Subject Code	**15BCA301**
Subject Name	**Advanced Java**
Short Name	**AJAVA**
Total Lectures	**88**
Total Credits	**4**

Prerequisites:

- Basic concepts of Object Oriented Programming.
- Basic knowledge of C, C++ & Core Java Programming.

Objectives:

- To introduce the concepts and working of JDBC, AWT, RMI & Servlets.
- To learn JSP Programming.
- To learn and understand advanced concepts of Java Programming.

Units	Contents	Total Lectures
I	**JDBC:** JDBC concept, Related classes, JDBC Architecture, JDBC API, Types of JDBC Drivers, Steps to create JDBC Application, Java SQL packages, Inserting & Updating Records.	18
II	**AWT :** AWT concept, AWT components, Containers, Frames & Panels, Event Delegation Model, Event source & Handler, Event categories, Listeners & Interfaces, RMI concept, Architecture, Stubs & Skeleton, RMI classes & Interfaces, Writing simple RMI application.	18
III	**Servlets:** Servlet concept, Servlet Life cycle, Servlet Development Kit, Servlet API, Handling http Requests & Response, Using Cookies, Session Tracking.	17
IV	**Introduction to JSP:** Simple JSP concepts, Request-time expressions, Advanced JSPs: Scripts. conditionals, loops,Try-Catch.	17
V	**JFC & Swings:** Introduction to JFC, Features, Overview of Swing, Components & Containers, Swing Packages, Exploring Swing Components, Generating Swing Application.	18
	Text Books: 1. Herbert Schildt, Complete Reference Java2, Fifth Edition, Tata MacGraw Hill Publications, 2008 2. Dietel & Dietel , Java How to Program, Pearson Education 3. D.R. Collaway, Inside Servlets, Pearson Education 4. Phillip Hanna Osborne , Complete Reference JSP, McGraw-Hill	
	References: 1. Steven Holzner, Java2 Programming Black Book, DreamTech Press 2. Larne Pekowasky, Java Server Pages, Pearson Education (LPE) 3. SubhramanyamAllamaraju, Cedric Buest. Professional Java Server Programming, Apress publications 4. KanikaLakhani , Advance Java, Katson Publications	

Course Outcomes:

1. Able to develop Graphical user Interface applications and Web based applications in Java by importing applet, AWT and SWING packages.
2. Capable of developing Web based applications using Servlets and JSP to have an interactive application such as Client Server Architecture.
3. Ability to develop Web based applications by JDBC to have an interactive application with database connectivity.
4. Able to develop remote method invocation for communication between remote systems.

Subject Code	**15BCA302**
Subject Name	**LINUX AND SHELL PROGRAMMING**
Short Name	**LINUX**
Total Lectures	**88**
Total Credits	**4**

Prerequisites :

- Basic knowledge of operating system and its Functions.
- Basic Knowledge of programming in C.

Objectives:

- To learn the architecture & commands in LINUX.
- To be able to write Shell scripts to perform the given task.
- To learn the VI Editor.

Units	Contents	Total Lectures
I	**LINUX:**An introduction, The LINUX Architecture, Feature of Linux, System Origination, Linux file System, Reasons for its popularity, different flavors of Linux (e.g. Red hat, Fedora, Ubuntu), login & logout. **Linux Command:** Command format, **Directory oriented commands:** ls, Wild card Character, mkdir, rmdir, cd, psd, find, du, df. **File oriented commands:** cat, cp, rm, mv, wc, nl, file, cmp, comm.	18
II	**File Access permission:**chmod,chown,chgrp,dd,expand,nl,tac,tail,head **Process oriented Commands:**ps, **Background oriented commands:** kill, nohup, at, batch. **Communication oriented commands:** write, mail, wall. **General purpose commands:**data, who, who am I, man, cal, lpr, tee, script, tput, split, expr, bc.	17
III	**Pipes and Filters**: Introduction, pipe, Redirection. **Filters:** sort, grep, unia, more, pr, cut, paste, tr, sed, gawk.**VI Editor:** Introduction, starting vi, vi modes, insert command, delete commands, replace command, cursor movement command, search command, Yanking commands, Redo command, undo command, screen command, exmode commands.	18
IV	**Shell Programming:** Introduction, Shell script, command Grouping, shell variable, echo, expert, conditional parameters substitution, Escape mechanisms. **Positional parameters:** shift, set, read, exit, shell meta characters, control statement, if statement, test statement, test command, case statement, iterative statement, while loop, until loop, break, continue, infinite loops, shell functions, sleep, basename	18
V	**The C Shell:** Introduction, login files, setting variable, array, path setting, Aliases, history, input computation, shell scripts, special characters, control constructs, if statement, switch statement, loop ,while loop, foreach statement, repeat statement.	17
	Text Books : 3. B. Mohamed Ibrahim, "LINUX a practical Approach", Firewall media . 4. Mark G. Sobell, "A practical Guide to LINUX command, Editor and Shell Programming", Pearson, Third Edition. 5. E Balagurusamy, "Programming in C: A Primer" 3e, Tata McGraw Hill, 2010.	
	References : 8. Richard K. Blum,"Linuxfo Dummies", 8th edition,9780470116494 9. SumitabhaDas,"Unix concepts and Applications", Fourth Edition, TMH 2006, 10. Yashwantkanitkar,"Unix shell programming", First Edition, BPB Publisher,2010. 11. Behroz A. Fourzan,"Unix and Shell programming", First Edition, Cengage Learning India,2003.	

