

Khandesh College Education Society's
Institute of Management and Research, Jalgaon
(An Autonomous Institute affiliated to Kavayitri Bahinabai Chaudhari North
Maharashtra University, Jalgaon and Recognized by AICTE, New-Delhi)

NEP-2020 Based CBCS
PROGRAM STRUCTURE AND SYLLABUS
Of
Master of Computer Application [Integrated]
MCA (Integrated)
(2024-2029)

Department of MCA (Integrated)
School of Computer Applications

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Eligibility Criteria:

Passed 10+2 examination with Mathematics/ Statistics/ Accountancy as compulsory subjects. Obtained at least 45% marks (40% marks in case of candidates belonging to reserved category) in the above subjects taken together.

Admission Process:

1. A Common Entrance Examination procedure will be adopted for admission to MCA(Integrated) First Year Course.

a. Eligibility for Appearing for Appearing MAH-B.BCA/BBA/BMS/BBM/Integrated MCA/Integrated MBA –CET.

- Passed 10 + 2 (HSC) or its equivalent examination (As per the AICTE APH 2024 - 2028)
- Candidates appearing for 10 + 2 (HSC) or its equivalent examination are also eligible to appear for CET

- b. Online registration of application and uploading of required documents by the

Candidate for admission on website

2. Documents verification and confirmation of Application Form for Admission by online mode.
3. Display of the provisional merit list for Maharashtra State/All India candidates on website.
4. Submission of grievances if any, for all type of Candidates
5. Display of the Final Merit lists of Maharashtra State/All India candidates on website

PROGRAMME STRUCTURE & CREDIT DISTRIBUTION

Vision

To become a preferred Institute in the field of computer science and technology, imparting relevant skills and knowledge to the students to meet emerging global challenges.

Mission

1. To impart up-to-date technical knowledge.
2. To develop students into successful professionals with analytical, logical and computational skills to provide sustainable solutions.
3. To expose students to the current trends and opportunities in local as well as global IT Industry.
4. To inculcate professional responsibility with an inherent ethical value system.
5. To cultivate innovative thinking and research culture among students.

Name of the Programme:

Master of Computer Application [Integrated]

Objective of the Programme:

1. Develop a deep understanding of computer science and its real-world applications, including programming languages, data structures and algorithms, computer networks, databases, and software engineering.
2. Gain practical experience in software development by designing, implementing, and testing software systems using industry-standard tools and technologies.
3. Build critical thinking and problem-solving skills to tackle complex challenges in computer science and develop innovative solutions with cutting-edge technologies.
4. Develop effective communication, collaboration, and teamwork skills to work effectively in diverse and interdisciplinary environments.
5. Acquire knowledge and skills in emerging areas of computer science, such as artificial intelligence, machine learning, computer vision, cybersecurity, and big data analytics, to stay current with the rapidly evolving technological landscape.

Description of the Programme:

The Master of Computer Applications (Integrated) (MCA Integrated) program is designed to provide students with a comprehensive understanding of the field of

computer science and its applications in various industries. MCA Integrated program incorporates the recently implemented National Education Policy (NEP) of 2020, which aims to transform the Indian education system and promote holistic development among students.

- MCA Integrated program is structured to equip students with the necessary knowledge and skills in computer science, programming, software development, and information technology. It offers a blend of theoretical concepts and practical training, enabling students to apply their learning to real-world scenarios.
- Students will be given opportunities for multidisciplinary and interdisciplinary education through options to choose courses of their interests from other schools/departments within the institute.
- The total credits for 5-year MCA Integrated will be 224 credits.
- 20% of the courses may be offered online from SWAYAM.
- Academic Bank of Credits (ABC) will be established to facilitate Transfer of Credits. The credits earned at various levels will get credited into a digitalized ABC. Students can use their earned credits to take admission in another institution to further continue their studies for the remaining year/s of their graduation.

The Programme Highlights:

Program Highlights: Master of Computer Applications [Integrated] (MCA Integrated)
Program:

- **Discipline-Specific Courses (Core Major Courses):** The MCA Integrated program places a strong emphasis on core major courses that form the foundation of computer science and applications. These courses provide in-depth knowledge and understanding of essential subjects such as programming languages, database management, software engineering, web development, data structures, algorithms, and computer networks.
- **Interdisciplinary Minor Courses (IDC):** The MCA Integrated program recognizes the importance of interdisciplinary learning and offers students the opportunity to explore other related fields. Through eight interdisciplinary minor courses, students can broaden their horizons and gain insights from areas such as mathematics, statistics, business management, or communication.
- **Generic/Open Elective Course (OE):**
 - i. It is to be offered in I and/or II year

- ii. Faculty-wise baskets of OE shall be prepared by University/ Autonomous Colleges.
 - iii. OE is to be chosen compulsorily from faculty other than that of the Major. Further, Students will be able to earn maximum 4 Credits in this Vertical through International/National/Zone/State/University level participation and achievements in co-curricular and academic activities.
- **Vocational Skill Course (VSC):** Wherever applicable vocational courses will include skills based on advanced laboratory practical of Major and/or Minor. A student is required to successfully complete the ‘vocational skill course’ as mentioned in the schemes of teaching, learning and evaluation, examination. This course must be a course corresponding to the major and/ or Minor subject selected by a student.
 - **Ability Enhancement Courses (AEC):** AEC courses are designed to enhance students' abilities and competencies beyond their core subject knowledge. In the BCA program, students will engage in three AEC courses, which focus on areas such as communication skills, logical reasoning, analytical thinking, and entrepreneurial skills. These courses consist of eight hours of instruction each.
 - **Skill Enhancement Courses (SEC):** In the rapidly evolving field of computer applications, it is essential for students to acquire industry- relevant skills. The MCA Integrated program offers three skill enhancement courses to help students develop specific technical skills in areas such as programming frameworks, software tools, data analytics, or cybersecurity. Each SEC course involves nine hours of instruction.
 - **Common Value-Added Courses (VAC):** The MCA Integrated program recognizes the importance of holistic development and incorporates three common value- added courses. These courses cover topics such as personality development, ethics, sustainability, and social responsibility. By participating in these courses, students cultivate a sense of social consciousness and ethical decision-making. Each VAC course comprises six hours of instruction.
 - **Value Education Course (VEC):** A student is required to undergo and successfully complete the Value Education Courses like yoga, environment, cleanliness etc.
 - **Field Project (FP) / On the Job Training (OJT) /Community Engagement Project (CEP) / Research Project (RP):** A student is required to undergo and successfully complete this course under the guidance of supervisor/mentor assigned by the HEI. This course must be corresponding to the major. This course must be completed at the HEI where the student has taken admission and transfer of credit is not permissible for this type of course. The project and internship component consists

of 16 weeks, ensuring students gain practical industry experience.

- **Department Electives (DSE):** To cater to individual interests and specialization within the field of computer applications, the MCA Integrated program offers four department electives. These elective courses allow students to delve deeper into specific areas of computer science, such as artificial intelligence, mobile app development, cloud computing, or data science. The number of hours of instruction for each DSE course may vary based on the chosen elective.
- **Indian Knowledge System (IKS):** Gain an understanding of Indian Knowledge System. Develop an ability to apply the IKS to societal challenges faced today in areas such as holistic health, governance, public administration and sustainable living.
- **Co-Curricular Course (CC):** A student is required to select a Co-Curricular Courses like NSS, Sports, Cultural etc. This course must be completed at the Higher Education Institute (HEI) where the student has taken admission and transfer of credit is not permissible for this type of course.
- **Community engagement and service (CEP):**
By incorporating these diverse components into the MCA Integrated program, aim to provide students with a well-rounded education, equipping them with the necessary knowledge, skills, and practical experience to excel in the field of computer applications

Pedagogy for MCA Integrated Program:

The Master of Computer Applications [Integrated] (MCA Integrated) program adopts a student-centered and practical approach to learning, ensuring that students actively engage in the learning process and develop a strong foundation in computer science and applications. The pedagogy is designed to be simple yet effective, promoting holistic development and preparing students for successful careers in the field of computer applications.

- **Interactive Classroom Sessions:** The program fosters interactive classroom sessions where students actively participate in discussions, ask questions, and engage in problem-solving exercises. The faculty encourages student involvement and creates a supportive learning environment.
- **Hands-on Lab Sessions:** Practical sessions in well-equipped computer labs are an integral part of the MCA Integrated program. Students get hands-on experience with programming languages, software development tools, and other technologies. Lab

exercises and projects allow them to apply theoretical concepts and gain practical skills.

- **Case Studies and Real-world Examples:** The pedagogy includes the use of case studies and real-world examples to demonstrate the application of concepts. By analyzing real-life scenarios and exploring practical solutions, students develop critical thinking and problem-solving skills.
- **Project-based Learning:** The MCA Integrated program incorporates project-based learning, where students work on individual or group projects that simulate real-world scenarios. This approach enhances their teamwork, communication, and project management abilities while applying their knowledge to solve complex problems.
- **Industry Interaction:** The program encourages industry interaction through guest lectures, workshops, and industry visits. Professionals from the IT industry share their experiences, insights, and current trends, giving students a glimpse into the practical aspects of the field.
- **Internships and Practical Training:** The MCA Integrated program emphasizes internships and practical training opportunities. Students have the chance to work with industry partners, gaining hands-on experience, and applying their skills in real work environments. This exposure enhances their understanding of industry practices and prepares them for future employment.
- **Continuous Assessments:** Regular assessments, including quizzes, assignments, and presentations, help evaluate students' progress and understanding of the subject matter. Feedback is provided to guide their learning and address any gaps in understanding.
- **Technology Integration:** The program leverages technology as a learning tool. Online resources, educational software, and virtual labs are utilized to enhance students' understanding of concepts and provide additional learning opportunities.
- **Mentoring and Guidance:** Faculty members act as mentors, providing individual guidance and support to students. They assist in setting academic goals, clarifying doubts, and offering career advice to ensure students' overall growth and success.
- **Collaborative Learning:** The MCA Integrated program promotes collaborative learning through group projects, discussions, and peer-to-peer interactions. Students learn from each other, exchange ideas, and develop teamwork and communication skills.

