



AMAL COLLEGE
OF ADVANCED STUDIES

LEARNING OUTCOMES- BASED CURRICULUM FRAMEWORK FOR UNDERGRADUATE EDUCATION

**BACHELOR OF VOCATION (B.Voc.)
IN**

MOBILE APPLICATION DEVELOPMENT

CBCSSVUG2021 – LRP (Language Reduced Pattern)

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**DEPARTMENT OF B.Voc. MOBILE APPLICATION
DEVELOPMENT**



AMAL COLLEGE OF ADVANCED STUDIES

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Aided by Govt. of Kerala & affiliated to the University of Calicut NAAC Accredited with A Grade (3.11 CGPA)

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PREFACE

We are delighted to introduce the Learning Outcome Based Curriculum Framework for the Bachelor of Vocation in Mobile Application Development programme, which is offered by the Department of Computer Science at Amal College of Advanced Studies, Nilambur. This document embodies our institution's vision and mission, guiding us toward academic excellence and reaffirming our commitment to providing comprehensive and forward-looking education.

Amal College's vision aims to establish an advanced learning center that nurtures personal transformation, social empowerment, and excellence in the field of computer science. Our mission centers on delivering quality education, shaping responsible citizens, fostering research and innovation, and equipping students with essential life skills. These core principles influence the development of this curriculum.

The Bachelor of Vocation in Mobile Application Development programme at Amal College is designed to empower students to make a transformative impact on the world through the realms of computer science and technology. The program takes a pioneering approach in both teaching and research, aiming to cultivate future leaders equipped with the skills to adeptly navigate the intricacies of the digital world, specifically focusing on mobile application development.

This curriculum outlines the Bachelor of Vocation in Mobile Application Development programme, its aims, graduate attributes, Program Learning Outcomes, course-level learning outcomes, CLO-PLO Mapping, teaching and learning methodologies, and assessment techniques. It reflects our commitment to providing transformative education that aligns with the needs of today's rapidly evolving technological landscape. This framework will guide our faculty and students as we continue our educational journey.

We express our appreciation to all those who contributed to its development.

Warm regards,

Dr. Zacaria T V

Principal

Amal College of Advanced Studies, Nilambur

18/05/2022

VISION AND MISSION OF AMAL COLLEGE OF ADVANCED STUDIES

VISION

The vision of Amal College is to establish an innovative learning institution that catalyses personal transformation, leads community upliftment, and motivates individuals to attain the highest levels of excellence.

MISSION

- **Education Excellence:** We are committed to deliver in high-quality education in a nurturing and inclusive environment.
- **Responsible Citizens:** Our goal is to prepare our youth to become responsible citizens with a deep sense of patriotism.
- **Research and Innovation:** We encourage and support research and innovation to nurture students as contributors to our nation.
- **Global Competency:** We strive to establish collaborative partnerships with high- standard institutions, enhancing the global competitiveness of both our institution and our scholars.
- **Life Skills:** We empower our students with essential life skills that not only transform their own lives but also uplift their communities.
- **Community Empowerment:** We are dedicated to promoting social and educational empowerment in our community through extension and outreach programs.
- **Inclusion and Sustainability:** We are committed to fostering sustainable development and advocating for inclusiveness of all sections of the society.

VISION AND MISSION OF DEPARTMENT OF B.VOC. MOBILE APPLICATION DEVELOPMENT

VISION

Our vision is to emerge as a pioneering force in the realm of B.Voc. Mobile Application Development education, research, and innovation. We envision cultivating a dynamic learning ecosystem that not only disseminates state-of-the-art technical expertise but also nurtures problem-solving acumen and sparks creativity. Our commitment lies in shaping graduates who can take the lead in the continually evolving landscape of mobile application development, ensuring they are well-equipped to navigate and excel in the dynamic digital sphere.

MISSION

Our mission in the B.Voc. Mobile Application Development program is driven by the following key objectives:

1. **Delivering a Comprehensive Educational Experience:** We are dedicated to providing a well-rounded educational journey that integrates rigorous academic learning with creativity and the cultivation of ethical values. Our aim is to equip students to navigate the dynamic landscape of mobile application development with a solid foundation in both theory and practical skills.
2. **Empowering Individual Potential:** Our mission is to empower each student to recognize and leverage their unique strengths and skills. We foster an environment that encourages creativity, critical thinking, and innovation, allowing students to thrive and make a meaningful impact in the dynamic world of mobile app development.
3. **Providing Personalized Career Guidance:** We are committed to offering personalized career guidance, assisting students in making well-informed choices for their future within the diverse realms of mobile application development. Whether their aspirations lie in research, industry, entrepreneurship, or other paths, we aim to support them in achieving their career goals.

4.Ensuring Transparent and Equitable Assessment: We uphold a transparent, equitable, and efficient assessment system. Our evaluation processes are designed to fairly gauge students' knowledge and skills, providing them with opportunities to showcase their true potential in the field of mobile application development.

5.Leveraging Information Technology: We strive to harness the full potential of information technology in knowledge dissemination. Our commitment to incorporating the latest technological advancements in education and research ensures that students are well-prepared to navigate the rapidly changing landscape of the digital world, particularly in the context of mobile app development.

Through this mission, the B.Voc. Mobile Application Development program aims to lead in mobile application education, research, and innovation while nurturing a community of skilled, creative, and socially responsible mobile app developers.

INTRODUCTION TO BACHELOR OF VOCATION (B.VOC.) IN MOBILE APPLICATION DEVELOPMENT

The University Grants Commission (UGC) has launched a scheme on 27 February, 2014 for skill development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exits such as Diploma /Advanced Diploma /Degree under the NSQF. B.Voc. Mobile Application Development is a vocational undergraduate program with 3 years duration. Considering the implementation modalities, the guidelines of the scheme have been revised in the years 2015 and 2018. The B.Voc. programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles and their NOSs along with broad based general education. This would enable the graduates completing B.Voc. to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

The curriculum framework for the Undergraduate Bachelor of Vocation (B.Voc.) program in Mobile Application Development is intricately crafted to offer a versatile and comprehensive structure. This framework provides institutions with the flexibility to tailor the program to meet

the distinctive needs of students while remaining responsive to the dynamic landscape of technology and mobile application development. The intention behind this framework is to uphold the quality and standards of B.Voc. Mobile Application Development degrees nationwide, facilitating regular reviews within a broad framework that includes agreed-upon graduate attributes, qualification descriptors, program learning outcomes, and course-level learning objectives.

It's crucial to highlight that this framework does not seek to standardize syllabi for Mobile Application Development programs, nor does it impose specific teaching methods or assessment procedures. Instead, it aims to foster an environment that promotes adaptability and innovation in program design, syllabus development, teaching and learning approaches, as well as the assessment of student learning outcomes. This adaptability is paramount to ensure that graduates are well-equipped to thrive in the ever-evolving landscape of mobile application development and technology.