Course Outcomes :

1. Able to identify and use Linux utilities to create and manage file processing operations.
2. Ability to use Linux environment, organize directory structures in Linux/Unix.
3. Able to develop shell scripts to perform more complex tasks.
4. Use Linux pipes and redirection for complex tasks.
5. Make use of filter, filter options, filter parameters

Subject Code	**15BCA303**
Subject Name	**ASP.NET USING C#.NET**
Short Name	**.NET**
Total Lectures	**88**
Total Credits	**4**

Prerequisites :

- Basic knowledge in web programming & skill of creating web pages.
- Knowledge of HTML and other scripting languages.
- Knowledge of basic dot net technologies.
- Knowledge of dot net framework is desirable.

Objectives:

- To learn the object oriented aspects of C#.
- To learn the technologies of the .NET framework.
- To learn (ASP.NET) for web based applications.

Units	Contents	Total Lectures
I	**INTRODUCTION TO C#**: Features, Compilation and Executions, Variables, Data Types, Operators, Flow Controls in C#: selection (if-else, switch), iteration (for, while, do-while), jump statements (go-to, break, continue).Arrays, Strings.	17
II	**OBJECT ORIENTED ASPECTS OF C#**: classes, objects, encapsulation, polymorphism and inheritance. **ADVANCED C#:** Interfaces, namespaces, structures, Exception handling.	18
III	**INTRODUCTION TO ASP.NET**: features, structure of ASP.NET web application, file types in ASP.NET, ASP.NET page and application life cycle, ASP.NET coding models: single page and code behind page models, ASP.NET web page syntax, Directives.	18
IV	**STANDARD WEB SERVER CONTROLS**: Button, TextBox, Label, CheckBox, RadioButton, Hyperlink, ListBox, DropDownList, Image, Calendar control and Panel Control. **VALIDATION CONTROLS**: RequiredFieldValidator, RangeValidator, CompareValidator, RegularExpressionValidator, CustomValidator, ValidationSummary	18
V	**INTRODUCTION TO ADO.NET:** Architecture, Data provider in ADO.NET,Connected and disconnected data access, Data Sets, Data Reader. **OVERVIEW OF DATA CONTROLS FOR WEB APPLICATIONS:** GridView, DataList, DetailsView, Repeater.	17
	Text Books : 1. Kogent Learning Solutions Inc, "C# 2010 Programming Covers .NET 4.0 Black Book",Dreamtech Press, 978-9350040317. 2. Herbert Schildt, "The Complete Reference: C# 4.0", Tata McGraw Hill, 2012. 3. Matthew MacDonald, "Beginning ASP.NET 4 in C# 2010", 978-1-4302-2609-6. 4. E Balagurusamy,"Programming in C#: A Primer" 3e, Tata McGraw Hill, 2010. 5. Andrew Troelsen, "Pro C# 2010 and the .NET 4 Platform, 5e, A Press, 2010.	
	References : 1. G. Andrew Duthrie, "Microsoft ASP.NET Step by Step" (Microsoft Press; edition (23 January 2002)). 978-0735612877 2. Anne Boehm and Ged Mead,"ADO.NET 4 Database Programming with C# 2010" Published March 2011, ISBN 978-1-890774-63-9 3. Ian Griffiths, Matthew Adams, Jesse Liberty, "Programming C# 4.0", Sixth Edition, O'Reilly, 2010. **Reference Sites:** 1. www.w3schools.com 2. www.tutorialspoint.com	

Course Outcomes:

Subject Code	**15BCA304**
Subject Name	**ADBMS**
Short Name	**ADBMS**
Total Lectures	**88**
Total Credits	**4**

Prerequisites:

- Basic concepts of Database system.
- Basics knowledge of Database management system.

Objectives:

- To introduce the concept and working of DBMS,RDBMS,ORDBMS,OODBMS
- To learn and understand basic concepts of Data Mining, Data Warehousing.