The pedagogy of the MCA Integrated program aims to create a dynamic and engaging

learning environment, enabling students to acquire theoretical knowledge, practical skills, and a problem-solving mindset. By incorporating these simple yet effective teaching strategies, the program equips students with the necessary competencies to thrive in the field of computer applications.

Five Year MCA (Integrated) Programme

The 5-year MCA Integrated degree will be 224. Following types of courses will be offered for a 5-Year MCA Integrated Programme:

- 24 Discipline-specific Major Courses (88 credits)
- 8 Discipline Specific Electives (30 credits)
- 1 Research Methodology (4 credit)
- 5 Minor Courses (18 credits)
- 6 Open Electives (12 credits)
- 4 Ability Enhancement Courses (8 credits)
- 3 Skills Enhancement Courses (6 credits)
- 2 Value Education Courses (4 credits)
- 4 Vocational Skill Courses (8 credits)
- 1 Indian Knowledge System (2 credits)
- 4 Co-curricular courses (8 credits)
- 1 Community Engagement and Project (2 credits)
- 2 On Job Training (16 credits)
- 2 Field Project (4 credits)
- 1 Research Project (6 credits)
- 1 Mooc's (8 Credits)

Outcome Based Approach to Education (OBE):

As per the National Higher Education Qualification Frameworks (NHEQF), students are expected to possess the quality & characteristics of the graduate of a Programme of the study, including learning outcomes relating to the disciplinary areas, learning generic outcomes that are expected to be acquired by a graduate on completion of the Programme.

OBE is an educational model that forms the base of a quality education system. There is no specified style of teaching or assessment in OBE. All educational activities carried out in OBE should help the students to achieve the set goals. The faculty may adapt the role of an instructor, trainer, facilitator, and/or mentor based on the outcomes targeted. OBE enhances

the traditional methods and focuses on what the institute provides to the students. It shows the success by making or demonstrating outcomes using statements 'able to do' in favor of students. It provides clear standards for observable and measurable outcomes.

Four Levels of Outcomes from OBE

1. Programme Educational Objectives (PEOs)
2. Programme Outcomes (POs)
3. Programme Specific Outcomes (PSOs)
4. Course Outcomes (COs)

Graduate Attributes

The graduate attributes include the learning outcomes that are specific to disciplinary areas relating to the chosen field(s) of learning within the broad multidisciplinary & interdisciplinary learning outcomes that graduates of all Programmes should acquire & demonstrate.

<u>Graduate Attributes</u>	
1.	Disciplinary Knowledge
2.	Critical Thinking & Problem Solving
3.	Creativity & Innovation
4.	Effective Communication
5.	Research-related skills
6.	Cooperation & Team Work
7.	Global/Multicultural Competence
8.	Ethics & Human Values
9.	Lifelong Learning
10.	Leadership Readiness
11.	Community Engagement & Social Responsibilities
12.	Digital literacy

Programme Educational Objectives (PEOs):

Programme Educational Objectives (PEOs) are defined for the aspiring students about what they will achieve once they join the Programme. PEOs are about professional and career accomplishment after 5 years of graduation. PEOs are the written statements taken from different aspects like Knowledge, Skills & Ethics with focus on Career, Competency and Behavior. Three PEOs are recommended for MCA(Integrated) Programme.

Program Educational Objectives (PEOs):

PEO1.	Use Modern tools and technologies for software development.
PEO2.	Develop software solutions to problems across a broad range of application domains through analysis and design. Contribute to research of their chosen field and function and communicate effectively, to perform both individually and in a multi-disciplinary team.
PEO3.	Continue the process of life-long learning through professional activities; adapt themselves with ease to new technologies, while exhibiting high ethical and professional standards.

Programme Outcomes (POs):

A Programme outcome is broad in scope and defines what the students will be able to do at the end of the Programme. POs are defined in line with the graduate attributes as specified above. POs are to be specific, measurable and achievable.

Programme Outcomes (POs):

PO1	Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems.
PO2	Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.
PO3	Ability to transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies.
PO4	Ability to devise and conduct experiments, interpret data and provide well informed conclusions.
PO5	Ability to select modern computing tools, skills and techniques necessary for innovative software solutions
PO6	Ability to apply and commit professional ethics and cyber regulations in a global economic environment.
PO7	Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.
PO8	Ability to understand, management and computing principles with computing knowledge to manage projects in multidisciplinary environments.
PO9	Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.
PO10	Ability to recognize economic, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice.
PO11	Ability to work as a member or leader in diverse teams in multidisciplinary environment.
PO12	Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.

Program Specific Outcomes (PSOs):

Program Specific Outcomes (PSOs)

PSO1.	Professionally skilled and trained in the field of computer science, they can solve complex, real-time problems, which help them grow personally and professionally.
PSO2.	Understanding modern computer technologies and their applications to solve complex and critical issues that benefit society and the environment.
PSO3.	Trained to perform effectively as an individual, a team, and as a teamleader in a multidisciplinary environment using critical thinking skills.

Programme Specific Outcomes (PSOs) are statements that describe what the graduates of a specific Programme should be able to do. A list of 3 PSOs have been defined for the Integrated MCA Programme.

Mapping of PEOs with POs:

MAPPING OF PEO WITH PO												
PEO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO1	3	3	3	2	3	2	2	2	2	2	2	2
PEO2	3	3	3	3	3	2	2	2	2	2	2	2
PEO3	2	2	2	2	2	3	3	3	3	3	3	3

Level of correlation: 3-High, 2-Medium, 1-Low

Semester Wise Credit Distribution of Proposed MCA (Integrated) Program

KCES's Institute of Management & Research Proposed Structure for MCA[Integrated] AY-2024-25

GENERAL COURSE STRUCTURE & THEME

A. Definition of Credit:

1 Hr. Lecture (L) per week	1 Credit
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1 Hr. Tutorial (T) per week	1 Credit
1 Hr. Practical (P) per week	0.5 Credit
2 Hours Practical (P) per week	1 Credit

B. Course code and definition:

Course code	Definitions
L	Lecture
T	Tutorial
P	Practical
DSC	Discipline Specific Core Course
OE	Open Elective
VSC	Vocational Skill Courses
SEC	Skill Enhancement courses
AEC	Ability Enhancement Courses
VEC	Value Education Courses
IKS	Indian Knowledge System
CC	Co-curricular Course
Minor	Minor subject
FP	Field Project
CEP	Community Engagement and Project
DSE	Discipline Specific Elective
OJT	On Job Training: Internship/ Apprenticeship
RM	Research methodology
RP	Research Project
MOOCs	Massive Open Online Course

C. Credit distribution:

Ye ar s	Le ve l	Sem	Major(Core) Subjects		Mino r	O E	VSC, SEC (VSE C)	AEC, VEC, IKS	OJT, FP,C EP,C C,RP	Cu m. Cr/ Se mes ter	Degree/ Cumul ative Credit
			Mand atory (DSC)	Electiv e (DSE)							
I	4. 5	I	4 – 6 (4+2)			2+	VSC- 2 SEC- 2	AEC- 2 VEC- 2 IKS-2	CC-2	20- 22	40-44
		II	4 – 6 (4+2)		2	2+	VSC- 2 SEC- 2	AEC- 2 VEC- 2	CC-2	20- 22	
		Cu m.C r.	8 - 12		2	8	8	10	4	40- 44	
Credit After I st Year			8-12		2	8	8	10	4	40	40 - 44
II	5	III	6 (4+2) – 8(2*4)		4	2	VSC- 2	AEC- 2	FP-2 CC-2	20- 22	40-44
		IV	6		4	2	SEC- 2	AEC- 2	CEP- 2 CC-2	20- 22	
		Cu m.C r.	8-12		8	4	4	4	8	40- 44	
Credit After II nd Year			20-22		10	12	12	14	12	80- 88	80 - 88
III	5. 5	V	8(2*4) – 10(2*4 +2)	4	4-6		VSC- 2-4		FP/C EP-2	20	40-44
		VI	8(2*4) – 10(2*4 +2)	4	4				OJT- 4	20	
		Cu m.C r.	16-20	8	8-10		2		6	40- 44	
Credit After III rd Year			36-48	8	18-20	12	14	14	18	120 - 132	120- 132
IV	6	VII	18-22	4						22- 26	44-52
		VIII	10-14	8					RM-4	22- 26	
		Cu m.C r.	28-36	12					4	44- 52	

Credit After IV th Year			64-84	20	18-20	12	14	14	22	164 - 184	164-184
V	6.5	IX	6-8	10-12					RP:6	22-26	40-46
		X		MOOC S-6-8				OJT-12		18-20	
		Cum.C r.	6-8	16-20				12	6	40-46	
Credit After V th Year			70-92	36-40	18-20	12	14	26	28	204 - 230	204-230

Category- wise distribution*

Description	DSC	DSE	OE	Minor	VSC	SEC	AEC	VEC	IKS	OJT	FP	CEP	CC	RM	RP	MOOCS	Total
MCA (Integrated)	88	30	12	18	8	6	8	4	2	16	4	2	8	4	6	8	224

Note: Students can take extra credit course from their own department or from other department as per the Admitting Body / University norms.

