MCKV INSTITUTE OF ENGINEERING

NAAC Accredited "A" Grade Autonomous Institute under UGC Act 1956
Approved by AICTE & affiliated to MaulanaAbulKalam Azad University of Technology, West Bengal
243 G.T. Road (N), Liluah, Howrah- 711204, West Bengal, India
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Curriculum for Undergraduate Degree (B. Voc.) in Software Development (w.e.f. AY: 2022-23)

Part III: Detailed Curriculum

Fourth Semester (Second Year)

Course Name:	Database Management System		
Course Code:	BSD401		
Semester:	IV	Credit:	3
L-T-P:	3-0-0	Pre-Requisites:	Concepts of computer programming
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1	Understand the basic concepts and the applications of database systems
2.	Master the basics of SQL and construct queries using SQL.
3.	Understand the relational database design principles.
4.	Familiar with the basic issues of transaction processing and concurrency control.
5.	Familiar with database storage structures and access techniques

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1	**Introduction to Databases and Transactions:** What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management **Data Models:** The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction? **Database Design, ER Diagram and Unified Modeling Language:** Database design and ER Model: overview, ER Model, Constraints, ER Diagrams, ERD Issues, weak entity sets, Codd's rules, Relational Schemas, Introduction to UML	8L
2.	**Relational database model:** Logical view of data, keys, integrity rules, Relational Database design: features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF, BCNF). **Relational Algebra and Calculus:** Relational algebra: introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison. **Calculus:** Tuple relational calculus, Domain relational Calculus, calculus vs algebra, computational capabilities	10L

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3.	**Constraints, Views and SQL:** Constraints, types of constrains, Integrity constraints, Views: Introduction to views, data independence, security, updates on views, comparison between tables and views SQL: data definition, aggregate function, Null Values, nested sub queries, Joined relations. Triggers	10L
4	**Transaction management and Concurrency:** Control Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, optimistic methods, database recovery management.	8L
Total		**36L**

Course Outcomes:	
After completion of the course, students will be able to:	
1	Demonstrate the basic elements of a relational database management system.
2.	Identify the data models for relevant problems.
3.	Design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data into RDBMS and formulate SQL queries on the data.
4.	Demonstrate their understanding of key notions of query evaluation and optimization techniques.
5.	Extend normalization for the development of application software's.

Learning Resources:	
1	A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", fifth Edition McGraw-Hill
2	Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning.

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Course Name:	Introduction to Android		
Course Code:	BSD402		
Semester:	Fourth	**Credit:**	3
L-T-P:	3-0-0	**Pre-Requisites:**	
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1	Understand the Android Platform and the Android Development tools
2.	Understand how to create the interactive applications in android with multiple activities
3.	Understand how to develop and deploy Android Applications on mobile

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1.	Basic Java Java – Inheritance, Java – Overriding, Java – Polymorphism, Java – Abstraction, Java – Encapsulation, Java – Interfaces, Java – Packages Collection frameworks ArrayList, HashMap	4L
2.	Android What is Android, History and Version, Android Architecture, Core Building Blocks, Android Emulator, Install Android, Hello Android example, Internal Details, Dalvik VM, AndroidManifest.xml, R.java, Hide Title Bar, Screen Orientation	3L
3.	Android Widgets UI Widgets, Working with Button, Toast, Custom Toast, ToggleButton, CheckBox, Custom CheckBox, RadioButton, Dynamic RadioButton, Custom RadioButton, AlertDialog, Spinner, AutoCompleteTextView, ListView, Custom ListView, RatingBar, WebView, SeekBar, DatePicker, TimePicker, Analog and Digital, ProgressBar, Vertical ScrollView, Horizontal ScrollView, ImageSwitcher, ImageSlider, ViewStub, TabLayout, TabLayout with FrameLayout, SearchView, SearchView on Toolbar, EditText with TextWatcher	10L
4.	Activity and Intents Activity LifeCycle, Implicit Intent, Explicit Intent, StartActivityForResult, Share App Data, Android Fragments Android Fragments Android Menu Option Menu, Context Menu, Popup Menu, Android Service, Android Service, Android AlarmManager, Android AlarmManager	9L

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5.	Android Storage Android Preferences, Internal Storage, External Storage, Android SQLite, SQLite Tutorial, SQLite Spinner Android Web service JSON Parsing, Rest api and methods Android Multimedia MediaPlayer: Audio VideoView: Video	10L
Total		**36L**

Course Outcomes:	
After completion of the course, students will be able to:	
1.	understanding the fundamentals of Android operating systems
2.	understand the skills of using Android software development tools
3.	understand how to develop android applications for mobile

Learning Resources:	
1.	Head First Android Development: A Brain-Friendly Guide by David Griffiths
2.	Android Programming for Beginners: Build in-depth, full-featured Android 9 Pie apps starting from zero programming experience by, John Horton

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Course Name:	Internet Technology			
Course Code:	BSD403			
Semester:	IV	**Credit:**		3
L-T-P:	3-0-0	**Pre-Requisites:**		
Full Marks:	50			
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10		Attendance: 05