Units	Contents	Total Lectures
I	**Introduction:** Review of Database Concepts. File Organization Concepts. **Normalization**. Physical Database Design and Tuning, Index Selection, overview of database Tuning, Choices in Tuning the Conceptual schema, Choices in Tuning queries and views, DBMS benchmarking.	18
II	**Concurrency Control Transactions:** schedules, Serialization, Lock based concurrency control, Lock Management, Specialized locking Techniques. **Crash Recovery:** Introduction to Crash Recovery, Log, Check pointing, Recovery from system crash.	18
III	**Parallel and distributed databases:** Architecture for Parallel databases, parallel query. Evaluation and optimization. **Introduction to distributed databases:** Architecture, Fragmentation and Replication. Catalog Management, Distributed Query processing, Distributed transaction management.	18
IV	**Object database systems:** Objects, Indentity, Inheritance, Database Design for an ORDBMS, Storage and access methods, Query processing and Optimization. Comparing RDBMS with OODBMS and ORDBMS.	17
V	**Data Warehousing:** Introduction, DSS and OLTP, Metadata Management in Data Warehouse. Related data structures, OLAP and Data Warehouse environment. **Data Mining:** Introduction and Application areas.	17
	Text Books: 1. Raghu Ramkrishna, Database Management systems, McGraw-Hill International Editions. 2. C.G. Date, Introduction to Database systems. 3. Silberschatz, Korth, Sudarshan, Database System Concepts, MacMillan. 4. Anil Kahate, Introduction to DBMS, Pearson Edition. 5. George Marakas, Modern Data Warehousing, Mining and Visualization, Pearson Edition. 6. *J.Han, M.Kamber, Data Mining: Concepts and Techniques,2nd Edition, Morgan Kaufmann Publisher.*	
	References: 1. Charu C. Agarwal, Data Mining Textbook, Springer Publication. 2. Connolly, Database systems, Pearson. 3. *Margaret H. Dunham, Data Mining: Introductory and Advanced Topics, Pearson Education* 4. *Arun K. Pujari, Data Mining Techniques, 2nd Edition, Universities Press.*	

Course Outcomes:

1. Apply normalization process to construct the database.
2. Able to implement Concurrency and recovery strategies of DBMS.
3. Able to understand ER concepts and ER mapping to relational model.
4. Gain knowledge about parallel, distributed database systems and ORDBMS model.
5. Capable to deal with advance technologies like Data warehousing and data mining by learning its basic concepts

Subject Code	**15BCA305**
Subject Name	**SEMINAR**
Short Name	**SEM**
Total Lectures	**90**
Total Credits	**3**

Prerequisites

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Course Objectives

- To learn new topics by self learning.
- To study and review the research papers, magazines, etc.
- To develop communication, interpersonal and presenting skills.

Synopsis format:

1. Abstract
2. Introduction
3. Technology focus
4. Future scope
5. Conclusion
6. References

Seminar Report Format:

1. Abstract
2. Introduction
3. Technology Focus
4. Applications
5. Future Scope
6. Conclusion
7. References

Rules:

1. Topic should be based on recent technology.
2. Topic should be research oriented.
3. The topic may be out of the scope of syllabus.
4. Synopsis should submit the synopsis in the given format for approval by the department.
5. Synopsis should not exceed more than 2 pages, it should cover the summery of whole topic in brief.
6. Minimum 10-12 slides presentation should be prepared for seminar.
7. Seminar report should be duly signed by seminar guide.
8. It will be responsibility of guide and students to communicate about selection/rejection/preparation of the topic to each other.
9. Synopsis should be submitted within tipe span specified by Seminar In-charge.
10. Synopsis should be hand written.

Formatting Rules:

a. Paper size A4.
b. Margins all side 1 inch.
c. Line Spacing for final report 1.5
d. Font : Times New Roman
e. Size :
    i. 12 for Normal body of text in the seminar report
    ii. 14 for title and headings in the seminar report
    iii. 9 for footnote and style italic

Course Outcome:

1. Ability to learn a new technology and formulate the contents for self learning.
2. Able to present the new topic and defend the questions raised.
3. Gain self confidence and stage daring.

Subject Code	15BCA306
Subject Name	Lab-I : Advanced Java
Short Name	Lab-I
Total Teaching Hrs.	90
Total Credits	3

Sr. No.	Contents	Total Hrs.
1	To Study Creation of JDBC Connection.	3
2	Write a program for JDBC prepare statement.	5
3	Write a program for JDBC prepare statement with Result Set.	5
4	Write a program to execute SQL function using Callable statement.	5
5	To Study different AWT Components.	3
6	Write a program to create a Frame by using AWT.	5
7	Write a program to demonstrate the use of AWT Listener.	5
8	Write a program to write simple RMI application.	5
9	To Study Compilation & Deployment of Servlet.	3
10	Write a program to create Servlet which prints Simple message.	5
11	Write a program to create a Registration form in Servlet.	5
12	Write a program to create Servlet for Student details.	5
13	To Study steps to Create & Run an JSP page.	3
14	Write a program for JSP to display Date.	5
15	Write a program for JSP to connect to Ms-SQL Database & retrieve records.	5
16	Write a program for JSP to demonstrate Try-Catch.	5
17	To Study hierarchy of Java Swing classes.	3
18	Write a program for Swing to create JFrame, JButton & Methodcall inside Java Constructor.	5
19	Write a program for Swing to demonstrate the use of Inheritance.	5
20	Write a program for Swing to add any Label in your application.	5