Proposed Syllabus Structure

KCES's Institute of Management and Research, Jalgaon										
An Autonomous Institute, Affiliated to KBC, North Maharashtra University, Jalgaon										
Course: MCA(Integrated)										
Academic Year: 2024-25										
MCA(Integrated) – First Year, SEMESTER – I, Level – 4.5										
Class	Sem	Type	Course Code	Title	Credit	Teaching Hours per week		Marks(Total 100)		Common Subjects
						T	P	Internal	External	
FY	I	DSC	IMCA-DSC-111	Programming in C	4	4	--	40	60	
		DSC	IMCA-DSC-112	Lab on Programming in C	2	--	2	20	30	
		OE	IMCA-OE-113-A	Principles of Management	2	2	--	20	30	
			IMCA-OE-113-B	Principles of Accounting-I						
		OE	IMCA-OE-114-A	Digital Marketing I	2	2	--	20	30	
			IMCA-OE-114-B	Personals Financial Planning-I						
		VSC	IMCA-VSC-115	Web Technology-I	2	--	2	20	30	
		SEC	IMCA-SEC-116	Computer Fundamentals	2	2	--	20	30	
		AEC	IMCA-AEC-117	Mathematics for Computer Application-I	2	2	--	20	30	
		VEC	VEC-101	Environment Science and Sustainability	2	2	--	20	30	Same as BCA and BBA
		IKS	IKS-102	Indian Knowledge System	2	2	--	20	30	Same as BCA and BBA
		CC	CC-100	Sports/NSS/Cultural Activities	2	2	--	20	30	Same as BCA and BBA
			Total Credits	22	18	4	550			

MCA(Integrated) – First Year, SEMESTER – II, Level – 4.5

FY	II	DSC	IMCA-DSC-121	Object Oriented Programming Concepts using C++	4	4	--	40	60	
		DSC	IMCA-DSC-122	Lab on OOPS Concepts using C++	2	--	2	20	30	
		Minor	IMCA-MIN-123	System Analysis and Design	2	2	--	20	30	
		OE	IMCA-OE-124-A	Marketing Management	2	2	--	20	30	
			IMCA-OE-124-B	Principles of Accounting-II						
		OE	IMCA-OE-125-A	Digital Marketing II	2	2	--	20	30	
			IMCA-OE-125-B	Personals Financial Planning-II						
		VSC	IMCA-VSC-126	Web Technology-II	2	--	2	20	30	
		SEC	IMCA-SEC-127	Operating System concepts with Linux Lab	2	2	--	20	30	
		AEC	IMCA-AEC-128	Mathematics for Computer Application-II	2	2	--	20	30	
		VEC	VEC-201	Indian Constitution	2	2	--	20	30	Same as BCA and BBA
		CC	CC-200	Sports/NSS/Cultural Activities	2	2	--	20	30	Same as BCA and BBA
		Total Credits	22	18	4	550				

Semester I

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: I

IMCA-DSC-111 Programming in C

Course Title: Programming in C

Course Type: DSC

Course Code: IMCA-DSC-111

Total Credits: 04

Lectures: Tutorials: Practical: 4:0:0

CIE Marks: 40

Lecture Hours: 48 Hours

ESE Marks: 60

Course Description:

The "Programming in C" course introduces students to the fundamental concepts of programming using the C language. It covers topics such as data types, operators, control structures, functions, arrays, pointers, and file handling. The course emphasizes problem-solving techniques and algorithmic thinking, providing a strong foundation for developing efficient and structured programs. Students will gain hands-on experience through practical exercises and projects, preparing them for more advanced programming courses and real-world applications.

Course Objectives:

- The objective of this course is to provide a broad overview of problem solving techniques and use of c language programming to solve these problems.
- To Know the Basics Of Programming and To Understand how to use programming in day to day Applications.
- Explain use of appropriate data types, control statements.
- Demonstrate ability to use top-down program design.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	--	--	✓	--	✓	✓

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Recall fundamental concepts of C programming, including syntax, data types, operators
CO2	Apply appropriate control structures to solve problems such as decision making and repetitive tasks.
CO3	Analyze the concept of function scope, recursion, and the importance of modular programming.
CO4	Evaluate the effectiveness of different data handling techniques (e.g., arrays, pointers, string) in solving particular problems.
CO5	Explain the difference between structures and unions and their memory allocation
CO6	Design and implement complex C programs that integrate multiple concepts, such as file handling.

SN	Contents of Module	Hrs	COs
1	UNIT -I Introduction to Programming in C 1.1 History 1.2 Compilers and Interpreters	10	CO1

<i>SN</i>	<i>Contents of Module</i>	<i>Hrs</i>	<i>COs</i>
	1.3 Structures of 'C' Programming 1.4 C Tokens, Keywords, Identifiers, Variables 1.5 Constant, Data Types ,Variables and constants 1.6 Precedence and Associativity 1.7 Types of operators- arithmetic operators, relational operators, logical operators, Bit wise operators, increment, decrement operators, assignment operators, compound assignment operator, conditional expression, special operators. 1.8 Input and Output 1.9 Pre-processor directives in C		
2	UNIT -II Control structures 2.1 Decision making structures 2.2 If, if else 2.3 Nested If -else 2.4 Switch 2.5 Control structures 2.6 While 2.7 Do-while 2.8 For 2.9 Nested for loop 2.10 Other statements : break ,continue. Goto and exit.	08	CO2
3	UNIT -III FUNCTIONS 3.1 Basic types of function-Built in Functions, User Define Functions 3.2 Declaration and Definition 3.3 Return Keyword 3.4 Function argument (formal arguments, local arguments) 3.5 Function with default argument 3.6 Parameter passing , Call by value , Call by reference 3.7 Storage classes 3.8 Recursion	08	CO3
4	UNIT-IV ARRAY , POINTERS AND STRING 4.1 Array declaration, initialization 4.2 Types – one, two and multidimensional 4.3 What is Pointer?, Pointer declaration, initialization. 4.4 Pointers arithmetic, Pointer to pointer, Arrays of pointers, pointer to function. STRING 4.5 Declaration and initialization 4.6 Standard library functions 4.7 Manipulating Strings 4.8 Strings and pointers 4.9 Array of strings	08	CO4
5	UNIT-V STRUCTURE AND UNION 5.1 Structure Basics 5.2 Creating structures 5.3 Accessing structure members (dot Operator) 5.4 Array of structures 5.5 Nested structures 5.6 Pointer to structure 5.7 Self-referential structure	08	CO5

<i>SN</i>	<i>Contents of Module</i>	<i>Hrs</i>	<i>COs</i>
	5.8 Union 5.9 Difference between structure and union.		
6	UNIT - VI FILE HANDLING 6.1 Types of Files 6.2 Random Access to File 6.3 File handling functions in C 6.4 Operations on files 6.5 File opening modes 6.6 File reading mode 6.7 Writing to file	06	C06

REFERENCE BOOKS:

1. Structured Programming approach using C – Forouzan and Gilberg, Thomson learning Publications
2. Programming in C – E Balaguruswamy ,McGraw Hill Education publication.
3. The C Programming language – 2nd Edition Brian W. Kernighan and Dennis M. Ritchie , Prentice Hall
4. Complete C Reference – Herbert Schildt, McGraw Hill Education publication.

Mapping of Course Outcomes to Program Outcomes:

CO/PO	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
C01	3	2	1	1	2	1	2	1	1	1	1	1
C02	3	3	2	2	2	1	2	1	1	1	1	1
C03	3	3	2	2	2	1	2	1	1	1	1	1
C04	3	3	2	3	3	1	2	1	1	1	1	1
C05	2	2	1	2	2	1	1	1	1	1	1	1
C06	3	3	3	3	3	1	2	2	2	1	1	2

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create
Continuous Internal Evaluation. (40)	✓	✓	✓			✓
End Semester Examination (60)	✓	✓	✓	✓		✓

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: I

IMCA-DSC-112 Lab on Programming in C

Course Title: Lab on Programming in C

Course Type: DSC

Course Code: IMCA-DSC-112

Total Credits: 02

Lectures: Tutorials: Practical: 0:0:2

CIE Marks: 20

Lecture Hours: 24 Hours

ESE Marks: 30

Course Description:

The "Programming in C" course introduces students to the fundamental concepts of programming using the C language. It covers topics such as data types, operators, control structures, functions, arrays, pointers, and file handling. The course emphasizes problem-solving techniques and algorithmic thinking, providing a strong foundation for developing efficient and structured programs. Students will gain hands-on experience through practical exercises and projects, preparing them for more advanced programming courses and real-world applications.

Course Objectives:

- The objective of this course is to provide a broad overview of problem solving techniques and use of c language programming to solve these problems.
- To Know the Basics Of Programming and To Understand how to use programming in day to day Applications.
- Explain use of appropriate data types, control statements.
- Demonstrate ability to use top-down program design.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	--	--	✓	--	✓	✓

Course Outcomes: At the end of the Course, the Student will be able to:

C01	Understand fundamental concepts of C programming, including syntax, data types, operators
C02	Develop C programs using control structures for decision-making and iteration
C03	Analyze the concept of function scope, recursion, and the importance of modular programming.
C04	Evaluate the effectiveness of different data handling techniques (e.g., arrays, pointers, string) in solving particular problems.
C05	Describe the memory allocation differences between structures and unions.
C06	Create and execute intricate C programs that combine several ideas, such file handling.

