls), Overview of Control structures, Functions, HTML events, web control events, Event driven programming and Post back, Validation Controls.	
Unit V	Handling Databases using C# and ASP.Net Introduction and architecture of ADO.Net, Data Provider in .Net, Connection, Command objects in ADO.Net, Data Reader, Data adapter, Datasets, Connection to the database with server control, data binding with some controls like Text Boxes, Navigating Data source, Connected and disconnected architecture.	
Suggested Readings	1. C#.Net Programming, Black Book Steven Holzner 2. C# 4.5 The Complete Reference, Herbert Schildt 3. C# 6.0 and .NET 4.6 Framework by Andrew Troelsen and PhilipJapikse 4. ASP.Net Programming Black Book, Kogent Learning Solutions Inc. 5. ASP.NET: The Complete Reference, Matthew Macdonald	

Course Code	Course Title	Credits
BSD 506	LAB13: Lab based on Android	04
	Students should provide hands-on knowledge with the Android studio for preparing small Android Apps with the knowledge they acquired through Course Code BVSD504, BSD 505 and Objectives and Outcome as per the Lab Manual designed by the subject Teacher.	

Course Code	Course Title	Credits
BSD 507	LAB14: Mini Project	06
	Students should develop mini project based on .Net technology or small mobile apps or other technologies with the knowledge they acquired various courses of this programme and Objectives & Outcome as per the Lab Manual designed by the subject Teacher.	

Course Code	Course Title	Credits
BSD601	Social Media Networking	04
Objectives	1. To make aware student with the social networking sites. 2. To prepare students for implementing the social media platform. 3. To enable students to classify various types of social media 4. To understand the basic uses of the social media.	
Outcome	After successful learning of this course students will be able to: 1. Understand the social media concept and create their account on social media. 2. Students are able to use social media effectively. 3. Understand how social media helpful for marketing purpose. 4. Understand how social media provide different services to customer and social services to society by using blogs.	
Unit I	Basics of Social Networking Introduction to social networking sites: Facebook, twitter, Linkedin, YouTubeetc, creating login to social networking sites, setting properties of an account, communication using social networking sites, advantages and disadvantages of social networking sites.	
Unit II	Social Media Strategy for Organization Social Media concept, creating and implementing the socialmedia platform, use of social media for society, Thinking of social media, The power and social Risk of SocialMedia, Social media strategy, Social media and customer.	
Unit III	Marketing and sales in social media Social media and voice of customer, Social Feedback cycle, Open access to information, Social web and engagement, Business social interaction, Product development and new services to sell, Social community marketing and selling.	
Unit IV	The New Role of the Customer The New Role: Social Interactions to make Friends, Club Membership Brings Expectations, Social Profiles, Social Applications: Support Forums, Content Sharing, Purpose-Built Applications Social media policies, Use of social media in customer service and support, responding to customer complaints	
Unit V	Organizational blogs and Diaries Definition of blog, attract blog traffic, weblog, effective communication through weblogs, online diary.	
Suggested Readings	1. Stevenson, Social Media Communications Technology” published byStevenson Inc. 2. Kevin lee, “Actionable Social Media Strategy” eBook available on https://buffer.com/resources/social-media-strategies 3. Charles Kadushin, Understanding Social Networks: Theories, Concepts, and Findings,Oxford University Press, 2012 4. MaksimTsvetovat, Alexander Kouznetsov, Social Network Analysis for Startups, O’Reilly, 2014 5. Dave Evans with Jake Mc “Social Media Marketing”.	

Course Code	Course Title	Credits
BSD602	Introduction to Artificial Intelligence	04
Objectives	1. To understand the concept of Artificial Intelligence 2. To study the Heuristic Search Techniques for problem solving 3. To study knowledge representation and logic	
Outcome	After successful learning of this course students will be able to: 1. Students will be able to understand working of intelligent machines 2. Students will be able to use various searching techniques to find the solution of the problem	
Unit I	Introduction Definition of Artificial Intelligence, Need of Artificial Intelligence, Problem domains of Artificial Intelligence, Applications of Artificial Intelligence, AI Technique.	
Unit II	Problem Solving Techniques What is problem?, Problem Characteristics, State Space Search, Control Strategy, Production System, Water Jug Problem, River Crossing Problem.	
Unit III	Knowledge Representation and Logic Definition of Knowledge, Approaches to Knowledge representation, Issues in Knowledge Representation, Introduction to Propositional Logic and Predicate Logic, Representing Simple Facts in logic, representing Instance and ISA relationships.	
Unit IV	Intelligent Agents Agents and Environment, Good behaviour: The concept of Rationality, The nature of environments, The Structure of Agents, Types of Agents.	
Unit V	Introduction to Prolog Programming structure of Prolog, Data types, Operators, Input Output statements, Function	
Suggested Readings	1. Elaine Rich and Kerin Knight , “An Introduction to Artificial Intelligence”, McGraw Hill, 4th ed., 2001 2. . Russell and Norvig , “Artificial Intelligence: a modern approach”, PHI , 3rd ed, 2013 3. Patrik Henry Winston “ Artificial Intelligence”, 3rd ed., ISBN-10: 0201533774, 2004. 4. Woolbridge, “Reasoning about Intelligent Agents”, ISBN-10: 0262515563	