Subject Code	**15BCA307**
Subject Name	**Lab-II(LINUX)**
Short Name	**Lab-II**
Total Lectures	**90**
Total Credits	**3**

Sr. No.	Contents	Total Hrs.
1	Case study of Linux architecture and features.	3
2	Familiarization of Linux commands: Directory oriented commands	3
3	Use of Wild card characters.	3
4	Familiarization of Linux commands: file oriented commands	3
5	Familiarization of Linux commands: file access permission commands	3
6	Familiarization of Linux commands: Process/ Background processing	3
7	commands.	3
8	Familiarization of Linux commands: communication oriented commands.	3
9	Familiarization of Linux commands: general purpose commands.	3
10	Program on Use of pipes	3
11	Program on Use of filters	3
12	Use of Vi editor inserts commands.	3
13	Use of Vi editor deletes commands.	3
14	Use of Vi editor search commands.	3
15	Program in C using arithmetic and logical operators.	3
16	Program in C to display "DCPE HVPM" N times using looping structures.	3
17	PROGRAMS for Simple Shell like display name of college, student etc.	3
18	PROGRAMS for Simple Shell using control structures.	3
19	PROGRAMS for Simple Shell using looping structure while.	3
20	PROGRAMS for Simple Shell using looping structure until.	3
21	PROGRAMS for Simple Shell using looping structure for.	6
22	PROGRAMS for C Shell script using if-else statement.	3
23	PROGRAMS for C Shell script using switch statement.	6
24	PROGRAMS for C Shell script using while loop statement.	6
25	PROGRAMS for C Shell script using for each statement.	6
26	PROGRAMS for C Shell script using repeat statement.	3

Subject Code	**15BCA308**
Subject Name	**LAB-III(ASP.NET & C#)**
Short Name	**LABIII**
Total Lectures	**90**
Total Credits	**3**

Sr. No.	Contents	Total Hrs.
1	Write Program in C# to print "Hello C#"	2
2	Write Program in C# to Swap Two numbers.	2
3	Write Program in C# to find greatest number among three numbers.	2
4	Write Program in C# to implement Switch Statement	2
5	Write Program in C# to calculate factorial of number using Do While loop	2
6	Write Program in C# to print pyramid using For Loop	2
7	Write Program in C# to find the number prime or not.	2
8	Write Program in C# to Demonstrate function.	3
9	Write Program in C# to Sort an Array.	3
10	Write Program in C# to demonstrate the concept of Class and Object.	4
11	Write Program in C# to demonstrate Access specifier.	3
12	Write Program in C# to demonstrate the concept of Constructor and Destructor.	4
13	Write Program in C# to demonstrate concept of inheritance.	4
14	Write Program in C# to demonstrate method Overloading.	3
15	Create Web Application using ASP.NET to show "Hello Word".	3
16	Create Web Application using ASP.NET to show calculator.	4
17	Create Web Application using ASP.NET to Create the registration Form.	5
18	Create Web Application using ASP.NET to demonstrate following validation controls Required Field Validator, Range Validator, and Compare Validator.	6
19	Create Web Application using ASP.NET to demonstrate Check Boxes and Radio Buttons.	5
20	Create Web Application using ASP.NET to demonstrate List Controls.	4
21	Create Web Application using ASP.NET to demonstrate Image Control.	4
22	Create Web Application using ASP.NET to demonstrate Grid view Control.	5
23	Create Web Application using ASP.NET to demonstrate repeater Control.	6
24	Create Web Application using ASP.NET to demonstrate how to Retrieve and display data.	6
25	Create Web Application using ASP.NET to demonstrate DATA controls.	4

Subject Name	Mobile Computing
Short Name	MC
Total Lectures	88
Total Credits	4

Prerequisites:

- Basic concepts of Communication system & Networking.

Objectives:

- To introduce concept and working of mobile communication system.
- To learn &understand basic concepts of Mobile computing.