Assignment No. 1 Input-Output ,Variables, Operators and Data Types

1. Write a Simple Program to Take Input from the User and Display Output on the Screen.
2. Declaring and Using Different Types of Variables in C and Demonstrate the Scope and Lifetime of Local and Global Variables
3. Create a program that demonstrates the use of arithmetic and relational operators by comparing two user-provided numbers and displaying the results of various operations.
4. Write and Execute a Program on Use of Bitwise Operators

Assignment No. 2 Decision Making and Looping Structures

1. W.A.P to check the number is even or odd.
2. W.A.P to find greatest number from given three numbers.
3. W.A.P to check the given number is prime number or not.
4. W.A.P to demonstrate Sum of Natural Numbers.
5. W.A.P to check given number is Armstrong number or not.

Assignment No. 3 Functions

1. W.A.P to find factorial of given number by using user defined function.
2. Write a program to define a function that takes two numbers and returns their sum, difference and multiplication
3. Implement a function that takes two integers as input and returns the greatest common divisor (GCD) of the two numbers.
4. Create a function that calculates the area of a rectangle. The dimensions (length and width) are passed as formal arguments, while the area is calculated using a local variable.
5. Write a program that swaps two numbers using call by value and another using call by reference.
6. Write and Execute a Program on Recursive functions that returns Fibonacci series of given range.

Assignment No.4 Array and Pointer

1. Write a C program that adds the elements of an array and displays the sum.
2. Create a program that takes an array of integers, calculates the sum and average of its elements using pointers, and prints the results.
3. Write C program that includes a function to find the maximum element in a 2D matrix and returns its value along with its position (row and column indices)
4. Write a program that demonstrates pointer arithmetic by accessing and modifying array elements using pointer expressions.
5. Write a program where a pointer points to the first element of an array. Use pointer arithmetic to access and modify elements of the array.
6. Create a function that accepts an array and its size as arguments, and prints the elements of the array.
7. Write a C Program to demonstrate all the string functions.

Assignment No.5 Structure and Union

1. Define a structure to represent a student with fields for name, age, and grade. Write a program to input and display these details.
2. Create a structure to represent a book with fields for title, author (as another structure), and publication year. Implement a program to input and display the book details.
3. Define a union that can store an int, float, or char. Create an instance of this union, set a value, and print the value. Demonstrate how setting one member affects the others.
4. Implement a program to print the size of a structure and a union with the same members. Compare and explain the differences in size.

Assignment No.6 File Handling

1. Write a program to open a file for writing, write a few lines of text to it, close the file, and then reopen it to read and display the contents.

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create
Continuous Internal Evaluation. (40)	✓	✓	✓		✓	✓

End Semester Examination (60)	✓	✓	✓	✓	✓	✓
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KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: I

IMCA-OE-113-A Principles of Management

Course Title: Principles of Management

Course Type: OE

Course Code: IMCA-OE-113-A

Total Credits: 02

Lectures: Tutorials: Practical: 2:0:0

CIE Marks: 20

Lecture Hours: 24 Hours

ESE Marks: 30

Course Description:

The course provides a comprehensive introduction to the fundamental concepts and practices of management. It explores the essential functions of management, including planning, organizing, leading, and controlling, and examines how these functions are applied in various organizational settings. Students will learn about key management theories, decision-making processes, and the roles and responsibilities of managers.

Course Objectives:

The subject aims to provide the student with:

1. To be able to understand the Foundations of Management
2. To learn the Processes of Forecasting, Planning, and Organizing.
3. To develop Skills in Coordination and Decision-Making.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	✓	--	--	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Students will be able to define and describe the nature, features, and functions of management, and critically assess whether management is a science, art, or profession.
CO2	Students will demonstrate the ability to effectively forecast, plan, and organize by applying the principles and processes learned to real-world management scenarios.
CO3	Students will develop the ability to coordinate activities and make informed decisions within an organizational context, ensuring alignment with strategic goals and efficient management operations.

SN	Contents of Module	Hrs	COs
1	Unit 1. Nature and Process of Management 1.1. Definition, Nature and Features of Management 1.2. Management-Science or Art 1.3. Management as Profession 1.4. Functions of Management 1.5. Nature of Management Functions 1.6. Functions at Various Management Levels	8	CO1
2	Unit 2. Planning & Organizing 2.1. Meaning, Definition & Importance of Planning	8	CO2

SN	Contents of Module	Hrs	COs
	2.2. Essentials of Effective Planning 2.3. Steps of Planning 2.4. Meaning, Objectives of organizing 2.5. Meaning, Definition & Importance Staffing, Directing and Controlling		
3	Unit 3. Co-ordination & Decision making 3.1. Co-Ordination 3.2. The Essence of Management 3.3. Techniques of Effective Co-Ordination 3.4. Meaning of decision making 3.5. Process of decision making	8	C03

REFERENCE BOOKS:

1. Principles of Management: T. Ramasamy, Himalaya.
2. Principles of Management: Dr. K Natarajan & Dr. K. P. Ganeshan. Himalaya.
3. Management Process: Koontz & O'Donnell, Tata-McGraw-Hill publishers Delhi.
4. Management of System: By A. K. Gupta & J. K. Sharma, Mac-Millan Publication, Delhi.
5. Principles of Management: Prakash Kothari, B. J. Lathi, Atharv Publication, Jalgaon.
6. Management & Organizational Behavior–By P. SubbaRao, Himalaya publication.
7. Business Organization & Management–By R.N. Gupta, Sultan Chand & Sons publication, Delhi

Mapping of Course Outcomes to Program Outcomes:

CO/PO	P01	P02	P03	P04	P05	P06	P07
CO1	2	2	1	1	2	1	1
CO2	2	2	3	2	3	1	1
CO3	2	2	3	2	3	1	1

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create
Continuous Internal Evaluation.	✓	✓	✓			✓
End Semester Examination (60)	✓	✓	✓			✓

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: I

IMCA-OE-113-B Principles of Accounting-I

Course Title: Principles of Accounting-I

Course Type: OE

Course Code: IMCA-OE-113-B

Total Credits: 02

Lectures: Tutorials: Practical: 2:0:0

CIE Marks: 20

Lecture Hours: 24 Hours

ESE Marks: 30

Course Description:

An accountant is a financial expert specializing in personal and commercial finances. Accountant training teaches the measurement and management of economic data to assist investors, managers, business owners, and other persons in making informed financial decisions. An accounting system is a system that is employed in a company to organize financial information. It can be either manual or computerized. The main reason why you should be using an accounting system is to keep track of expenses, income, and other activities. The course will review foundational accounting principles and concepts that account for current assets, current liabilities, long-term liabilities, and owners' equity. Students will also complete a basic journal statement analysis.

Course Objectives:

- To familiarize students with the mechanics of preparation of financial statements, understanding
- Corporate financial statements, their analysis and interpretation, role of IFRS in accounting
- Discipline, and the concept of management quality analysis and wealth creation.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	--	✓	--	--	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Demonstrate an understanding of the importance of accounting and evaluate the role and benefits of book-keeping, including knowledge of the latest accounting standards.
CO2	Comprehend and apply fundamental concepts of financial accounting.
CO3	Develop and analyze accounting documents, assess the impact of transactions, accurately prepare journal entries, and calculate GST on the purchase and sale of goods.

SN	Contents of Module	Hrs.	COs
1	Unit - I Introduction to Book-keeping and Accountancy 1.1 Meaning, Definition and Objectives 1.2 Importance of Book-keeping. 1.3 Difference between Book-keeping and Accountancy. 1.4 Meaning and Definition of Accountancy 1.5 Basis of Accounting System. Advantages of Financial Accounting, Limitations of Financial Accounting, Users of accounting information.	10	CO1

SN	Contents of Module	Hrs.	COs
	1.6 Qualitative characteristics of accounting information. 1.7 Basic Accounting Terminologies. 1.8 Accounting Concepts, Conventions and Principles. 1.9 Accounting Standards (AS) and IFRS.		
2	Unit – II Meaning and Fundamentals of Double Entry Book-keeping & Fundamentals of accounting. 2.1 Meaning and Definition of Double entry Book-keeping System 2.2 Methods of Recording Accounting Information (Indian, Single, Double) 2.3 Advantages of Double entry Book-keeping system. 2.4 Classification of Accounts. 2.5 Golden Rules of Debit and Credit (Traditional Approach) 2.6 Modern Approach of Rules of Accounts. 2.7 Illustrations. 2.8 Accounting Equations. 2.9 Accounting Concepts – Entity concept- Dual Aspect concept – Accounting Period Concept – Going concern Concept – cost Concept – money Measurement Concept – Matching Concept – Realization – accrual Concept – Rupee Value Concept. 2.10 Terms used in accounting: Debtors, Creditors, Bill Receivable, Bills Payable, Credit Note, Debit Note, Petty Cash, Contra Entry, Trade Discount, Cash Discount, Suspense A/c.	8	CO1, CO2
3	Unit – III Journal 3.1 Meaning, Importance and Utility of Accounting Documents. 3.2 Meaning, Definition, Importance and Utility of Journal. 3.3 Specimen of Journal. 3.4 Recording of Journal entries with GST.	6	CO1, CO3

REFERENCE BOOKS:

1. Robert N. Anthony, David F. Hawkins, Kenneth A. Merchant. Accountancy- text and cases. McGraw Hill Education (India) Private Limited, New Delhi.
2. Fundamentals of Accounting by Dr. S.N. Maheshwari, Dr.S.K. Maheshwari- Vikas Publishing House(ISBN-139788180544491).
3. Financial accounting: By Jane Reimers (Pearson Education) ISBN: 9780136115274.
4. Book - Keeping and Accountancy Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune - 411 004

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	1	1	2	2	2	3	2	1	2
CO2	3	3	2	1	2	2	2	2	2	2	1	2
CO3	3	3	2	2	2	2	2	2	2	2	2	2

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create

Continuous Internal Evaluation. (20)	✓	✓	✓			✓
End Semester Examination (30)	✓	✓	✓	✓		✓

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Applications

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: I

IMCA-OE-114-A - Digital Marketing-I

Course Title: Digital Marketing – I

Course Code: IMCA-OE-114-A

Lectures: Tutorials: Practical: 2:0:0

Lecture Hours: 24 Hours

Course Type: OE

Total Credits: 02

CIE Marks: 20

ESE Marks: 30

Course Description:

This course introduces students to the fundamentals of digital marketing. It focuses on essential concepts and strategies, including search engine optimization (SEO), social media marketing, content marketing, and email marketing, to build a strong digital presence and engage with customers effectively.