CHARACTERISTICS AND SCOPE OF THE UNDERGRADUATE PROGRAM IN BACHELOR OF VOCATION IN MOBILE APPLICATION DEVELOPMENT

The Bachelor of Vocation in Mobile Application Development programme is an interdisciplinary course that explores the vast and dynamic intersection of computer science, Computer application and technology. In this programme students explore and examine the advanced concepts of programming mobile applications along with the programming languages generally used for the development of various software applications. The Bachelor of Vocation in Mobile Application Development programme places a strong emphasis on experiential learning, offering opportunities for internships, research projects, and exposure to industry best practices. This focus on practical experience equips graduates with the skills and knowledge needed to excel in the ever-evolving and competitive world of computer science, computer applications and technology.

The curriculum extends to cutting-edge topics like artificial intelligence, machine learning, and Internet of Things (IoT), where students delve into advanced technologies and practices. Additionally, this program emphasizes problem-solving and analytical skills, covers effective communication in a technical context, and introduces students to the ethical and legal aspects

of computer science and applications. Furthermore, students have the opportunity to engage in real-world projects, which allows them to apply their knowledge and tackle complex challenges in the field of computer science and computer applications.

The program aims to shape students with adequate skills in Mobile Application Development by providing sufficient theoretical knowledge, lab experiments, training in academic projects, and involvement in real-time client projects, especially during the 6th-semester full-time internship in industries. This will enable students to be hired in public and private IT organizations.

B.VOC. MOBILE APPLICATION DEVELOPMENT PROGRAMME – OBJECTIVE

1. Highly-Skilled Software Development:

The course aims to equip students with in-depth skills and knowledge in mobile application development, ensuring they can effectively contribute to the creation of software solutions for diverse platforms, including Android, iOS, and web applications.

2. Judicious Mix of Skills and General Education:

The program seeks to strike a thoughtful balance, offering students not only specialized skills in mobile application development but also a well-rounded education that includes essential elements of general education. This ensures graduates are not only technically proficient but also possess a broader understanding of various subjects.

3. Integration with Industries for Work Readiness:

The curriculum is designed in collaboration with industry partners, incorporating real-world applications and scenarios. This integration ensures that students are well-prepared for the demands of the workplace and can seamlessly transition into professional roles upon completion of the program.

4. Flexibility Through Entry and Exit Points:

The program is structured to allow students flexibility in their academic journey. Pre-defined entry and exit points enable students to enter or leave the program at different stages, recognizing their achievements and allowing for personalized learning paths.

5. Integration of NSQF for Employability:

The course aligns with NSQF standards, ensuring that graduates possess skills that are nationally recognized and meet industry benchmarks. This alignment enhances their employability, making them valuable contributors to the workforce, both locally and globally.

6. Vertical Mobility for Vocational Students:

The program is designed to offer progression opportunities for students who have pursued vocational subjects in their earlier education (10+2) or through Community Colleges. This vertical mobility ensures a seamless transition into higher education, allowing them to build upon their vocational knowledge in the field of mobile application development

GRADUATE ATTRIBUTES

The Job Roles, Qualification Packs and NSQF Levels proposed to be covered in each year.
Reference: <http://www.nsdindia.org/nos>

<i>IT-ITeS Sector Skill Council (SSC): NASSCOM</i>		
QP Code	Job Roles and Descriptions	NSQF Level
<i>At the end of 1st Year</i>		
<i>(NSQF Level 6)</i>		
SSC/Q0508	Junior Software Developer Entry level roles in the software industry including support and help desk, testing, user interaction design, maintenance, enhancement, development and documentation.	Level 4
SSC/Q2212	Domestic Data Entry Operator Maintain proper entry of required data of customers through use of various data entry softwares and techniques.	
SSC/Q0110	Domestic IT Helpdesk Attendant Managing and resolving client queries / issues primarily through telephonic calls	

SSC/Q1301	<p>Test Engineer</p> <p>Responsible for conducting scheduled and unscheduled tests in the areas of integration, performance, and application etc.</p>	Level 5
SSC/Q0503	<p>Web Developer</p> <p>Responsible for designing and maintaining web-based applications that include static and dynamic content. This includes the design, layout and coding of a website.</p>	
SSC/Q0504	<p>Media Developer</p> <p>Responsible for designing and improving the look and feel, functionality and graphic appeal of the developed application.</p>	
<p><i>At the end of 1st Year</i> (NSQF Level 6)</p>		
SSC/Q0508	<p>Junior Software Developer</p> <p>Entry level roles in the software industry including support and help desk, testing, user interaction design, maintenance, enhancement, development and documentation.</p>	Level 6
SSC/Q2212	<p>Domestic Data Entry Operator</p> <p>Maintain proper entry of required data of customers through use of various data entry softwares and techniques.</p>	
SSC/Q0110	<p>Domestic IT Helpdesk Attendant</p> <p>Managing and resolving client queries / issues primarily through telephonic calls</p>	
SSC/Q1301	<p>Test Engineer</p> <p>Responsible for conducting scheduled and unscheduled tests in the areas of integration, performance, and application etc.</p>	

SSC/Q0503	<p>Web Developer</p> <p>Responsible for designing and maintaining web-based applications that include static and dynamic content. This includes the design, layout and coding of a website.</p>	
SSC/Q0504	<p>Media Developer</p> <p>Responsible for designing and improving the look and feel, functionality and graphic appeal of the developed application.</p>	
<i>At the end of 3rd Year (NSQF Level 7)</i>		
SSC/Q0501	<p>Software Developer</p> <p>Responsible for using specialized knowledge of software programming languages, software integration and delivery platforms to build software products and deliver business solutions.</p>	Level 7
SSC/Q1302	<p>QA Engineer</p> <p>Design and implement Quality Assurance norms, standards and guidelines to be followed across the organization</p>	
SSC/Q0502	<p>UI Developer</p> <p>Responsible for designing User interface for the developed application</p>	
SSC/Q0701	<p>Analyst</p> <p>Understand the client’s business requirements and translate them into technology requirements for the technology consultants. They act as facilitators in the process of suctioning and development of the end product/service.</p>	
SSC/Q0201	<p>Application Maintenance Engineer</p> <p>Responsible for ensuring the availability of an application or product for end users. Such roles provide on-going/ad-hoc support for software products or customized applications aimed towards</p>	

	correction of faults/bugs or improvement of performance.	
SSC/Q0507	Engineer Trainee Responsible for supporting the work area/domain they are aligned to by assisting in performing the key activities and tasks involved.	
SSC/Q0401	Junior Data Associate Responsible for designing and implementing processes and layouts for complex, large-scale data sets used for modeling, data Management, manipulation, and research purposes.	
SSC/Q1101	Sales and Pre-Sales Analyst Support business development activities such as coordination with stakeholders, creating proposals and bids for project sales	
SSC/Q0901	Security Analyst Ensure the confidentiality, integrity and availability of system and data to the 'right' users within/outside of the organization.	
SSC/Q0905	Analyst End Point Security Responsible for troubleshooting and maintaining EPS solutions as well as assisting in installing and configuring EPS solutions as per instructions, when required.	
SSC/Q0909	Analyst Security Operations Centre Responsible for monitoring, analyzing and responding to alarms, raising tickets, follow-up for closure of tickets and any enhancements to existing information security measures.	
SSC/Q0904	Analyst Identity and Access Management	

	Responsible for implementing, maintaining, provisioning and reconciling identity and access management to information technology and data	
SSC/Q0912	Penetration Tester Responsible for testing, identifying vulnerabilities, recording the test results, making reports and enhancing the existing tools and security services.	
SSC/Q0903	Analyst Application Security Responsible for analyzing application deployment architecture, security controls & taking corrective actions	
SSC/Q0907	Analyst Compliance Audit Responsible for conducting compliance audit, reporting and addressing risk issues.	