Units	Contents	Total Lectures
I	**Introduction:** Applications, Short History, Market for Mobile Communication, Simplified Reference Model. **Wireless Transmission:** Frequencies for Radio Transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulation, Spread Spectrum, Cellular System.	18
II	**Medium Access Control:** Motivation for Specialized MAC, **Introduction to :**SDMA, FDMA, TDMA, CDMA, Comparison of S/T/F/CDMA. **Introduction to Telecommunication Systems:** GSM, DECT, TETRA, UMTS and IMT-2000.	18
III	**Satellite & Broadcast Systems**: History, Applications, GEO, LEO, MEO, Routing, Localization, Handover. **Broadcast Systems**: Overview, Cyclical Repetition of Data, Digital Audio & Video Broadcasting, Convergence of Broadcasting and Mobile Communications.	18
IV	**Wireless LAN:** Infrared Versus Radio Transmission, Infrastructure and Adhoc Network, IEEE 802.11, HIPERLAN, Bluetooth. **Mobile Network Layer:** Mobile IP, DHCP, Mobile Adhoc Networks.	17
V	**Mobile Transport Layer:** Traditional TCP, Classical TCP improvements, TCP over 2.5/3G Wireless Networks. **Support For Mobility:** File Systems, World Wide Web, Wireless Application Protocol, i-Mode, SyncML, WAP2.0	17
	Text Books: 1. Jochen Schiller- Mobile Communication, 2nd Edition (Pearson Education) 2. Raj Kamal- Mobile Computing, 2nd Edition (Oxford University Press) 3. GordanStuber- Principles of Mobile Communication, 3rd Edition (SpringerPublication) 4. Mazliza Othman- Principles of Mobile Computing & Communication, 2nd Edition (Auerbach Publications)	
	References: 1. Jerry D. Gibson- Mobile Communications Handbook, 3rd Edition (CRC PressPublication) 2. Tony Wakefield, David Bowler- Introduction to Mobile Communications, 2nd Edition (Auerbach Publications) 3. Yoshihiko Akaiwa- Introduction to Digital Mobile Communication, 2nd Edition 4. (Wiley Series Publication) 5. Gottapu SasibhushanaRao- Cellular Mobile Communications, 3rd Edition (Pearson Education)	

Course Outcomes:

1. Able to understand the basic concepts and principles in mobile computing and Telecommunication Systems
2. Able to identify the important issues of developing mobile computing systems and applications
3. Gain good understanding of how the underlying wireless and mobile communication networks work, their technical features, and what kinds of applications they can support;
4. Ability to understand the concept of Wireless Transmission, Satellite Transmission and broadcasting
5. Capable of organizing the functionalities and components of mobile computing systems into different layers.

Subject Code	**15BCA310**
Subject Name	**PHP/MySQL**
Short Name	**PHP/MySQL**
Total Lectures	**88**

Total Credits	**4**

Prerequisites:

- Basic knowledge of HTML, javascript, CSS, XML etc.
- Basic Knowledge of relational database system, query building and query processing.

Objectives:

- To develop the basic skills of web programming.
- To provide knowledge to create dynamic web page.
- To improve the skills for fast development of web application.
- To provide knowledge about database and communication between database & web application

Units	Contents	Total Hrs.
I	**Introduction:** Linux, Apache Web Server, Mysql, PHP and open source, Overview of PHP capabilities, PHP HTML embedding tags and syntax, simple script examples, PHP variables, operators, data types. Flow control or control structure and loops.	18
II	**Array and Functions:** Introduction to functions, declaring functions, function scope, passing arguments to function, using include files and require statements, predefined PHP functions and mailing functions.	18
III	**Object oriented concepts:** Introduction, basic class definition, visibility, constructors and destructors, static keywords, class constants, inheritance. File system and system functions.	18
IV	**Database operations**: Operations with PHP, connecting to MySql or any other database with PHP, selecting a database, building and sending query, retrieving and inserting data, PHP Mysql functions.	17
V	**Processing of HTML and PHP:** Adding PHP to HTML or processing HTML form using GET, POST, SESSION, COOKIE variables, Http and File uploads, Exception and Error handling, Debugging.	17
	Text Books : 4. Michael K. Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz, Jason Gerner, Beginning PHP, Apache,MySQL Web development, Wrox Publication. 5. Jason Gerner, Elizabeth Naramore, Morgan L. owens, Matt warden, Professional LAMP: Linux, apache, MySqland PHP5 Web development, Wrox Publication. 6. Tim Converse, Joyce Park, PHP5 and Mysql Bible , Wiley publication	
	References : 1. Lynn Beighley, Michael Morrison,Head first PHP and Mysql,Second Edition, Oreilly publication. 2. Luke Weling, Laura Thomas, PHP and MYSQL Web Development, Pearson Education.	

Course Outcomes:

1. Able to write PHP scripts to handle HTML forms.
2. Able to create PHP programs that use various PHP library functions, and that manipulate files and directories.
3. Capable to analyze and solve various database tasks using the PHP language.
4. Ability to analyze the concepts of GET, POST, SESSION and COOKIE by writing PHP programs.
5. Able to analyze and solve common Web application tasks by writing PHP programs.

Subject Code	**15BCA311**
Subject Name	**Computer Graphics Multimedia & Animation**
Short Name	**CGMA**

Total Lectures	**88**
Total Credits	**4**

Prerequisites :

- Basic knowledge about computer system, its components and functions.