Course Objectives:

The course aims to provide a thorough understanding of digital marketing's core principles, including its various components such as SEO, social media, content marketing, and email marketing. Students will learn how to design and manage effective digital marketing campaigns, using real-world examples to apply their knowledge. The course also covers key tools and techniques, such as analytics platforms and SEO tools, to enhance digital marketing efforts. Additionally, students will develop skills to analyze campaign performance using data-driven insights, enabling them to optimize strategies for improved engagement, conversion rates, and return on investment (ROI).

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	--	✓	--	✓	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

C01	Understand the core principles of digital marketing.
C02	TO Gain insights into various digital marketing tools and techniques.
C03	To Develop skills to analyze digital marketing performance and optimize strategies.

SN	Contents of Module	Hrs	COs
1	Unit – 1 Introduction to Digital Marketing 1.1 Overview of Digital Marketing 1.2 Key Differences between Digital and Traditional Marketing 1.3 The Digital Marketing Landscape 1.4 Importance of Digital Marketing in the Modern Business Environment 1.5 Digital Marketing Channels and Types 1.6 The Digital Consumer and Customer Journey 1.7 Digital Marketing Strategy and Planning	8	C01
2	Unit – 2 Search Engine Optimization (SEO) 2.1 Understanding Search Engines 2.2 SEO Strategies and Best Practices 2.3 On-Page SEO Techniques 2.4 Off-Page SEO Techniques 2.5 Tools for SEO Analysis and Monitoring	8	C02

SN	Contents of Module	Hrs	COs
	2.6 Common SEO Mistakes to Avoid 2.7 Future Trends in SEO		
3	Unit – 3 Social Media and Content Marketing 3.1 The Role of Social Media in Digital Marketing 3.2 Content Creation and Curation Strategies 3.3 Social Media Advertising and Analytics 3.4 Building and Engaging an Online Community 3.5 Influencer Marketing on Social Media 3.6 Social Media Listening and Reputation Management 3.7 Future Trends in Social Media and Content Marketing	8	CO3

REFERENCE BOOKS:

1. Vandana, Ahuja; Digital Marketing, Oxford University Press India (November, 2015).
2. Menon, Arpita; Media Planning and Buying; McGraw Hill (1st Edition, 2010)
3. Arnold, George; Media Writer's Handbook: A Guide to Common Writing and Editing Problems; McGraw-Hill Education; (5th edition, 2008)
4. Ryan, Damian; Understanding Digital Marketing: marketing strategies for engaging the digital generation; Kogan Page (3rd Edition, 2014).

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2	3	2	2	2	3	2	2	2
CO2	2	2	3	2	3	2	2	2	2	2	2	3
CO3	2	2	3	3	3	3	2	2	3	3	2	3

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Utilize	Develop
Continuous Internal Evaluation. (20)	✓	✓	✓		✓	✓
End Semester Examination (30)	✓	✓	✓	✓	✓	✓

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Applications

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: I

IMCA-OE-114-B Personal Financial Planning-I

Course Title: Personal Financial Planning-I

Course Code: IMCA-OE-114-B

Lectures: Tutorials: Practical: 2:0:0

Lecture Hours: 24 Hours

Course Type: OE

Total Credits: 02

CIE Marks: 20

ESE Marks: 30

Course Description:

This course will help students organize their financial lives by learning and implementing selected principles of accounting, finance, and management. The course will address value and risk determination by dealing specifically with the analysis of one's financial status, goal setting and planning, and decision-making. Risk analysis, savings and investment principles, taxes, debt management, retirement, and estate considerations are areas, which guide the financial management of individuals and businesses alike.

Course Objectives:

- To provide the student with an understanding of the personal financial planning and its relevance to modern management practices.
- It covers introduction, investment management and risk analysis.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	--	✓	--	✓	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Understand the fundamental concepts of Personal financial planning.
CO2	Analyze and apply knowledge and theories of financial planning.
CO3	Apply skills for effective decision-making in financial planning

SN	Contents of Module	Hrs	COs
1	Unit – 1 Introduction to Financial Planning 1.1 Introduction: Financial goals, steps in financial Planning, budgeting incomes and payments, Time Value of Money, Introduction to savings, benefits of savings, management of spending & financial discipline, setting alerts and maintaining sufficient funds for fixed commitments, Financial Security, Importance of Personal Financial Planning, Principles of Personal Finance, Biases in Personal Finance. 1.2 Financial Statements and Ratios Analysis: Managing Cash Flows, Creating and Reviewing Financial Statements, Analyzing Financial Statements, Budget.	8	CO1 & CO2
2	Unit – 2 Introduction to Insurance and Risk Management	8	CO1 & CO2

SN	Contents of Module	Hrs	COs
	<p>2.1 Risk Management: Risk and Return, Risk Management, Risk Diversification, Managing Life, Health and Disability Risks, Concept and Types of Insurance.</p> <p>2.2 Investment Fundamentals: Saving and Investment, Rules of Investing, Debt and Equity. Investment in Bonds and Mutual Funds. Managing Income Taxes: Introduction to Personal Income Tax Planning, Tax Avoidance and Tax Evasion.</p> <p>2.3 Building and Maintaining Good Credit: Credit Basics and Debt Management, Sources of Debt, Credit Report and Scores.</p>		
3	<p>Unit – 3 Investment Planning</p> <p>3.1 Basics of Investment: Process and objectives of investment, concept and measurement of return & risk for various asset classes, measurement of portfolio risk and return, diversification & portfolio formation. Gold bond; Real estate; Investment in green field and brownfield Projects; Investment in fixed income instruments, financial derivatives & commodity market in India. Mutual fund schemes; International investment avenues. Currency derivatives and digital currency.</p>	8	CO1, CO2 & CO3

REFERENCE BOOKS:

- Halan, M. *“Let's Talk Money: You've Worked Hard for It, Now Make It Work for You”* Harper Collins Publishers, New York.
- Indian Institute of Banking & Finance. *“Introduction to Financial Planning”* Taxmann Publication, New Delhi.
- Keown A.J. *“Personal Finance”* Pearson, New York.
- Madura, J. *“Personal Finance”*, Pearson
- Pandit , A. *“The Only Financial Planning Book that You Will Ever Need”* Network 18 Publications Ltd., Mumbai.
- Sinha, M. *“Financial Pfanning: A Ready Reckoner”* McGraw Hill Education, New York.
- Tripathi, V. *“Fundamentals of Investment”* Taxmann Publication, New Delhi.

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	2	1	1	1	2	1	1	1
CO2	2	2	1	1	2	1	2	1	2	2	1	1
CO3	2	2	1	2	3	1	2	2	3	2	2	2

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Utilize	Develop
Continuous Internal Evaluation. (20)	✓	✓	✓	✓		
End Semester Examination (30)	✓	✓	✓	✓	✓	✓

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FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: I

IMCA-VSC-115 Web Technology-I

Course Title: Web Technology-I

Course Type: VSC

Course Code: IMCA-VSC-115

Total Credits: 02

Lectures: Tutorials: Practical: 0:0:2

CIE Marks: 20

Lecture Hours: 24 Hours

ESE Marks: 30

Course Description:

This course focuses on the foundational aspects of web development, specifically HTML and CSS. Students will learn to create well-structured, styled web pages, gaining practical skills essential for web design. The course includes hands-on practice to reinforce theoretical knowledge.

Course Objectives:

- **Master HTML Fundamentals:** Understand HTML structure, create semantic documents, and implement forms and tables.
- **Develop Advanced CSS Skills:** Style HTML with CSS, use Flexbox and Grid for layouts, and apply transitions, animations, and transforms.
- **Implement Responsive Design Techniques:** Design responsive web pages with media queries and adaptive layouts.
- **Utilize LESS for Efficient Styling:** Use LESS features like variables, mixins, and nesting to simplify and organize CSS.
- **Apply Sass for Advanced Styling Solutions:** Leverage Sass variables, mixins, and functions for modular and maintainable styling.
- **Integrate LESS and Sass into Workflow:** Compare LESS and Sass, and integrate them into development workflows using build tools.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	✓	--	✓	--	✓	✓

Course Outcomes:

C01	Create and style responsive, semantic web pages using HTML, CSS, LESS, and Sass, employing advanced techniques for modern web design.
C02	Utilize LESS and Sass to write efficient, modular, and maintainable CSS, integrating them effectively into web development workflows.
C03	Debug, optimize, and apply best practices in web design and development to produce high-quality, performant, and accessible websites.