PROGRAMME LEARNING OUTCOMES FOR B.VOC. MOBILE APPLICATION DEVELOPMENT

The Bachelor of Vocation in Mobile Application Development programme enables students to attain, by the time of graduation:

PLO1:	Knowledge and Skill	Improve their computer literacy, their basic understanding of operative systems and a working. Knowledge of software and hardware commonly used in academic and professional environments.
PLO2:	Analysis and Comprehension	The Systems Analysis and Design (SAD) paradigm is employed to systematically address programming, database, and web design issues in the Information Technology domain. By fostering effective teamwork and professional behaviour, it guides the software development life cycle, encompassing requirements gathering,

		design, coding, testing, deployment, and maintenance, all while emphasizing adherence to ethical and professional standards in software development.
PLO3:	Design and Develop	Enable students to proficiently design, develop, and deploy mobile applications for iOS and Android platforms, database-driven websites, and software solutions using cutting-edge cloud technologies, emphasizing real-world scenarios, security considerations, and fostering a commitment to continuous learning.
PLO4:	Society and Environment	Graduates will demonstrate the ability to foster team success by prioritizing mental health hygiene, cultivating positive work environments, enhancing communication, and promoting resilience, contributing to overall team well-being and significant achievements in the software industry.
PLO5:	Critical thinking and Problem Solving	Create, select and apply appropriate techniques, resources, mathematical and professional business skills and Modern IT Tools to complex software engineering activities and business presentations.
PLO6:	Communication and Leadership	Provide with a field placement to get hands-on experience as a professional app developer and build industry connections by doing internships in industries. Graduates will excel as entrepreneurs, creating mobile applications and web-based software solutions to propel their collaborators to new levels of success.

<p>PLO7:</p>	<p>Technology and Research</p>	<p>Equip the graduate to go for their higher studies, that is after acquiring B.Voc., there is further educational opportunity to go for M.Voc., MCA, MSc Computer Science, MBA, MTech etc.</p>
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COURSE LEARNING OUTCOMES FOR B.VOC. MOBILE APPLICATION DEVELOPMENT

The Course Learning Outcomes (CLOs) for the B.Voc. Mobile Application Development program articulate clear and succinct statements that outline the essential knowledge and skills students are expected to acquire within the scope of each course. These outcomes play a central role in shaping the curriculum, guiding the selection of appropriate teaching methodologies, and structuring assessments. Through this alignment, CLOs ensure a seamless connection with the overarching program objectives. This meticulous integration aims to cultivate an effective and immersive educational experience, empowering students to develop a comprehensive understanding of mobile application development. The intended outcome is to equip them with the skills and knowledge necessary to navigate the demands and opportunities presented by the dynamic and ever-evolving technological landscape specific to mobile applications.

ABOUT CLO-PLO MAPPING

CLO-PLO Mapping, or Course Learning Outcomes to Program Learning Outcomes Mapping, is a systematic approach in higher education that connects the specific objectives of individual courses (Course Learning Outcomes or CLOs) to the overarching goals of an academic program (Program Learning Outcomes or PLOs). This process is crucial for ensuring the alignment and coherence of the curriculum and assessment methods.

By mapping CLOs to PLOs, educators can track how well course objectives contribute to the broader educational goals of a program. It provides transparency and clarity, enabling instructors and institutions to evaluate the effectiveness of their curriculum design, teaching methods, and assessment strategies.

The benefits of CLO-PLO Mapping include enhanced program quality, improved assessment practices, and a better understanding of whether students are achieving the intended learning outcomes. It also aids in identifying areas where curriculum adjustments may be needed to better meet program objectives. Additionally, it supports accreditation and quality assurance efforts, as it provides evidence of alignment between courses and program goals.

In essence, CLO-PLO Mapping is a valuable tool for promoting educational excellence, ensuring students receive a comprehensive and coherent education, and facilitating continuous improvement in academic programs.

SEMESTER I

SDC1MD01– DISCRETE MATHEMATICS

- Course Number** : 1.4
- Contact Hours per Week** : 4L
- Number of Credits** : 4
- Number of Contact Hours** : 64 Hrs.
- Course Evaluation** : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Understanding Set Theory: students should be able to demonstrate a comprehensive understanding of set theory, including set notation, set operations, set equivalence, and set cardinality.
- CO2** : Combinatorial Problem Solving: Students should be proficient in solving combinatorial problems, including the ability to calculate permutations, combinations, and apply various counting principles to real-world scenarios.
- CO3** : Graph Theory Proficiency: Upon completion of the course, students should have a strong grasp of graph theory, including the analysis of graphs, identification of paths, cycles, and connectivity, and solving problems related to graph theory.
- CO4** : Logical Reasoning and Propositional Logic: Students should be able to apply principles of propositional logic, construct truth tables, and use logical reasoning to evaluate and solve logical problems.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	-	-	2	-	1
CO2	-	-	-	-	1	-	1
CO3	-	-	-	-	2	-	1
CO4	-	-	-	-	2	-	-
WT. AVG					1.75		1.00
Overall Mapping of Subject							1.38

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC1MD02– PROBLEM SOLVING USING C

Course Number : 1.5
Contact Hours per Week : 4L
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Familiar with fundamental concepts of Computer hardware and software.
- CO2** : Demonstrate the algorithm and flow chart for the given problem.
- CO3** : Understand the problem-solving aspect.
- CO4** : Acquire the basic knowledge about Computer system and Programming.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	-	-	-	-	-	-
CO2	-	2	3	-	3	-	-
CO3	2	3	-	-	2	-	-
CO4	-	-	-	-	3	3	2
WT. AVG	2.50	2.50	3.00		2.67	3.00	2.00
Overall Mapping of Subject							2.61

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC1MD03– WEB DEVELOPMENT USING PHP

Course Number : 1.6
Contact Hours per Week : 4L
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Analyses a web page and identify its elements and attributes.
- CO2** : Create web pages using HTML5 and Cascading Style Sheets and Java Scripts.
- CO3** : Design and develop a webpage with Hyperlinks.
- CO4** : Deploy dynamic webpages using Php scripts with PostgreSQL and MySQL database engines.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	3	2	-	1	-	-
CO2	2	2	-	-	3	-	-
CO3	3	-	3	-	-	-	-
CO4	1	-	2	-	-	-	3
WT. AVG	2.00	2.50	2.33		2.00		3.00
Overall Mapping of Subject							2.37

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC1MD04 (P) – C PROGRAMMING - LAB

Course Number : 1.7
Contact Hours per Week : 4P
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Enhance their analysing and problem-solving skills and use the same for writing programs in C.
- CO2** : Students should develop practical programming skills in the C language. They should be able to write, compile, and debug C programs, and understand the fundamental syntax and structure of the language.
- CO3** : Through various lab exercises and assignments, students should improve their ability to design and implement algorithms to solve real-world problems. This includes skills in problem decomposition, logical thinking, and algorithm development.
- CO4** : Learning to write clean, well-documented, and maintainable code is an essential outcome.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	-	-	-	-	-	-
CO2	2	-	-	-	-	-	-
CO3	-	2	3	-	3	-	-
CO4	-	-	2	-	-	-	2
WT. AVG	2.00	2.00	2.50		3.00		2.00
Overall Mapping of Subject							2.30