Objectives:

- To acquire the basic knowledge about Computer Graphics.
- To learn the basic knowledge about various algorithms of Computer Graphics
- To understand the various types of multimedia & animation and compression techniques.

Units	Contents	Total Lectures
I	**Introduction to Computer Graphics:** Introduction, history, characteristics, advantages & disadvantages, application, components. Adapters ,Coordinates representation, software standards, **Input devices**: keyboard, mouse, trackball, space ball, joysticks, image scanner, touch panel, light pen, and voice system, **File format**: GIF, JPEG, PNG, TIFF, MPEG	18
II	**Graphics Preemptive** **Display devices**: CRT, Raster Scan Display, Random Scan Display, Flat Panel Display, LCD. Virtual reality system, Raster Scan System, Random Scan System. **Output Primitives** : Points & line, DDA algorithm, Bresenham's line algorithm, circle generation algorithm, **Attribute**: line, curve, text, area-fill	18
III	**Transformation and Clipping** **Transformation** : Introduction, translation, scaling, rotation, composite transformation, matrix representation, homogeneous coordinates, The Viewing Pipeline, Viewing Coordinate Reference Frame **Clipping:** point, Cohen-Sutherland Line Clipping, curve, text, exterior.	18
IV	**Multimedia and Compression** **Multimedia:** Introduction, overview, multimedia & hypermedia, advantages, disadvantages, application, software tools: music, Sequencing & notation, digital audio. **Compression:** introduction, need, types, evaluating & visibility, simple compression techniques, transform coding techniques.	17
V	**Animation:** Introduction, history, design of animation sequences, application, advantages, disadvantages, traditional animation, computer animation, tweening, morphing, case study on flash.	17
	Text Books : 1. Hearn d and Baker M. P, "Computer graphics-c version", 2nd edition Pearson Education. 2. Rajiv Chopda ," Computer graphics " revised edition S. Chand 3. ze-Nilan li, Mark S. Derw "Fundamental of multimedia"	
	References: 1. Siamon J. Gibb And Dianysios c. Tsichritzis, "Multimedia Programming",AddisonWesely, 1995. 2. Johan Villamil, Casanova And LeonyFernanadez, Eliar, "Multimedia Graphics", PHI, 1998 3. Malay K. Pakhira, Computer Graphics, Multimedia and Animation, 2nd Edition, PHI Publication.	

Course Outcomes:

1. Able to recognize and evaluate critical and aesthetic issues within computer graphics and the multimedia media.
2. Student gets acquainted with the basic principles of 2D and 3D computer graphics.
3. Able to implement vector and raster based graphic algorithms.
4. Able to use graphical programming interfaces.

Subject Code	15BCA312
Subject Name	Artificial Intelligence

Short Name	AI
Total Lectures	88
Total Credits	4

Prerequisites:
- Basic Knowledge of logic &reasoning.

Objectives:
- To learn &understand the Concepts of Artificial Intelligence & Expert System.
- To Study & understand role of knowledge in AI & its representation.
- To understand Applications of AI.

Units	Contents	Total Lectures
I	**Overview of AI**: Introduction, Importance of AI, AI and related fields, **knowledge concepts:** Introduction, Definition and Importance of knowledge, knowledge based system, representation of knowledge, knowledge organization, Knowledge Manipulation	18
II	**Introduction to LISP:** Syntax and Numeric function, Basic List manipulation function in LISP, Function predicates and conditional, Input, Output and Local variables. **Formalized symbolic Logics:** syntax & semantics for propositional logic, inference rule, principle of resolution, representation using rules,	18
III	**Dealing with Inconsistencies and Uncertainties:** Truth Maintenance System, Default Reasoning and the closed world assumption, Predicate completion and circumscription. **Object Oriented Representation:** Introduction, Objects, Classes, Messages and Method, Object oriented languages and system.	17
IV	**Search & Control strategies:** Introduction, Preliminary Concept, Uniformed or blind search, informed search **Matching techniques**: Introduction, structures used in matching, Measures for matching **Knowledge organization & management:** Introduction, Indexing and Retrieval Techniques, Integrating knowledge in memory.	17
V	**Natural Language Processing**: Introduction, Overview of Linguistics, Levels of Knowledge used in Language Understanding, **Grammar and Languages**: Chomsky Hierarchy of Generative Grammar, Structural representation, Transformational Grammar, **Parsing Techniques:** Top-down and Bottom up parsing, Deterministic and Nondeterministic parser. Semantic analysis and representation structure.	18
	Text Books: 1. Dan W. Patterson, Introduction to AI and Expert Systems, PHI. 2. V S Janakiraman, K Sarukesi, P Gopalakrishnan, Foundation of Artificial Intelligence and Expert System, MACMILLION. 3. P.H. Winston ,"Artificial Intelligence", Addision-Wesley Publication.	
	References: 1. Rajiv Chopra, AI a Practical Approach, S. Chand 2. Nils J. Nilsson , Principles of AI 3. E. Rich, K. K. Knight, "Artificial Intelligence", TMH	

Course Outcomes:
1. Gain Knowledge of AI and expert system.
2. Know the concept List Processing, Knowledge representation.
3. Applications of AI for designing the expert system.