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	2	2	3	2	3	2	2	1	3	2	2	2

C02	2	3	3	3	3	2	2	2	2	2	2	2
C03	2	2	2	2	3	2	2	1	3	2	2	2

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create
Continuous Internal Evaluation. (20)	✓	✓	-	✓	✓	-
End Semester Examination (30)	✓	✓	-	✓	✓	-

Practical Assignments:

1	Basic HTML Page Creation: Create a simple HTML page with headings, paragraphs, and lists
2	Hyperlink Implementation: Add internal and external links to an HTML document.
3	Image Embedding: Insert and style images And Form within an HTML page.
4	Table Creation: Design a table to display structured data.
5	Style a Web Page with Basic CSS <ul style="list-style-type: none"> Apply CSS to style text, backgrounds, and margins of a simple HTML page.
6	Create a Box Layout <ul style="list-style-type: none"> Use CSS to create a layout with multiple boxes (e.g., a three-column layout) with different background colors and padding.
7	Design a Basic Button with Hover Effects <ul style="list-style-type: none"> Style a button with different states (normal, hover, active) using CSS.
8	Develop a Simple Footer Layout <ul style="list-style-type: none"> Create a footer with multiple columns and style it with CSS for a clean and organized appearance.
9	Use LESS Variables for Colors <ul style="list-style-type: none"> Define and apply variables in LESS for colors to standardize the color scheme across multiple elements.
10	Implement a LESS Mixins for Buttons <ul style="list-style-type: none"> Create a mixin in LESS for button styles and use it to apply consistent button styling.
11	Apply Nesting in LESS <ul style="list-style-type: none"> Use LESS nesting to write CSS for a simple navigation menu, demonstrating how nested rules are structured.
12	Build a Responsive Layout with LESS <ul style="list-style-type: none"> Develop a basic responsive layout using LESS, with media queries for different screen sizes
13	Create and Use Sass Variables <ul style="list-style-type: none"> Define variables in Sass for colors, fonts, and sizes, and apply them to style a simple HTML page.
14	Implement Sass Mixins for Reusable Styles <ul style="list-style-type: none"> Develop mixins in Sass for common styling patterns, such as border-radius or box-shadow.
15	Design a Simple Grid System with Sass <ul style="list-style-type: none"> Build a basic grid system using Sass, applying it to create a simple layout with columns.

16	Apply a Basic Sass Function for Color Manipulation <ul style="list-style-type: none">• Use a Sass function to adjust color brightness or contrast and apply it to different elements on a page.
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REFERENCE BOOKS:

1. **"HTML and CSS: Design and Build Websites"** by Jon Duckett
2. **"Responsive Web Design with HTML5 and CSS"** by Ben Frain
3. **"Mastering LESS"** by Pradeep Gohil
4. **"Sass for Web Designers"** by Dan Cederholm (Indian Edition)

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: I

IMCA-SEC-116-Computer Fundamentals

Course Title: Computer Fundamentals

Course Type: SEC

Course Code: IMCA-SEC-116

Total Credits: 02

Lectures: Tutorials: Practical: 2:0:0

CIE Marks: 20

Lecture Hours: 24 Hours

ESE Marks: 30

Course Description:

Fundamentals of Computer course provides a basics of computer system and data representations. It covers fundamental concepts, theories, and Solving example essential for understanding basic computer knowledge & number system. Students will be understanding the concepts different input, output devices and memory management techniques & Implementing Algorithms & flowchart to solving examples. Also understand different types of transmission media's in networking, Transmission Path and Internet applications as well as different topologies.

Course Objectives:

1. To Understand the basics of computer system, number system.
2. To Understand the concepts different input, output devices and memory concepts & design Algorithms & flowchart.
3. Introduction to the different transmission media's in networking, Transmission Path and Internet applications, LAN, MAN, WAN, Wireless Networks & Switching techniques as well as different topologies

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	--	--	✓	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Understand the basics of computer & Data representation
CO2	Describe concepts different input, output devices and memory & Analyse Algorithms & flowchart.
CO3	Describe concepts of basic Computer Network.

SN	Contents of Module	Hrs	COs
1	Unit - I Introduction to Computer System & Data representation 1.1 History & generation of computer 1.2 Definition of computer 1.3 Computer Language 1.4 Block diagram of computer system 1.5 Types of computers 1.6 Definition- Software, Hardware, Firmware, Translators, Compiler, Interpreter, Loader and Linder, Compiler 1.7 Introduction to Number system: decimal, binary, octal and hexadecimal, Conversion in Number System.	8	CO1
2	Unit - II Memory Management & Designing Algorithm with Flowchart 2.1 What is and Memory Management	8	CO2

SN	Contents of Module	Hrs	COs
	2.2 Types of Memory Primary- RAM, ROM, PROM, EPROM 2.3 Secondary- Magnetic Disk, Hard Disk and CD, Pen drive. 2.4 Algorithm, Program Development steps- Algorithms 2.5 Flowchart, Flowchart symbols ,Examples of Specification for converting Algorithms and flowchart into Programs basic (Minimum 5)		
3	Unit - III Fundamental of Networking and Internet Services 3.1 Computer Net 3.2 work: Definition of Computer Network 3.3 Types of Networks: LAN, MAN, WAN. 3.4 Topologies: Star, Tree, Bus, Ring, Mesh, Fully Connected. 3.5 Wired and Wireless Networks 3.6 Internet: History of Internet 3.7 Working of Internet 3.8 Use of Internet, Applications of Internet	8	CO3

REFERENCE BOOKS:

1. Fundamentals of computer - V. Raja Raman, (PHI Publication)/SBW10:812034011
2. Computer Networks - Andrew S. Tanenbaum , Fourth Edition. /SBWnumber0130661023
3. Computer and studies a first course - Roger Hunt and John Shelley, (PHI Publication)/SBW10:0131646737
4. Cloud Computing for Dummies -Hurwitz Judith S. and Daniel Kirsch.

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	2	1	2	1	2	1	1	1
CO2	3	3	2	2	3	1	2	2	2	1	1	2
CO3	3	2	2	1	3	1	2	2	2	1	2	2

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create
Continuous Internal Evaluation. (40)	✓	✓	-	✓	✓	-
End Semester Examination (60)	✓	✓	-	✓	✓	-

Practical Assignments:

1. To study of Introduction & Installation of Operating System (Linux and Windows).
2. Run different commands of MS DOS - CD, DIR, Date, Time, COPY, REN, CLS, MD, RD, etc.
3. Study different web Browsers- Internet Explorer, Fire fox, downloading of files
4. Study different Various Components of Computer.
5. Study of various computer Network Devices.
6. Create your E-Mail ID on any free E-Mail Server.
7. Login through your E-Mail ID and do the following:
 - a. Read your mail
 - b. Compose a new Mail
 - c. Send the Mail to one person
 - d. Send the same Mail to various persons

- e. Forward the Mail
 - f. Delete the Mail
 - g. Send file as attachment
8. Demonstrate the usage of various storage devices (data copying, CD/DVD burning)
 9. Create and demonstrate of text formatting, tables, shapes, smart-arts, charts.
 10. Create a spreadsheet which will demonstrate use of aggregate function.
 11. Create and demonstrate power point presentation with animation
 12. Prepare a presentation with five slides including animation and documentation report of it.

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Applications

M.C.A. (INTEGRATED) PROGRAMME BATCH 2024-29

SEMESTER: I

IMCA-AEC-117 Mathematics for Computer Application-I

Course Title: Mathematics for Computer Application-I

Course Type: AEC

Course Code: IMCA-AEC-117

Total Credits: 02

Lectures: Tutorials: Practical: 2:0:0

CIE Marks: 20

Lecture Hours: 24 Hours

ESE Marks: 30

Course Description:

This course focuses on Mathematics oriented toward Computer Science. Students will learn to analyse problems and solve them using concepts of mathematics. The course consists of fundamental concepts of Mathematics like Logic, Sets, Matrix, Functions, Relations.

Course Objectives:

1. Understand the concepts of mathematical logic to solve problems
2. Understand sets; apply operations on sets and algebraic structures.
3. Analyse the matrix and determinants.
4. Apply the mathematical concepts such as relations and functions.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	✓	--	✓	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Understand mathematical logic to solve problems and apply operations on sets and algebraic structures.
CO2	Analyse the matrix and determinants.
CO3	Apply the mathematical concepts such as relations and functions.