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC1MD05 (P) – WEB DEVELOPMENT USING PHP – LAB

Course Number : 1.8
Contact Hours per Week : 4P
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Students should be able to create and structure web pages using HTML and CSS to build visually appealing and responsive user interfaces. This includes understanding the principles of HTML semantics, CSS layout, and responsive design techniques.
- CO2** : Students should gain a strong foundation in JavaScript programming, enabling them to create interactive and dynamic web applications. This includes knowledge of event handling, DOM manipulation, and working with JavaScript libraries.
- CO3** : Students should be able to develop server-side applications using PHP. This includes writing scripts to handle form submissions, interact with databases, and manage user sessions. Students should also understand PHP security best practices.
- CO4** : Students should be able to design and implement a relational database using MySQL, including creating tables, defining relationships, and writing SQL queries to retrieve and manipulate data. They should also understand how to connect their web applications to the MySQL database and perform CRUD (Create, Read, Update, Delete) operations.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	3	-	-	-	2
CO2	-	2	-	-	3	-	-
CO3	-	-	2	-	-	-	-
CO4	-	-	3	-	-	-	-
WT. AVG		2.00	2.67		3.00		2.00
Overall Mapping of Subject							2.42

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SEMESTER II

SDC2MD06– DATABASE MANAGEMENT SYSTEM

Course Number : 2.4
Contact Hours per Week : 4L
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Mastery of database design, including schema creation, table structures, and relationships for effective data organization.
- CO2** : Proficiency in implementing and managing diverse DBMS technologies, such as SQL and distributed databases.
- CO3** : Capability in administrating and maintaining database systems, covering backups, performance tuning, and disaster recovery planning.
- CO4** : Adeptness in utilizing databases for data analysis and reporting, extracting valuable insights from large datasets.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	3	-	-	-	-	-
CO2	-	2	-	-	-	-	-
CO3	-	-	3	-	1	-	-
CO4	-	2	-	-	-	-	1
WT. AVG		2.33	3.00		1.00		1.00
Overall Mapping of Subject							1.83

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC2MD07– INTRODUCTION TO OOPS USING JAVA

Course Number : 2.5
 Contact Hours per Week : 4L
 Number of Credits : 4
 Number of Contact Hours : 64 Hrs.
 Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1 : Gaining proficiency in Java programming, including data types, variables, and basic syntax. Class and Object Concept: Mastery of creating and using classes and objects to model real-world entities.
- CO2 : Grasping the concepts of inheritance and polymorphism for code reusability and flexibility. Understanding encapsulation and abstraction to manage data and simplify complex systems.
- CO3 : Proficiency in handling exceptions and errors in Java programs. Familiarity with using Java's standard libraries for common tasks.
- CO4 : Learning basic software development practices, including coding standards and debugging. Developing the ability to apply OOP principles to solve real-world problems.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	-	3	-	-	-	-
CO2	-	-	2	-	-	-	-
CO3	-	-	-	-	3	-	-
CO4	1	1	3	-	-	-	2
WT. AVG	1.00	1.00	2.67		3.00		2.00
Overall Mapping of Subject							1.93

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC2MD08 (P) – DATABASE MANAGEMENT SYSTEM - LAB

Course Number : 2.6
 Contact Hours per Week : 3P
 Number of Credits : 3
 Number of Contact Hours : 48 Hrs.
 Course Evaluation : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

CO1 : Students should be able to design and implement a relational database. This outcome may include creating an Entity-Relationship Diagram (ERD), defining tables and their relationships, and implementing the database using a database management system like MySQL, Oracle, or Microsoft SQL Server.

CO2 : Students should be proficient in writing SQL queries to retrieve, update, and manipulate data in the database. They should also be able to manage database transactions, ensuring data integrity and consistency.

CO3 : Students should gain hands-on experience in database administration tasks. This may include creating and managing user accounts, setting up security and access controls, and performing regular maintenance activities such as backup and recovery.

CO4 : Students should be able to develop database-driven applications. This includes integrating a database with programming languages like Java, Python, or PHP, and building applications that interact with the database to perform tasks such as data retrieval, insertion, and updating.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	-	-	1	-	-
CO2	-	3	-	-	-	-	2
CO3	-	2	2	-	-	-	-
CO4	-	1	2	-	-	-	-
WT. AVG		2.00	2.00		1.00		2.00
Overall Mapping of Subject							1.75

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC2MD09 (P)– JAVA PROGRAMMING - LAB

Course Number : 2.7
Contact Hours per Week : 3P
Number of Credits : 3
Number of Contact Hours : 48 Hrs.
Course Evaluation : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

- CO1** : Students should be able to demonstrate a fundamental understanding of Java programming concepts, including variables, data types, control structures (such as loops and conditionals), and basic object-oriented programming principles.
- CO2** : Students should be able to develop algorithms and implement Java code to solve a variety of programming problems. This may include tasks like writing programs to manipulate data, perform calculations, or solve real-world problems.
- CO3** : Students should gain hands-on experience in software development, including writing, testing, and debugging Java code. They should be able to identify and fix common programming errors and understand debugging techniques.
- CO4** : Students should be able to design and implement Java classes and objects, understand the concepts of inheritance, encapsulation, and polymorphism, and demonstrate the ability to use Java's OOP features effectively in their programs.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	-	2	-	-	-	-
CO2	-	2	3	-	-	-	2
CO3	-	-	-	-	3	-	1
CO4	1	1	2	-	-	-	-
WT. AVG	1.00	1.50	2.33		3.00		1.50
Overall Mapping of Subject							1.87

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC2MD10 (PR) – MINI PROJECT (INCLUDING INDUSTRIAL VISIT)

Course Number : 2.8
 Contact Hours per Week : 4P
 Number of Credits : 4
 Number of Contact Hours : 64 Hrs.
 Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1 : Developing hands-on skills in application development by working on real-world projects. Demonstrating the ability to identify and solve complex problems encountered during application development.
- CO2 : Fostering teamwork and effective collaboration with peers on project assignments. Learning project management principles to plan, execute, and complete application development projects efficiently.
- CO3 : Prioritizing user experience and interface design in application development. Proficiency in using version control tools to manage and track code changes.
- CO4 : Mastery of testing and debugging techniques to ensure application reliability. Emphasizing the importance of documenting the development process for future reference. Developing the ability to effectively present and communicate project outcomes.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	-	-	-	-	-	2
CO2	-	1	-	1	2	-	2
CO3	-	-	3	-	-	-	-
CO4	-	-	-	-	-	-	3
WT. AVG	2.00	1.00	3.00	1.00	2.00		2.33
Overall Mapping of Subject							1.89