Course Code	Course Title	Credits
BSD603	Software Testing and Quality Assurance	04
Objectives	1. To learn and understand the principles of the Software Testing. 2. To understand the methods of software testing and its maintenance. 3. To understand different types and levels of software testing 4. To understand different software testing techniques and tools.	
Outcome	After successful learning of this course students will be able to: 1. Understand and differentiate functional and non-functional software testing 2. Choose and apply appropriate software testing methods or techniques for developed software. 3. Differentiate verification and validation while software testing 4. Apply appropriate software quality assurance activities while developing complete software.	
Unit I	Introduction to Software Testing Introduction to software testing, Testing objectives, Testing principles, Testing lifecycle, Test Cases, Types of software testing, Level of software testing (Unit Testing, Integration Testing, System Testing, Acceptance Testing, Alpha testing & Beta testing, Static vs. Dynamic testing), Software maintenance and its types	
Unit II	Black Box & White Box Testing: Functional Testing (Black Box) Equivalence partitioning, Structural Testing (White Box), Coverage testing, Statement coverage, Branch & decision coverage, Path coverage, Domain Testing, Non-functional testing techniques, Validation testing Activities, Low level testing, High level testing.	
Unit III	Verification & Validation Verification & Validation Planning, Software inspections, Automated static Analysis, Clean room software engineering	
Unit IV	Software Quality Concept and Assurance Quality Concept, Definition of Quality, QA, SQA, Quality factors, Software Quality Metrics, Process Improvement, Process and Product Quality, The SEI Process Capability Maturity Model (CMM), ISO, Six-Sigma, Process Classification.	
Unit V	Software Quality Assurance Activities Need for SQA, SQA Activities, Building blocks of SQA, SQA Planning & Standards.	
Suggested Readings	1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, Mcgraw-Hill, ISBN: 0073375977, Seventh or Eighth Edition. 2. Introducing Software Testing Louise Tamres 3. Effective Methods for software Testing William Perry 4. Software Testing in Real World Edward Kit 5. Software Testing Techniques Boris Beizer	

Course Code	Course Title	Credits
BSD604	Mobile Application Development II	04
Objectives	1. To aware the programming environment of Android Studio 2. To develop an application using android studio 3. To connect form with database using android studio 4. To provide in depth knowledge and hands on experience in android application development, the latest trends and features.	
Outcome	After successful learning of this course students will be able to: 1. Students are able to Android apps using database 2. Students are able to understand how to convert existing apps into android app	
Unit I	Android Development I Notifications, Toast, Custom Toast, Dialogs, Status bar Notifications. Multithreading: Using Java Muti threading classes, AsyncTask, Handler, Post. Styles and Themes: Creating and applying simple Style, Inheriting built-in Style and User defined style, Using Styles as themes. Resources and Assets: Android Resource.	
Unit II	Android Development II Fragment Lifecycle, Fragment Example, Dynamic Fragment. Adaptor: Array Adaptor, Array List Adaptor, Base Adaptor. View: Grid View, Web View, Scroll View, Search View, Tab Host, Dynamic List View, Expanded List View. Creating UI through code and the XML, Communicating data among Activities, Overview of services in Android, and Implementing a Service, Service lifecycle, Recycler View.	
Unit III	Database Introducing Android Databases, SQLite Databases, Content Providers, Introducing SQLite, Content Values and Cursors, Working with SQLite Databases	
Unit IV	Data Storage, Retrieval, and Sharing FILES, SAVING STATE, AND PREFERENCES: Saving Application Data, Creating and Saving Shared Preferences, Retrieving Shared Preferences, Introducing the Preference Framework and the Preference Activity, Including Static Files as Resources, Working with the File System.	
Unit V	Case Study of Android Apps Google Map, Zoom, Youtube, Whats app, Mobile Banking App	
Suggested Readings	1. Dawn Griffiths, Head First Android Development, O'Reilly Media, Inc, 2015. ISBN13:978-1449362188. 2. Mark L. Murphy, the Busy Coder's Guide to Android Development, Commons Ware, LLC, 2015, ISBN-13:978-0981678009. 3. Wallace Jackson, Android Apps for Absolute Beginners, Apress, 2012. ISBN-13:978- 1430247883. 4. Dawn Griffiths and David Griffiths, Head First Android Development: A Brain-Friendly Guide, O'Reilly Media, Aug 19, 2017, ISBN-13: 978-1491974056 5. Bill Phillips, Chris Stewart, Android Programming: The Big Nerd Ranch Guide, AddisonWesley Professional, 2015, ISBN-13: 978-0134171456.	

Course Code	Course Title	Credits
BSD605	Seminar presentation	01 (Internal)
	Students should undertake the seminar topic relevant to the computer science/information technology other than the syllabus or as per the concern teacher allot the seminar topics to the students. Student should give the seminar presentation and submit the report of the same.	
Course Code	Course Title	Credits
BSD606	LAB15: Industrial Project	12 (4 Internal + 8 External)
	Students should develop the software project in collaboration with industry and under the guidance of institute's project guide using knowledge they acquired after learning whole subjects of this program. A candidate may in certain cases be permitted to work on the projects in an industry under their guidance and supervision. Student should prepare project documentation by consulting their respective project guides and industry experts and submit the project report to the department at the time of evaluation. The project report should be bound with black colour hard covers and golden embossed with title and other details of the project on it. Project report should contain introduction, aims and objectives of the project undertaken, details of the project requirements and data collection, analysis and design with diagrams, User interface designs (Forms and Web pages), User interaction diagrams for executing the projects and finally the code of the project.	
Course Code	Course Title	Credits
BSD607	LAB 16: Software testing tools	01 Internal
	Students should be able to use the software testing tools or some manual testing methods for testing the demo software projects using designed test cases. Concern subject teacher can design the lab manual based on the relevant subjects and knowledge they acquired through these subjects.	