SN	Contents of Module	Hrs	COs
1	Unit – I Mathematical Logic and Set Theory 1.1 Logical Operations: Negation, Conjunction & Disjunction Implication, Double Implication, Equivalence, Equivalence of Logical Statements, Truth Tables & Construction of Truth Tables, Tautology and Contradiction, Argument: Valid and Invalid Arguments, Normal Forms using truth table. 1.2 Set: Meaning of a Set, Method of Describing a Set, Tabular Form, Set Builder Form, Types of A Set: Finite Set, Infinite Set, Equal Sets, Overlapping Sets, Disjoint Sets, Complementary Set. Operations on Sets: Union of Sets, Intersection of Sets, Difference of Sets, Demorgan's laws , Venn Diagrams, Cartesian product Of Two Sets, Groups, Semigroup.	10	CO1
2	Unit – II Matrices & Determinants 2.1 Basics of Matrices: Meaning of A Matrix, Order of Matrix, Types of Matrix: Zero Matrix, Column Matrix, Square Matrix, Diagonal Matrix, Scalar Matrix, Unit Matrix, Symmetric c Matrix, Skew-Symmetric	8	CO1, CO2

SN	Contents of Module	Hrs	COs
	Matrix, Transpose of A Matrix: Singular Matrix & Non-Singular Matrix, Algebra of Matrices. Determinants: Evaluation of Second and Third Order Determinants, Minor, Cofactor of an Element Adjoint of Matrix, Meaning of Inverse of a Matrix, Matrix Inversion by Adjoint Method.		
3	Unit – III Relation and Function 3.1 Relations: and Their Properties, n-ary Relations and Their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Congruence Relation. 3.2 Function: Meaning of a Function, Methods of Describing a Function, Meaning of Domain, Codomain, Image, and Range of a Function. Types Of A Function: One-One Function, One Two Functions, Many-One Function, Constant Function, Identity Function, Polynomial Function, Linear Function, Rational Function, Exponential Function, Logarithmic Function, Explicit And Implicit Functions, Even Function, Odd Function, Composite Function.	6	C03

REFERENCE BOOKS:

1. Sancheti&Kapoor, Business Mathematics ,Sultan Chand & Co. New Delhi.
2. Anand Sharma ,Business Mathematics & Analytics Himalaya Publishing
3. Dr.Ramnath Dixit and Dr.Jinendra Jain Business Mathematics Himalaya Publishing
4. G. S. S. BhismaRao, Mathematical Foundation of Computer Science, Scitech publication, India Pvt. LTD. Edition 2nd ISBN 0 – 07 – Y85493 –9
5. Tremblay, Discrete Mathematics, TATA Mcgraw Hill ISBN 13:9780074631133

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	3	2	2	1	2	1	2	1	2	1	1	1
C02	3	3	2	2	2	1	2	1	2	1	1	1
C03	3	2	2	2	2	1	2	2	2	1	1	2

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create
Continuous Internal Evaluation (20)	✓	✓	✓	✓	✓	-
End Semester Examination (30)	✓	✓	✓	✓	✓	-

Semester II

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: II

IMCA-DSC-121 Object Oriented Programming Concepts using C++

Course Title: Object Oriented Programming Concepts using C++

Course Type: DSC

Course Code: IMCA-DSC-121

Total Credits: 04

Lectures: Tutorials: Practical: 4:0:0

CIE Marks: 40

Lecture Hours: 48 Hours

ESE Marks: 60

Course Description:

This course introduces students to the Object-Oriented Paradigm using C++. It covers essential concepts of OOP, including encapsulation, inheritance, and polymorphism, and how these concepts can be implemented in C++. The course also emphasizes practical programming skills and problem-solving techniques.

Course Objectives:

- To understand the principles and benefits of the Object-Oriented Paradigm.
- To learn the syntax and structure of the C++ programming language.
- To explore the concepts of classes, objects, inheritance, and polymorphism.
- To develop the ability to solve problems using OOP techniques in C++.
- To enhance skills in writing, testing, and debugging C++ programs.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	--	--	✓	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

C01	Understanding the Object-Oriented Paradigm.
C02	Understanding in C++ Controls, Pointers, and Functions
C03	Demonstration Classes and Objects in C++
C04	Apply inheritance concepts to solve programming problems
C05	Explain and apply polymorphism in C++ to enhance code flexibility and functionality.
C06	Demonstrate the use of Templates & Exception Handling and file handling in C++.

SN	Contents of Module	Hrs	COs
1	Unit 1: Introduction and Basics of OOP 1.1 Introduction to Object-Oriented Paradigm 1.2 Need for Object-Oriented Programming 1.3 Characteristics of Object-Oriented Programming (Encapsulation, Abstraction, Inheritance, Polymorphism) 1.4 Difference between Structured Programming and OOP	6	CO1
2	Unit 2: C++ Controls, Pointers & Functions	8	CO2

SN	Contents of Module	Hrs	COs
	2.1 Input/Output in C++ (cin, cout, iostream) 2.2 Data Types and Operators (Arithmetic, Relational, Logical , Bitwise) 2.3 Control & Conditional Statements (if, else, switch, loops) 2.4 Pointer Variables (Declaration, Initialization, Dereferencing, Arrays), Pointer Arithmetic 2.5 Function and its Components, Parameter Passing Mechanisms (Pass by Value, Reference, Pointer) - Pointer as Function Argument - Recursive Functions		
3	Unit 3: Objects and Classes 3.1 Class Declaration in C++ (Data Members, Member Functions) 3.2 Constructors (Default, Parameterized, Copy) 3.3 Destructors 3.4 Difference between Classes and Structures 3.5 Friend Class and Friend Function	8	C03
4	Unit 4: Inheritance 4.1 Inheritance: Definition and Concept (Base and Derived Classes) 4.2 Types of Inheritance (Single, Multiple, Multilevel, Hierarchical, Hybrid) 4.3 Visibility Modes (Public, Private, Protected) 4.4 Virtual Base Class 4.5 Benefits of Inheritance (Reusability, Extensibility, Maintenance)	8	C04
5	Unit 5: Operator Overloading 5.1 Operator Overloading: Definition 5.2 Unary Operator Overloading 5.3 Binary Operator Overloading (+, -, *, ==) 5.4 Rules for Operator Overloading (Precedence, Associativity) 5.5 Operator Overloading using Friend Functions 5.6 Function Overloading	10	C05
6	Unit 6: Virtual Functions, Templates & Exception Handling & File Handling 6.1 Virtual Functions (Polymorphism, Overriding) 6.2 Pure Virtual Functions (Abstract Classes) 6.3 Function Templates (Generic Programming) 6.4 Exception Handling Constructs (try, catch, throw) 6.5 Introduction to File System (File Modes, File Streams) 6.6 Basic Read and Write File Functions	8	C06

REFERENCE BOOKS:

1. Object-Oriented Programming in C++ – E. Balagurusamy, Tata McGraw-Hill.
2. C++: The Complete Reference – Herbert Schildt, McGraw-Hill Education.
3. Programming in C++ – Ashok N. Kamthane, Pearson Education.
4. The C++ Programming Language – Bjarne Stroustrup, Addison-Wesley.

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	3	2	2	1	2	1	2	2	2	2	1	2
C02	3	3	2	2	3	1	2	2	2	2	2	2
C03	3	3	2	2	3	1	2	2	2	2	2	2
C04	3	3	3	2	3	1	2	2	2	2	2	2
C05	3	3	3	2	3	1	2	2	2	2	2	2
C06	3	3	3	2	3	3	2	2	2	2	2	2

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyse	Evaluate	Create
Continuous Internal Evaluation (40)	✓	✓	-	✓	✓	-
End Semester Examination (60)	✓	✓	-	✓	✓	-

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FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Applications
M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: II

IMCA-DSC-122 Lab on OOPS Concepts using C++

Course Title: Lab on OOPS Concepts using C++

Course Type: DSC

Course Code: IMCA-DSC-122

Total Credits: 02

Lectures: Tutorials: Practical: 0:0:2

CIE Marks: 20

Lecture Hours:

ESE Marks: 30

Course Description:

This course introduces students to the Object-Oriented Paradigm using C++. It covers essential concepts of OOP, including encapsulation, inheritance, and polymorphism, and how these concepts can be implemented in C++. The course also emphasizes practical programming skills and problem-solving techniques.

Course Objectives:

- To understand the principles and benefits of the Object-Oriented Paradigm.
- To learn the syntax and structure of the C++ programming language.
- To explore the concepts of classes, objects, inheritance, and polymorphism.
- To develop the ability to solve problems using OOP techniques in C++.
- To enhance skills in writing, testing, and debugging C++ programs.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	--	--	✓	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

C01	Understand the basic programming skills including variables, control structures, functions, and arithmetic operations etc
C02	Understand and apply OOP principles like encapsulation, inheritance, and polymorphism, including implementing classes with constructors/destructors, function overloading, and operator overloading.
C03	Learn advanced techniques including dynamic memory management, exception handling, and file operations, enabling effective memory management and error handling.
C04	Understand basic data structures such as arrays and strings.
C05	Understand Pointer and Memory Management

Sr. No.	Practical List
1	Write a program to check whether a number is even or odd using if-else.
2	Write a program to calculate the sum and average of three numbers using control structure.
3	Write a program to determine whether a number is prime or composite.
4	Write a program to calculate the sum, difference, product, and quotient of two integers.

5	Write a program to demonstrate use of function overloading. (e.g., area of a circle, rectangle, and triangle).
6	Write a program to demonstrate encapsulation using of class.
7	Write a program to demonstrate the use of different types of constructors and a destructor in a class.
8	Write a program to demonstrate single inheritance.
9	Write a program to demonstrate multiple inheritance.
10	Write a program to demonstrate use of unary operator overloading.
11	Write a program to demonstrate use of binary operator overloading.
12	Write a program to demonstrate use of friend function.
13	Write a program to demonstrate use of virtual function.
14	a) Write a program to demonstrate the use of a pointer to pointer. b) Write a program to create pointers that point to objects and access their members. c) Write a program to demonstrate the use of pointers to functions.
15	Write a program to demonstrate use of Exception Handling.
16	a) Write a program to find the largest and smallest elements from an array. b) Write a program to sort an array in ascending and descending order.
17	Write a program to concatenate two strings and find the length of a string.
18	Write a program to calculate the factorial of a number using recursion
19	Write a program that demonstrates different types of polymorphism (e.g., method overriding).
20	Write a program to demonstrate use of File Handling.
21	Write a program to allocate and deallocate memory dynamically using pointers.