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SEMESTER III

A11– BASIC MATHEMATICS AND GENERAL AWARENESS

Course Number : 3.1
 Contact Hours per Week : 4L
 Number of Credits : 4
 Number of Contact Hours : 64 Hrs.
 Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1 : Apply numerical and reasoning skills in competitive examinations.
 CO2 : Understand some basic concepts of research and its methodologies.
 CO3 : Bridge the fundamental skills of computers with the present level of knowledge of the students.
 CO4 : To train and equip the students with the skills of modern banking and insurance.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	-	-	3	-	1
CO2	-	-	-	-	1	-	2
CO3	1	-	-	-	2	-	-
CO4	-	-	-	1	1	-	2
WT. AVG	1.00			1.00	1.75		1.67
Overall Mapping of Subject							1.35

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

A12– PROFESSIONAL BUSINESS SKILLS

Course Number : 3.2
 Contact Hours per Week : 4L
 Number of Credits : 4
 Number of Contact Hours : 64 Hrs.
 Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1 : Able to become a professional by acquiring various soft skills needed for business success
- CO2 : Explore the world of e-learning and also the various consequences of Cyber space and crimes.
- CO3 : Application of data analysis and the role of artificial intelligence in e-business.
- CO4 : Apply the skills of digital marketing and e-commerce.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	-	-	3	3	-	2
CO2	-	-	1	2	-	-	-
CO3	-	-	-	-	-	-	-
CO4	-	-	-	-	-	2	-
WT. AVG	1.00		1.00	2.50	3.00	2.00	2.00
Overall Mapping of Subject							1.92

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC3MD11– SOFTWARE ENGINEERING AND TESTING

Course Number : 3.3
Contact Hours per Week : 3L
Number of Credits : 3
Number of Contact Hours : 48 Hrs.
Course Evaluation : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

- CO1** : Proficiency in analyzing and understanding software requirements to ensure accurate project planning and design.
- CO2** : Mastery in creating efficient software designs and architectures to meet project goals and standards.
- CO3** : Skill in implementing rigorous quality assurance and testing procedures to identify and resolve software defects.
- CO4** : Understanding and applying various phases of the SDLC, from requirements gathering to deployment, for systematic software development.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	2	-	-	-	-	-
CO2	-	3	2	-	-	-	-
CO3	-	-	2	-	-	-	-
CO4	-	3	2	-	1	-	-
WT. AVG	1.00	2.67	2.00		1.00		
Overall Mapping of Subject							1.67

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC3MD12– PYTHON PROGRAMMING

Course Number : 3.4
Contact Hours per Week : 4P
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Learners will attain a high level of proficiency in Python programming, enabling them to write Python code for various applications, including automating tasks, data analysis, and small-scale software development.
- CO2** : Participants will develop strong problem-solving skills and the ability to apply Python to solve real-world challenges, making them more capable of addressing practical problems through programming.
- CO3** : Learners will gain the ability to use Python for data analysis and visualization. This outcome is beneficial for professionals working with data or individuals interested in exploring data-driven insights.
- CO4** : Students will be able to create Python scripts for automating routine tasks, which is particularly valuable for IT professionals, system administrators, and individuals looking to streamline repetitive processes.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	2	-	-	-	-	1
CO2	-	-	-	-	3	-	-
CO3	-	3	-	-	-	-	-
CO4	-	2	3	-	2	-	1
WT. AVG	2.00	2.33	3.00		2.50		1.00
Overall Mapping of Subject							2.17

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC3MD13– ADVANCED OPERATING SYSTEM

Course Number : 3.5
Contact Hours per Week : 4L
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

CO1 : Students should gain a deep understanding of the fundamental design principles and concepts behind modern operating systems. This might include topics such as process management, memory management, file systems, and I/O management.

CO2 : Advanced operating systems often deal with complex issues related to synchronization and concurrency. Students should learn how to design and implement solutions for managing multiple processes and threads concurrently, including topics like deadlock avoidance and resolution.

CO3 : Advanced operating systems often explore the concepts of distributed systems, where multiple computers work together to achieve a common goal. Students may learn about distributed file systems, distributed consensus, and network protocols in this context.

CO4 : Security is a critical aspect of modern operating systems. Students should gain knowledge about security mechanisms, including access control, authentication, and encryption. Additionally, virtualization techniques, which allow multiple operating systems to run on a single physical machine, are often covered in advanced courses.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	-	2	-	-	-	-
CO2	-	2	-	-	-	-	1
CO3	1	-	-	2	-	-	-
CO4	-	2	2	-	1	-	-
WT. AVG	2.00	2.00	2.00	2.00	1.00		1.00
Overall Mapping of Subject							1.67

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC3MD14 (P) – DATA STRUCTURES USING JAVA - LAB

Course Number : 3.6
 Contact Hours per Week : 4(1L+3P)
 Number of Credits : 4
 Number of Contact Hours : 64 Hrs.
 Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1 : List the advantages of the object-oriented programming approach. Explain the advanced programming capabilities of Java.
- CO2 : Classify the types of data Structures. Explain the algorithms associated with each type of data structures
- CO3 : Identify the appropriate data structures to solve different problems.
- CO4 : Implement the algorithms using the advanced features of Java.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	3	-	-	-	-
CO2	2	-	-	-	-	-	-
CO3	-	-	-	-	3	-	-
CO4	2	2	-	-	-	-	-
WT. AVG	2.00	2.00	3.00		3.00		
Overall Mapping of Subject							2.50

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC3MD15 (P) – PYTHON PROGRAMMING - LAB

Course Number : 3.7
Contact Hours per Week : 4P
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Understand and demonstrate a strong grasp of Python's syntax and language features, including variables, data types, control structures (if statements, loops), and functions.
- CO2** : Develop the ability to solve problems using Python, including designing algorithms, writing pseudo code, and implementing solutions in Python code.
- CO3** : Gain experience in software development practices, including code organization, documentation, and debugging techniques. Students should be able to create well-structured Python programs and effectively debug and fix common programming errors.
- CO4** : Apply Python to practical, real-world scenarios and projects. This might include working with data, creating graphical user interfaces, web development, or other domain-specific applications, depending on the focus of the course.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	2	1	-	-	-	-
CO2	-	-	2	-	3	-	-
CO3	-	3	-	-	-	-	-
CO4	-	-	3	-	2	-	1
WT. AVG	1.00	2.50	2.00		2.50		1.00
Overall Mapping of Subject							1.80

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC3MD16 (P) – SOFTWARE ENGINEERING AND DIGITAL MARKETING -LAB

Course Number : 3.8
Contact Hours per Week : 3P
Number of Credits : 3
Number of Contact Hours : 48 Hrs.
Course Evaluation : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

- CO1** : Understand the phases of software projects and practice the activities of each phase.
- CO2** : Practice clean coding, take part in project management, become adept at such skills as distributed version control, unit testing, integration testing, build management, and deployment.
- CO3** : To learn digital marketing tools like search engine optimization and associated analytics.
- CO4** : To apply digital marketing tools to: improve websites' rankings and optimize it in the process, improve the brand's visibility, improve brands reach which physically is relatively difficult and less effective. To analyse relative importance of digital marketing strategies to optimize digital marketing campaign.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	-	-	-	-	-
CO2	-	2	-	-	2	-	-
CO3	-	-	-	-	2	-	1
CO4	-	-	2	1	-	2	-
WT. AVG		2.00	2.00	1.00	2.00	2.00	1.00
Overall Mapping of Subject							1.67