Course Objectives:	
1.	To have an idea on Internet working principles
1	To be able to design simple static web pages using html tags
3.	Implementation of user interfaces following design principles and using technologies such as HTML, CSS, JavaScript and JQuery
4.	Implementation of server side scripting with PHP

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1.	Internet: History of internet, The early years, The global Internet, A global information infrastructure, Review of packet switching and its relevance to the internet, topologies, Routers, Dial-up access, IP address. Transmission Control Protocol (TCP), Domain names, Names and IP address, TCP/IP, Flexibility, Reliability and efficiency.	5L
2.	World Wide Web (WWW): Browsing the World Wide Web (WWW), HTML, Web page design with HTML, Features and importance of HTML. Advanced WEB technologies.	5L
3.	HTML: General Introduction to Internet and WWW; Text tags; Graphics, Video and Sound Tags; Link and Anchor Tags; Table Tags; Frame Tags; Miscellaneous tags (layers, image maps etc); CSS; DHTML; Example Applications; HTML Forms and Fields.	8L
4	Javascript: Basic data types; control structures; standard functions; arrays and objects, event driven programming in Javascript; Alert, Prompt and Confirm statements, Javascript validation, Example Applications.	8L
5.	PHP: Introduction to PHP,Using Program editor and IDE Variables, Operators Constants, Language constructs: Control Flow,Functions MySQL Basics- Datatypes, Commands, Connecting to MySQL database	10L
Total		**36L**

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Course Outcomes:		6	P a g e
After completion of the course, students will be able to:			
1.	Understand basic of Internet working principle		
2.	Design static web page and dynamic page with Java script		
3.	Understand basic program elements in PHP		
4.	Outline the principles behind using MySQL as a backend DBMS with PHP		

Learning Resources:	
1.	Advanced Programming in Web Design, V.K. Jain, Cyber Tech Publications, 2008
2.	Internet and Worldwide web programming: How to Program, H M Deitel, P J Deitel, A B Goldberg, Pearson, 2007.
3.	Web Technologies: A Computer Science Perspective, Jackson, Pearson Education, 2007.
4.	PHP: The Complete Reference, S. Holzner, TMH, 2007
5.	HTML & Web Design, K. Jamsa, Konrad King, TMH, 2002
6.	Robin Nixon, PHP, MySQL & JavaScript with JQUERY,CSS & HTML5, O,Reilly

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Course Name:	ERP in Business and Corporate		
Course Code:	BSD404		
Semester:	IV	Credit:	3
L-T-P:	3-0-0	Pre-Requisites:	
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1	Describe the concept of ERP and the ERP model; define key terms; explain the transition from MRP to ERP; identify the levels of ERP maturity.
2.	Explain how ERP is used to integrate business processes; define and analyze a process; create a process map and improve and/or simplify the process; apply the result to an ERP implementation.
3.	Describe the elements of a value chain, and explain how core processes relate; identify how the organizational infrastructure supports core business processes; explain the effect of a new product launch on the three core business processes.

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1	ERP Introduction, Benefits, Origin, Evolution and Structure: Conceptual Model of ERP, the Evolution of ERP, the Structure of ERP.	6L
2.	Business Process Reengineering, Data Warehousing, Data Mining, Online Analytic Processing (OLAP), Product Life Cycle Management (PLM), LAP, Supply chain Management.	10L
3.	ERP Marketplace and Marketplace Dynamics: Market Overview, Marketplace Dynamics, the Changing ERP Market. ERP- Functional Modules: Introduction, Functional Modules of ERP Software, Integration of ERP, Supply chain and Customer Relationship Applications.	10L
4	ERP Implementation Basics, ERP Implementation Life Cycle, Role of SDLC/SSAD, Consultants, Vendors and Employees. ERP & E-Commerce, Future Directives- in ERP, ERP and Internet, Critical success and failure factors, Integrating ERP into organizational culture. Using ERP tool: either ORACLE or SAP format to case study.	10L
Total		**36L**

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Course Outcomes:	
After completion of the course, students will be able to:	
1.	Develop model for ERP for large projects.
2.	Describe the advantages, strategic value, and organizational impact of utilizing an ERP system for the management of information across the functional areas of a business: sales and marketing, accounting and finance, human resource management, and supply chain.
3.	Demonstrate a working knowledge of how data and transactions are integrated in an ERP system to manage the sales order process, production process, and procurement process.
4.	Evaluate organizational opportunities and challenges in the design system within a business scenario.

Learning Resources:	
1	Vinod Kumar Garg and Venkitakrishnan N K, "Enterprise Resource Planning Concepts and Practice", PHI.
2	Rahul V. Altekar "Enterprise Resource Planning", Tata McGraw Hill,
3	Ashim Raj Singla, "Enterprise Resource Planning", CENGAGE Learning
4	Alexis Leon, "Enterprise Resource Planning", Tata McGraw Hill
5	Alexis Leon, "ERP Demystified", Tata McGraw Hill
6	Joseph A Brady, Ellen F Monk, Bret Wagner, "Concepts in Enterprise Resource Planning", Thompson Course Technology.
7	Mary Summer, "Enterprise Resource Planning"- Pearson Education
8	Sandeep Desai, Abhishek Srivastava, "ERP to E^2RP – A Case Study Approach", PHI.