Subject Name	**Data Mining**
Short Name	**DM**
Total Lectures	**88**
Total Credits	**4**

Prerequisites:
- Basics knowledge of Data and its preprocessing.
- Basic concepts of database management systems.

Objectives:
- To introduce concept and working of Data & its associated operations.
- To understand basic concepts of Mining Patterns, Cluster Analysis & Graph Mining.

Units	Contents	Total Lectures
I	**Introduction**: Data Mining Functionalities, Data Preprocessing: Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.	18
II	**Mining Frequent Patterns, Associations and Correlations:** Basic concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining Various Kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.	18
III	**Classification and Prediction**: Issues, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back propagation. Prediction: Linear Regression, Nonlinear Regression, Accuracy and Error Measures, Evaluating the Accuracy of a Classifier or Predictor.	18
IV	**Cluster Analysis:** Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Clustering High-Dimensional Data. Mining Time-Series Data, Mining Sequence Patterns in Biological Data.	17
V	**Graph Mining, Social Network Analysis and Multirelational Data Mining:** Mining Object, Spatial, Multimedia, Text and Web Data, Data Mining Applications, Trends in Data Mining.	17
	Text Books: 1. *J.Han, M.Kamber-Data Mining: Concepts and Techniques",2nd Edition, Morgan Kaufmann Publisher.* 2. *Arun K.Pujari-Data Mining Techniques, 2nd Edition, Universities Press.* 3. *David Hand, Heikki Manila, Padhraic Symth "Principles of Data Mining"PHI Publication* 4. *Margaret H. Dunham- Data Mining: Introductory and Advanced Topics Pearson Education*	
	References: 1. Charu C. Agarwal, Data Mining Textbook, Springer Publication. 2. Bhavani Thuraisingham, Data Mining Technologies, Techniques, Tools & Trends 3. PANG-NING TAN, Vipin Kumar, Michael Steinbach "Introduction to Data Mining" 4. Hongbo Du, Data Mining Techniques & Applications, Cengage Learning.	

Course Outcomes:
1. Ability to understand the concepts of data mining.
2. Able to use data pre-processing techniques to build data mining applications.
3. Able to analyze transaction databases for association rules.
4. Able to use classification methods and prediction techniques on transaction databases.
5. Ability to use various clustering techniques for categorizing data.

Subject Code	**15BCA313**
Subject Name	**PROJECT**
Short Name	**PRJ**
Total Lectures	**90**
Total Credits	**3**

Prerequisites

- Preliminary knowledge of research methodology.
- Knowledge about Computer technology and application domain in which seminar will be developed.
- Good knowledge of subject domain.

Objectives

- To give the students hands on experience of real life system development life cycle involving deadlines and team work.
- To make the students apply the Computer technologies learnt during the program.
- To provide the experience in analyzing, designing, implementation and evaluating information systems by following proper documentation process.

Rules for Project Work :

A student will be examined in the course "Project Work" as given below:

1. Project work may be done individually or in groups. However if project is done in groups, each student must be given a responsibility for a distinct task and care should be taken to see the progress of individual.
2. Students should take guidance from a guide and prepare a Project Report on "Project Work" in 3 copies to be submitted to the Head of the Department. A soft copy of project report along with source-code and data should also be submitted.
3. The Project Synopsis should contain an Introduction to Project, which should clearly explain the project scope in detail. Also, Data Dictionary, DFDs, ERDs, File designs, experimental setup and methodology.
4. The project report will be duly accessed by the guide of the project and marks will be communicated by the Head of the Department to the Examination Department.
5. The project report should be prepared in a format prescribed by the College, which also specifies the contents and methods of presentation.

General Instruction Regarding Preparation of Project Report :

TYPING :

(a) The typing shall be standard 12 pts in double spacing using only
(b) Margins must be Left 1.5 inches Right 1 inches Top 1 inches Bottom 1 inches
(c) Paper A4 size Paper

COPIES :

Two hard-bind copies (As per format displayed herewith) One original and one clean Xerox Copy.

FORMAT FOR TITLE PAGE AND FOR COVER PAGE :

PROJECT REPORT
ON
NAME OF THE PROJECT
BY
NAME OF STUDENT

GUIDED BY
NAME OF THE GUIDE

PROGRAMME NAME & CLASS

Department of Science
Degree College of Physical Eucation
Shree H. V. P. Mandal, Amravati.