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SEMESTER IV

A13– ENTREPRENEURSHIP DEVELOPMENT

Course Number : 4.1
Contact Hours per Week : 4L
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Able to understand the nature of entrepreneurship and the financial assistance and guidance from the govern.
- CO2** : Confirm an entrepreneurial business idea.
- CO3** : Explore entrepreneurial leadership and management style.
- CO4** : Confidence in Setting up of Industrial unit.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	-	-	2	3	-
CO2	-	1	-	-	2	-	1
CO3	-	-	-	-	-	3	-
CO4	-	2	-	-	-	-	1
WT. AVG		1.50			2.00	3.00	1.00
Overall Mapping of Subject							1.88

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

A14– PUBLIC HEALTH, SANITATION & SAFETY

Course Number : 4.2
Contact Hours per Week : 4L
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Students should gain a fundamental understanding of public health principles, including the determinants of health, the importance of disease prevention, and the role of public health in promoting and protecting the health of communities.
- CO2** : Students should develop knowledge about sanitation practices and their importance in preventing the spread of diseases. This includes understanding how to maintain clean and safe environments in various settings, such as homes, healthcare facilities, and public spaces.
- CO3** : Students should be able to identify and explain safety regulations and guidelines relevant to public health and sanitation. This might include knowledge of food safety standards, workplace safety regulations, and environmental health regulations.
- CO4** : Students should learn how to assess and mitigate public health risks. This involves the ability to identify potential health hazards in different environments and develop strategies to minimize or eliminate these risks.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	-	3	-	-	-
CO2	-	-	-	2	-	2	-
CO3	-	-	-	2	-	-	-
CO4	1	-	-	-	-	-	1
WT. AVG	1.00			2.33		2.00	1.00
Overall Mapping of Subject							1.58

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC4MD17– INTRODUCTION TO ANDROID DEVELOPMENT

Course Number : 4.3
Contact Hours per Week : 4L
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

CO1 : Students should gain a solid understanding of the Android operating system and its architecture, including the key components like activities, services, broadcast receivers, and content providers. They should be able to explain how these components work together to create Android applications.

CO2 : Students should be able to design, develop, and deploy basic Android applications. This includes creating user interfaces using XML layouts and Java code, handling user input, and navigating between different screens or activities within an app.

CO3 : Students should become proficient in using Android development tools like Android Studio, the official integrated development environment (IDE) for Android development. They should be able to use these tools to write, test, and debug Android applications.

CO4 : Students should learn best practices for Android app development, including designing user-friendly interfaces, managing app resources efficiently, and handling app lifecycle events. They should also gain knowledge about app deployment to the Google Play Store or other distribution platforms, including creating a signed APK (Android Application Package) and understanding the submission process.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	3	-	3	-	-
CO2	-	-	3	-	-	-	-
CO3	-	-	2	-	2	3	2
CO4	-	2	-	-	-	-	-
WT. AVG		2.00	2.67		2.50	3.00	2.00
Overall Mapping of Subject							2.43

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC4MD18– ADVANCED DATABASE MANAGEMENT SYSTEM - NOSQL

Course Number : 4.4
Contact Hours per Week : 3L
Number of Credits : 3
Number of Contact Hours : 48 Hrs.
Course Evaluation : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

- CO1** : Understand various transaction processing, concurrency control mechanisms and database protection mechanisms.
- CO2** : Differentiate between a relational database and a non-relational (NoSQL) database.
- CO3** : Perform CRUD operations (create, read, update and delete) on data in NoSQL environment.
- CO4** : Students should be able to identify and implement performance optimization techniques for NoSQL databases. This might involve strategies like indexing, caching, load balancing, and partitioning to ensure efficient data retrieval and storage.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	3	-	-	-	-	-
CO2	-	2	-	-	-	-	-
CO3	-	-	3	-	1	-	-
CO4	-	2	-	-	-	-	1
WT. AVG		2.33	3.00		1.00		1.00
Overall Mapping of Subject							1.83

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC4MD19E3– MOBILE ECOSYSTEMS, BUSINESS ANALYSIS AND MODELS

Course Number	: 4.5
Contact Hours per Week	: 3L
Number of Credits	: 3
Number of Contact Hours	: 48 Hrs.
Course Evaluation	: Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

- CO1** : Students should gain a deep understanding of the mobile technology ecosystem, including mobile devices, operating systems, app development, mobile networks, and emerging trends. They should be able to describe the components and stakeholders involved in this ecosystem.
- CO2** : Students should develop the ability to conduct business analysis within the mobile ecosystem. This includes analysing market trends, consumer behaviour, competition, and regulatory factors that impact the mobile industry. They should be able to use various business analysis tools and techniques to make informed decisions.
- CO3** : Students should learn how to create models and frameworks that can support decision-making in mobile-related businesses. This may involve developing financial models, market analysis models, or other types of models that help in planning and strategizing for mobile ventures.
- CO4** : The course should equip students with the skills and knowledge needed to make strategic decisions in the mobile technology space. This includes understanding how to adapt to changing market conditions, identifying opportunities for innovation, and formulating business strategies that leverage the mobile ecosystem.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	-	-	-	-	-	1
CO2	-	-	-	-	2	2	-
CO3	-	-	-	-	-	2	-
CO4	-	2	-	-	-	-	-
WT. AVG	3.00	2.00			2.00	2.00	1.00
Overall Mapping of Subject							2.00

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC4MD20 (P) – INTRODUCTION TO ANDROID- LAB

- Course Number : 4.6
- Contact Hours per Week : 4P
- Number of Credits : 4
- Number of Contact Hours : 64 Hrs.
- Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1 : Use the android framework for creating application.
- CO2 : Demonstrate UI design in the mobile application.
- CO3 : Identify the different components in Android application development environment.
- CO4 : Create an advanced mobile app for a given application.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	3	-	3	-	-
CO2	-	-	3	-	-	-	-
CO3	-	-	-	-	2	3	2
CO4	-	2	-	-	-	-	-
WT. AVG		2.00	3.00		2.50	3.00	2.00
Overall Mapping of Subject							2.50

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC4MD20 (P) – INTRODUCTION TO ANDROID- LAB

Course Number : 4.7
Contact Hours per Week : 4P
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Students should gain a deep understanding of the fundamental concepts and principles of NoSQL databases, including key-value stores, document stores, column-family stores, and graph databases. They should be able to explain the differences between NoSQL databases and traditional relational databases.
- CO2** : Students should gain practical experience in working with popular NoSQL database system MongoDB. This includes tasks like installing, configuring, and managing these databases, as well as performing data manipulation and querying operations.
- CO3** : Students should be able to design and implement data models suitable for NoSQL databases. This involves understanding schema-less data structures, denormalization, and the use of indexes to optimize data retrieval.
- CO4** : Students should learn how NoSQL databases are designed for scalability and how to optimize their performance. This includes concepts like sharing, replication, and the use of caching mechanisms. Students should be able to analyse and address performance bottlenecks in NoSQL database systems.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	-	-	1	-	-
CO2	-	3	-	-	-	-	2
CO3	-	2	2	-	-	-	-
CO4	-	1	2	-	-	-	-
WT. AVG		2.00	2.00		1.00		2.00
Overall Mapping of Subject							1.75

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC4MD22 (PR) – PROJECT WORK / INTERNSHIP

Course Number : 4.8
Contact Hours per Week : 4P
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

CO1 : Developing hands-on skills in application development by working on real-world projects. Demonstrating the ability to identify and solve complex problems encountered during application development.