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Course Name:	Database Management System Lab		
Course Code:	BSD491		
Semester:	IV	**Credit:**	1.5
L-T-P:	0-0-3	**Pre-Requisites:**	Concepts of computer programming
Full Marks:	50		
Examination Scheme:	Semester Examination: 30	Continuous Assessment:20	

Course Objectives:	
1	Understand the basic concepts and the applications of database systems
2.	Master the basics of SQL and construct queries using SQL.
3.	Understand the relational database design principles.
4.	Familiar with the basic issues of transaction processing and concurrency control.
5.	Familiar with database storage structures and access techniques

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1.	Design a Database and create required tables. For e.g. Bank, College Database	3P
2.	Apply the constraints like Primary Key, Foreign key, NOT NULL to the tables.	3P
3.	Write a sql statement for implementing ALTER, UPDATE and DELETE	3P
4.	Write the queries to implement the joins	3P
5.	Write the query to implement the concept of Integrity constrains	3P
6.	Write the query to create the views	3P
7.	Perform the following operation for demonstrating the insertion , updation and deletion using the referential integrity constraints	3P
8.	Write the query for creating the users and their role	3P
9.	PL/SQL Basics	3P
10.	Procedures and Functions	3P
Total		**30P**

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Course Outcomes:	
After completion of the course, students will be able to:	
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2.	Identify the data models for relevant problems.
3.	Design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data into RDBMS and formulate SQL queries on the data.
4.	Demonstrate their understanding of key notions of query evaluation and optimization techniques.
5.	Extend normalization for the development of application software's.

Learning Resources:	
1.	**Database System Concepts**, by Silberschatz, Sudarshan, and Korth
2.	Database Management Systems by Raghu Ramakrishnan, and Johannes Gehrke

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Course Name:	Android Application Development Lab		
Course Code:	BSD492		
Semester:	IV	**Credit:**	1.5
L-T-P:	0-0-3	**Pre-Requisites:**	
Full Marks:	50		
Examination Scheme:	Semester Examination: 30	Continuous Assessment:20	

Course Objectives:	
1	Understand the Android Platform and the Android Development tools
2.	To create the interactive applications in android with multiple activities
3.	To develop and deploy Android Applications on mobile

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1.	**Basic Java** Java – Inheritance, Java – Overriding, Java – Polymorphism, Java – Abstraction, Java – Encapsulation, Java – Interfaces, Java – Packages **Collection frameworks** ArrayList, HashMap	6P
2.	Installation, Familiarization with Android **Android Widgets** UI Widgets, Working with Button, Toast, Custom Toast, ToggleButton, CheckBox, Custom CheckBox, RadioButton, Dynamic RadioButton, Custom RadioButton, AlertDialog, Spinner, AutoCompleteTextView, ListView, Custom ListView, RatingBar, WebView, SeekBar, DatePicker, TimePicker, Analog and Digital, ProgressBar, Vertical ScrollView, Horizontal ScrollView, ImageSwitcher, ImageSlider, ViewStub, TabLayout, TabLayout with FrameLayout, SearchView, SearchView on Toolbar, EditText with TextWatcher	9P
3.	**Activity and Intents** Activity LifeCycle, Implicit Intent, Explicit Intent, StartActivityForResult, Share App Data, **Android Fragments** **Android Menu** Option Menu, Context Menu, Popup Menu, Android Service, Android Service, Android AlarmManager, Android AlarmManager	6P
4.	**Android Storage** Android Preferences, Internal Storage, External Storage, Android SQLite, SQLite Tutorial, SQLite Spinner **Android Web service** JSON Parsing, Rest api and methods **Android Multimedia**	9P

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	MediaPlayer: Audio VideoView: Video		

5.	**Small project like**
	    1. Tutorials app
	    2. News reading app
	    3. College notice reading app
	    4. Blog reading app
	    etc.
			6P

Total			**36P**

Course Outcomes:	
After completion of the course, students will be able to:	
1.	understanding the fundamentals of Android operating systems
2.	demonstrate the skills of using Android software development tools
3.	develop android applications for mobile

Learning Resources:	
1.	Head First Android Development: A Brain-Friendly Guide by David Griffiths
2.	Android Programming for Beginners: Build in-depth, full-featured Android 9 Pie apps starting from zero programming experience by, John Horton

Course Name:	**On Job Training**		
Course Code:	OJT481		
Semester:	IV	**Credit:**	15
L-T-P:	Sessional	**Pre-Requisites:**	
Full Marks:	200		
Examination Scheme:	Training in Semester: 200		

Training Scheme:
Students will go for an industrial training in the semester end for one month. After completion of the training, they will prepare a report and provide a presentation on the training in front of faculty members. On the basis of their report and presentation they will be evaluated.