ACADEMIC SESSION

Report format for Software Development Projects:

1 Blank Page at beginning
Title Page
Certificate from Guide
Acknowledgement
Index with printed Page Numbers

Subject Name	LAB-IV(Mobile computing)
Short Name	LAB-IV
Total Lectures	90
Total Credits	3

Sr. No.	Contents	Total Hrs.
1	Program to implement user interface using layout	3
2	Program to perform simple mathematical operation.	3
3	Program to implement Calculator.	3
4	Program to implement Conversion of Celsius to Fahrenheit.	3
5	Program to implement multiple widgets.	3
6	Program to implement use of button.	3
7	Write a program to implement use of list view.	3
8	Write a program to implement use of spinner	3
9	Write a program to implement use of dialog box	3
10	Write a program to implement use of control structures IF.	3
11	Write a program to implement use of dialog box for using lists	3
12	Write a program to implement use of control structures SWITCH	3
13	Write a program to implement use of LOOPING structures FOR.	3
14	Write a program to implement use of LOOPING structures with nesting.	3
15	Write a program to implement use of LOOPING structures while.	3
16	Write a program to implement use of LOOPING structures for tabular manipulation.	3
17	Case study of simplified reference model of mobile computing.	3
18	Case study of cellular system.	3
19	Case study of data communication system.	3
20	Case study of satellite system.	3
21	Case study of different types of handovers.	3
22	Case study of Digital Audio Broadcasting and Digital Video Broadcasting	3
23	Case study of wireless LAN.	3
24	Case study of Wireless application protocol.	3
25	Case study of mobile network layer.	3
26	Case study of mobile transport layer.	3
27	Case study of WAN.	3
28	Case study of Ethernet.	3
29	Case study of ISDN.	3
30	Case study of Telecommunication systems.	3

Subject Code	**15BCA315**
Subject Name	**Lab-V(PHP/MySQL)**
Short Name	**LAB-V**
Total Lectures	**90**
Total Credits	**3**

Sr. No.	Contents	Total Hrs.
1	Write a PHP script to calculate profit and Loss using simple if-else.	3
2	Write a PHP script to check, given number is Even or Odd.	3
3	Write a PHP script to swap two numbers.	3
4	Write a PHP script to display Menu items and display message to user for selected value using switch case.	3
5	Write a PHP script to check greatest among 3 numbers using nested if-else statement.	3
6	Write a PHP script to check student grade if student is pass and display Grade using If-else Ladder	3
7	Write a PHP script to print 1 to 10 numbers using for loop.	3
8	Write a PHP script to print 10 to 1 number using do-while loop.	3
9	Write a PHP for script for Array Functions.	3
10	Write a PHP for script for user defined function mechanism.	3
11	Write a PHP script to demonstrate classes and objects.	6
12	Write a PHP script to Insert student personal information into database using class, object and MYSQL functions.	6
13	Write a PHP script to Display student personal information which is previously inserted into Database using MYSQL functions (use include statement for database file).	6
14	Write a PHP script to Update student personal information which is previously inserted into Database using MYSQL functions (uses require statement for database file).	6
15	Write a PHP script to upload image on the site.	6
16	Write a PHP script to display upload images on the web page.	6
17	Write a PHP script to demonstrate COOKIES variable.	6
18	Write a PHP script to demonstrate SESSION variable.	6
19	Write a PHP script to demonstrate GET and POST Method.	6
20	Write a PHP script to upload file.	6

Subject Code	15BCA316
Subject Name	Lab-VI: CGMA
Short Name	Lab-VI
Total Lectures	90
Total Credits	3

Sr. No.	Contents	Total Hrs.
1	Write a program in C to draw 2D line.	2
2	Write a program in C to draw 2D circle.	2
3	Write a program in C to draw 2D Rectangle.	2
4	Write a program in C to draw Triangle.	2
5	Write a program in C to draw Ellipse.	3
6	Write a program in C to draw 2D Arc.	3
7	Write a program in C to draw 2D polygon.	3
8	Write a program in C to draw a square in circle.	6
9	Write a program in C to draw Hut.	6
10	Write a program in C to draw nested circle using function.	4
11	Write a program in C to draw smiley face.	3
12	Write a program in C to count text height.	3
13	Write a program in C to draw to count text width.	3
14	Write a program in C to getdrivername.	3
15	Write a program in C for putpixel function.	3
16	Write a program in C for settextstyle.	4
17	Write a program in C for setbkcolor.	4
18	Write a program in C for fillellipse.	4
19	Write a program in C for fillpolygon.	4
20	Write a program in C for DDA algorithm.	4
21	Write a program in C for Bresenhams algorithm.	4
22	Write a program in C for 2D Translation.	6
23	Write a program in C for Scaling.	6
24	Write a program in C for Rotation.	6