CO2 : Fostering teamwork and effective collaboration with peers on project assignments. Learning project management principles to plan, execute, and complete application development projects efficiently.

CO3 : Prioritizing user experience and interface design in application development. Proficiency in using version control tools to manage and track code changes.

CO4 : Mastery of testing and debugging techniques to ensure application reliability. Emphasizing the importance of documenting the development process for future reference. Developing the ability to effectively present and communicate project outcomes.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	-	-	-	-	-	2
CO2	-	1	-	1	2	-	2
CO3	-	-	3	-	-	-	-
CO4	-	-	-	-	-	-	3
WT. AVG	2.00	1.00	3.00	1.00	2.00		2.33
Overall Mapping of Subject							1.89

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SEMESTER V

SDC5MD23– INTRODUCTION TO iOS APPLICATION DEVELOPMENT

Course Number : 5.1
Contact Hours per Week : 3L
Number of Credits : 3
Number of Contact Hours : 48 Hrs.
Course Evaluation : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

- CO1** : Students should be able to demonstrate a fundamental understanding of iOS app development, including the use of XCode, Interface Builder, and Swift programming language. They should be able to create simple iOS applications with user interfaces and functionality.
- CO2** : Students should be able to design user-friendly and visually appealing user interfaces for iOS applications. This includes the use of Interface Builder and understanding the principles of designing for mobile devices.
- CO3** : Students should be proficient in Swift, the primary programming language used for iOS app development. They should be able to write and understand Swift code, including variables, data structures, control flow, and basic object-oriented programming concepts.
- CO4** : Students should understand the process of deploying iOS applications to the App Store or for testing on physical devices. This includes topics like code signing, provisioning profiles, and the submission process.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	3	-	3	-	-
CO2	-	1	3	-	-	-	-
CO3	-	-	2	-	2	3	2
CO4	-	2	-	-	-	-	-
WT. AVG		1.67	2.67		2.50	3.00	2.00
Overall Mapping of Subject							2.37

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC5MD24– MOBILE ARCHITECTURE AND APP DEVELOPMENT

- Course Number** : 5.2
- Contact Hours per Week** : 3L
- Number of Credits** : 3
- Number of Contact Hours** : 48 Hrs.
- Course Evaluation** : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

- CO1** : Gain a deep understanding of the fundamental concepts and components of mobile network architecture, including cellular network technologies (e.g., 4G, 5G), network protocols, and communication protocols (e.g., TCP/IP, HTTP). Describe the roles and functions of key network elements such as base stations, mobile core networks, and routers in facilitating mobile data transmission.
- CO2** : Understanding paradigms and tools in mobile app development. Mobile app evolution and future trends. Client-server architecture for mobile apps. Best practices in mobile programming.
- CO3** : Comprehensive understanding of web architecture. Proficiency in mobile web development. Dynamic content management skills.
- CO4** : Understand mobile OS fundamentals. Proficiency in major mobile OS features. Compare different mobile OSs. Adaptability to diverse platforms. Prepare for innovation and integration.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	1	-	-	-	-	-
CO2	-	2	1	-	2	-	-
CO3	-	-	1	-	-	-	-
CO4	1	2	1	-	-	-	-
WT. AVG	1.50	1.67	1.00		2.00		
Overall Mapping of Subject							1.54

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC5MD25– DATA ANALYSIS USING PYTHON

Course Number : 5.3
Contact Hours per Week : 3L
Number of Credits : 3
Number of Contact Hours : 48 Hrs.
Course Evaluation : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

- CO1** : Students will demonstrate the ability to manipulate and analyse data efficiently using Python, including data cleaning, pre-processing, and organizing.
- CO2** : Proficiency in conducting exploratory data analysis, employing statistical methods, and creating informative visualizations to extract insights from datasets.
- CO3** : Students will master the application of mathematical and statistical concepts in data analysis, including the development and application of statistical models to infer patterns, relationships, and trends within datasets.
- CO4** : Students will gain proficiency in developing machine learning models, understanding the key steps in the model development lifecycle, and evaluating model performance using appropriate metrics and techniques.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	2	-	-	-	-	1
CO2	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	-
CO4	-	3	2	-	-	-	-
WT. AVG	2.00	2.67	2.00				1.00
Overall Mapping of Subject							1.92

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC5MD26– VIRTUALIZATION AND CLOUD SECURITY

Course Number : 5.4

Contact Hours per Week : 3L

Number of Credits : 3

Number of Contact Hours : 48 Hrs.

Course Evaluation : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

CO1 : Students will demonstrate proficiency in managing cloud infrastructure, including provisioning, scaling, and optimizing resources in cloud environments.

CO2 : Knowledge in Cloud Trust Protocol & Transparency and Cloud Controls Matrix.

CO3 : Basics of virtualization and Cloud Security.

CO4 : Understanding Legal Aspects in impacting Cloud Security and Privacy.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	1	2	-	-	-	-
CO2	-	-	3	-	-	-	-
CO3	-	-	2	-	-	-	1
CO4	-	-	1	-	-	-	-
WT. AVG		1.00	2.00				1.00
Overall Mapping of Subject							1.33

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC5MD27E1– MACHINE LEARNING

Course Number : 5.5
Contact Hours per Week : 3L
Number of Credits : 3
Number of Contact Hours : 48 Hrs.
Course Evaluation : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

- CO1** : The students will be able to understand machine learning concepts.
- CO2** : They also get the essential mathematical and statistical foundations of machine learning.
- CO3** : Provides a thorough grasp of both parametric and non-parametric methods for classification and regression.
- CO4** : Students learn to evaluate and choose models based on dataset characteristics, preparing them for effective problem-solving in real-world scenarios.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	-	-	2	-	-
CO2	-	-	-	-	2	-	-
CO3	-	2	-	-	1	-	-
CO4	-	-	2	-	3	-	-
WT. AVG		2.00	2.00		2.00		
Overall Mapping of Subject							2.00

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC5MD28 (P) – iOS APPLICATION DEVELOPMENT

Course Number : 5.6
Contact Hours per Week : 3P
Number of Credits : 3
Number of Contact Hours : 48 Hrs.
Course Evaluation : Internal–15Marks +External–60Marks

COURSE LEARNING OUTCOMES

- CO1** : Illustrate sample codes on iOS development environment.
- CO2** : Identify the basic concepts in iPad, iPhone development.
- CO3** : Create a simple mobile application.
- CO4** : Start developing your own iOS apps with confidence.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	3	-	3	-	-
CO2	1	-	-	-	3	-	-
CO3	-	-	3	1	2	-	2
CO4	-	2	-	-	-	-	2
WT. AVG	1.00	2.00	3.00	1.00	2.67		2.00
Overall Mapping of Subject							1.94

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC5MD29 (P) – SWIFT PROGRAMMING

Course Number : 5.7
Contact Hours per Week : 4(1L+3P)
Number of Credits : 4
Number of Contact Hours : 64 Hrs.
Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1** : Illustrate sample codes on Swift programming.
- CO2** : Identify the basic concepts in iPad, iPhone development.
- CO3** : Create a simple mobile application.
- CO4** : Start developing your own iOS apps with confidence

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	3	-	3	-	-
CO2	1	-	-	-	3	-	-
CO3	-	-	2	-	2	-	2
CO4	-	2	-	-	-	-	2
WT. AVG	1.00	2.00	2.50		2.67		2.00
Overall Mapping of Subject							2.03

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC5MD30 (P) – MEAN/MERN STACK DEVELOPER

Course Number : 5.8
 Contact Hours per Week : 4(1L+3P)
 Number of Credits : 4
 Number of Contact Hours : 64 Hrs.
 Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1 : Illustrate sample codes on MEAN/MERN Stack development.
- CO2 : Identify the basic concepts cross platform development.
- CO3 : Create a simple mobile application.
- CO4 : Start developing your own iOS apps with confidence.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	3	-	3	-	-
CO2	-	-	-	-	2	-	-
CO3	-	-	2	-	2	-	2
CO4	-	2	-	-	-	-	1
WT. AVG		2.00	2.50		2.33		1.50
Overall Mapping of Subject							2.08

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC5MD31 (P) – FLUTTER DEVELOPER - LAB

Course Number : 5.9
 Contact Hours per Week : 4(1L+3P)
 Number of Credits : 4
 Number of Contact Hours: 64 Hrs.
 Course Evaluation : Internal–20Marks +External–80Marks

COURSE LEARNING OUTCOMES

- CO1 : Illustrate sample codes on Dart.
- CO2 : Illustrate code on Flutter.
- CO3 : Identify the basic concepts cross platform development.
- CO4 : Create a simple and cross platform mobile application.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	2	3	-	3	-	-
CO2	-	-	-	-	2	-	-
CO3	-	-	-	-	2	-	2
CO4	-	2	-	-	-	-	1
WT. AVG		2.00	3.00		2.33		1.50
Overall Mapping of Subject							2.21

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SEMESTER VI

SDC6MD32– TERM PAPER

Course Number : 6.1
Number of Credits : 2
Course Evaluation : Internal–50Marks

COURSE LEARNING OUTCOMES

- CO1** : The student will gain in-depth knowledge of a specific area in computer science, focusing on mobile application development through an extensive literature survey.
- CO2** : Engaging in a comprehensive literature review will enhance the student's research and analytical skills, fostering the ability to critically evaluate existing literature and identify research gaps.
- CO3** : The process will contribute to enhanced problem-solving abilities by providing a broader perspective on challenges and solutions within the chosen domain.
- CO4** : Through synthesizing complex information and working under faculty supervision, the student will develop effective communication skills and experience professional growth, setting the stage for potential future research endeavours.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	3	-	-	-	-
CO2	-	-	-	-	2	-	3
CO3	-	-	-	-	2	-	-
CO4	-	-	-	-	-	3	-
WT. AVG			3.00		2.00	3.00	3.00
Overall Mapping of Subject							2.75

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

SDC6MD33 (PR) – INTERNSHIP AND PROJECT

Course Number : 6.2
Total Hours : 840 Hrs
Number of Credits : 28
Course Evaluation : Internship 200Marks [Internal: 40, External: 160]
 Project 200Marks [Internal: 40, External: 160]

COURSE LEARNING OUTCOMES

- CO1** : Ability to integrate existing and new technical knowledge for industrial application.
- CO2** : Acquire interpersonal, communication and other critical skills in the job interview process.
- CO3** : Develop work habits and attitudes necessary for job success.
- CO4** : Real time work experience helps to get placed easily.

CO PO MAPPING							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	-	1	-	2	-	2
CO2	-	1	-	1	2	3	2
CO3	-	-	-	3	-	-	-
CO4	-	-	-	-	-	1	3
WT. AVG	2.00	1.00	1.00	2.00	2.00	2.00	2.33
Overall Mapping of Subject							1.76

In the matrix above, use the following correlation levels: "1" – Slight (Low) Correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) Correlation, "-" indicates there is no correlation.

TEACHING LEARNING PROCESS

The teaching and learning methodology for our B.Voc. Mobile Application Development program is meticulously crafted to be dynamic and responsive to the rapidly evolving landscape of mobile technology. Striking a balance between traditional and contemporary approaches, we tailor our methods to cater to the diverse learning styles and requirements of our students. Our pedagogical strategy incorporates a mix of classroom lectures enriched with both traditional and cutting-edge information and communication technology (ICT) tools, ensuring a comprehensive understanding of mobile app development.

Active engagement is a cornerstone of our methodology, manifesting through coding assignments, student-led seminar presentations, and immersive field experiences. These approaches not only foster critical thinking but also provide practical insights into the realm of mobile application development. Assessment is a vital component, featuring unit tests, discussions, debates, and role-playing exercises, empowering students to apply their acquired knowledge effectively.

Embracing the flexibility and accessibility of online classes, facilitated by a robust learning management system, we cater to varying learning paces, offering additional support through remedial classes and encouraging advanced learners with self-study assignments.

The pinnacle of our B.Voc. Mobile Application Development program is the project work in the final semester. This capstone experience affords students the opportunity to apply their skills in real-world scenarios, consolidating their learning journey. Through this holistic teaching and learning approach, our goal is to equip B.Voc. Mobile Application Development students with a well-rounded education, preparing them for success in the dynamic and competitive global landscape of mobile application development.

ASSESSMENT METHODS

The assessment methods for the B.Voc. Mobile Application program encompass both Continuous Internal Evaluation (CIE) and External Evaluation (EE). CIE constitutes 20% of the total evaluation and involves a variety of components, including assignments, presentations, attendance, and two internal tests, designed to assess students' ongoing performance. The remaining 80% weightage is attributed to EE, which consists of 2.5-hour written examinations conducted at the conclusion of each semester.

In addition, the program culminates with a viva voce examination, specifically for project work/Internship in the final semester. These assessment methods collectively ensure a thorough evaluation process that combines continuous engagement, external examinations, and practical project assessments to comprehensively assess students' knowledge, skills, and understanding in the field of computer science. This multifaceted approach is designed to provide a holistic evaluation of students' capabilities and their readiness to excel in the dynamic realm of Mobile Application Development.

CONCLUSION

In conclusion, the Learning Outcome Based Curriculum Framework for the B.Voc. Mobile Application Development program serves as a strategic guidepost, intricately aligning program objectives with well-defined course learning outcomes and providing a clear trajectory toward academic distinction. This comprehensive framework not only encapsulates our educational vision but also outlines precise, measurable learning objectives, reaffirming our commitment to upholding the highest academic standards and nurturing a new generation of experts in mobile application development. Through the structured implementation of this framework, our goal is to empower students with the knowledge, skills, and adaptability essential for success in the dynamic and ever-evolving landscape of mobile app development. It stands as the cornerstone for academic rigor, innovation, and continuous improvement, ensuring our students are not only well-prepared but also poised to thrive in the competitive and evolving technological realm of mobile application development. This framework represents our unwavering commitment to excellence and sets the stage for the continual growth and success of our B.Voc. Mobile Application Development program.



DEPARTMENT OF B.Voc.

MOBILE APPLICATION DEVELOPMENT

AMAL COLLEGE OF ADVANCED STUDIES NILAMBUR

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