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	3	3	2	1	3	1	2	2	2	2	1	2
C02	3	3	3	2	3	2	2	2	2	2	2	2
C03	3	3	3	2	3	2	2	2	2	2	2	2
C04	3	2	2	1	2	1	2	2	2	2	1	2
C05	3	3	3	2	3	2	2	2	2	2	2	2

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create
Continuous Internal Evaluation. (40)	✓	✓	✓		✓	✓
End Semester Examination (60)	✓	✓	✓	✓	✓	✓

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FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: II

IMCA-MIN-123 System Analysis and Design

Course Title: System Analysis and Design

Course Code: IMCA-MIN-123

Lectures: Tutorials: Practical: 2:0:0

Lecture Hours: 24 Hours

Course Type: Minor

Total Credits: 02

CIE Marks: 20

ESE Marks: 30

Course Description:

The objective of the course is to provide the necessary background and experience in developing a System so that a student can enter in the professional community in the capacity of a system analyst or programmer. This course provides the student with a practical approach to systems analysis and design using a blend of traditional developments and current technologies. The student will learn how to apply established and evolving methodologies for the analysis, design, and development of an information system.

Course Objectives:

- To understand the fundamental concepts of systems, their analysis, and design.
- To apply systematic approaches to problem-solving in the context of system development.
- To equip students with the skills necessary to model, analyze, and design complex systems.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	✓	--	--	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

C01	Understand systems and their development through the System Development Life Cycle (SDLC).
C02	Develop various system models, including DFDs, ERDs, and Use Case Diagrams.
C03	Design efficient systems with robust testing and maintenance.

SN	Contents of Module	Hrs	COs
1	Unit – 1 Overview of System Analysis and Design 1.1 Introduction to Systems Concepts: Definition and characteristics of a system, Types of systems (open, closed, physical, abstract), Subsystems and system boundaries 1.2 System Development Life Cycle (SDLC): Phases of SDLC: Planning, Analysis, Design, Implementation, and Maintenance, Advantages and limitations of SDLC, Role of system analysts and stakeholders 1.3 Problem Identification and Feasibility Analysis: Identifying system requirements, Types of feasibility studies: Technical, Economic, Legal, Operational, and Schedule feasibility, Feasibility report and its components	8	C01
2	Unit – 2 System Modelling and Design Techniques 2.1 Data Flow Diagrams (DFD): Levels of DFD: Context, Level 0,	8	C02

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FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: II

IMCA-OE-124-A- Marketing Management

Course Title: Marketing Management

Course Type: OE

Course Code: IMCA-OE-124-A

Total Credits: 02

Lectures: Tutorials: Practical: 2:0:0

CIE Marks: 20

Lecture Hours: 24 Hours

ESE Marks: 30

Course Description:

The "Fundamentals of Marketing" course provides an overview of key marketing concepts and practices. It covers the definition, nature, scope, and importance of marketing, contrasting it with selling and exploring functional areas and the marketing process. The course examines the role of a marketing manager in the modern business environment and delves into the marketing environment, including micro and macro factors, as well as segmentation, targeting, and positioning strategies. Additionally, it explores the marketing mix, focusing on product development, pricing, distribution channels, and promotional strategies.

Course Objectives:

The subject aims to provide the student with:

- To know and understand the concepts, principles, process and environment of marketing.
- To understand the need and importance of market segmentation, targeting and positioning.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	--	✓	✓	✓	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

C01	Define the fundamental concepts of marketing, including its definition, nature, scope, process and importance (Remember) .
C02	Explain the concept of the marketing environment, segmentation, targeting and positioning (Understand) .
C03	Explain the concept of the marketing mix and its components, commonly referred to as the 4Ps (Product, Price, Place, and Promotion). (Understand) .

SN	Contents of Module	Hrs	COs
1	Unit 1: Introduction: 1.1 Definition, Nature, scope and importance of marketing. 1.2 Selling Vs Marketing 1.3 Functional areas of Marketing 1.4 Marketing Process 1.5 Role of a Marketing Manager in the current scenario.	8	C01
2	Unit 2: Marketing Environment and Segmentation, Targeting and Positioning: 2.1 Concept of marketing environment and importance of marketing environmental analysis. 2.2 Micro-environment and Macro-environment 2.3 Meaning, concepts, benefits and limitations of segmentation	8	C02

SN	Contents of Module	Hrs	COs
	2.4 Bases for Segmenting Consumer Markets 2.5 Concept of Product Positioning and Differentiation		
3	Unit 3: Marketing Mix 3.1 Concept of Marketing mix. 3.2 Product – Concept, Levels of product (core benefit, basic product, expected product, augmented product and potential product), Product Life Cycle. 3.3 Price – Concept, significance, factors affecting price. 3.4 Place (Channel of distribution) – Meaning, importance, Types of distribution channels; Factors affecting choice of distribution channel. 3.5 Promotion – Nature, importance, Elements of Promotional Mix (Advertising, Publicity, Public Relations, Sales Promotion, Personal Selling and Direct Marketing).	8	CO3

REFERENCE BOOKS:

1. Marketing Management- S.A. Sherlekar, Himalaya Publishing House.
2. Principles of Marketing (A South Indian Perspective)- Philip Kotler, Gary Amrstrong, Prafulla Agnihotri, Ehsan, Pearson.
3. Marketing Management – RajanSaxena – Tata McGraw Hill.
4. Basics of Marketing Management – R.B. Rudani - S. Chand & Company Ltd.
5. Marketing Management – Ramaswamy, Namakumari 4th edition – Macmillion.
6. Principles of Marketing, R.K. Mittal, A. Sharma, V.K. Global Pub. Pvt. Ltd, New Delhi.
7. Principles of Marketing M K Nabi, K C Raut, Vrinda Publications (P) Ltd

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	1	1	1	1	1	1	2	1	1
CO2	1	2	2	1	1	2	1	2	2	2	2	2
CO3	1	2	3	2	1	2	1	2	2	2	2	2

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create
Continuous Internal Evaluation. (20)	✓	✓	✓			
End Semester Examination (30)	✓	✓	✓	✓		

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FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: II

IMCA-OE-124-B-Principles of Accounting-II

Course Title: Principles of Accounting-II

Course Type: OE

Course Code: IMCA-OE-124-B

Total Credits: 02

Lectures: Tutorials: Practical: 2:0:0

CIE Marks: 20

Lecture Hours: 24 Hours

ESE Marks: 30

Course Description:

An accountant takes you through the fundamentals of accounting and explains concepts like revenue, costs, assets, liabilities and equity through a series of ground breaking business simulations. Accounting principles serve several purposes. They ensure that all publicly-traded companies are reporting their transactions and data in the same way so the information can be compared accurately between companies. Accounting equips you with knowledge and skills that are important to every organization. From traditional roles such as auditors and tax professionals, to specialized positioning in accounting, financial analysis, and consulting, an accounting degree will unlock a rewarding career path for you.

Course Objectives:

- Introduce accounting in ledger and balance sheet.
- Identify the basics of financial accounting through the accounting cycle for service and merchandise business.
- Apply the theoretical foundation of financial accounting (concepts, assumptions, and principles) and the financial statements of a profit seeking enterprise.
- Perform the different steps of the accounting cycle for service and merchandising businesses.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	--	✓	--	--	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

C01	Understand to post recording from Books of original entries to Ledger. Balancing of various ledger accounts, prepare Trial Balance, meaning and need of Subsidiary Books, prepare and balance different types of Cash Book.
C02	Understand effects of Rectification of Errors, detect the errors and rectify them, meaning and need of Suspense A/c.
C03	Understand Meaning, Objective and Importance of Final Accounts, effects of adjustments and Prepare Trading A/c, Profit and Loss A/c and Balance sheet with competency.

SN	Contents of Module	Hrs.	COs
1	Unit – I Ledger & Subsidiary Books. 1.1 Meaning, Definition and Importance of Ledger. 1.2 Specimen of Ledger. 1.3 Posting of entries from Journal/Subsidiary Books to Ledger.	10	C01

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create
Continuous Internal Evaluation. (20)	✓	✓	✓			✓
End Semester Examination (30)	✓	✓	✓	✓		✓

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Applications

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: II

IMCA-OE-125-A Digital Marketing-II

Course Title: Digital Marketing - II

Course Code: IMCA-OE-125-A

Lectures: Tutorials: Practical: 2:0:0

Lecture Hours: 24 Hours

Course Type: OE

Total Credits: 02

CIE Marks: 20

ESE Marks: 30

Course Description:

This course introduces students to the fundamentals of digital marketing. It focuses on essential concepts and strategies, including search engine optimization (SEO), social media marketing, content marketing, and email marketing, to build a strong digital presence and engage with customers effectively.

Course Objectives:

The course aims to provide a thorough understanding of digital marketing's core principles, including its various components such as SEO, social media, content marketing, and email marketing. Students will learn how to design and manage effective digital marketing campaigns, using real-world examples to apply their knowledge. The course also covers key tools and techniques, such as analytics platforms and SEO tools, to enhance digital marketing efforts. Additionally, students will develop skills to analyze campaign performance using data-driven insights, enabling them to optimize strategies for improved engagement, conversion rates, and return on investment (ROI).

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	--	✓	--	✓	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Understand the strategic role of content in digital marketing and how it influences customer engagement and brand visibility.
CO2	Understand and apply mobile marketing strategies to reach and engage mobile users effectively.
CO3	Develop proficiency in using digital marketing analytics to track and measure campaign performance.

SN	Contents of Module	Hrs	COs
1	Unit – 1 : Content Marketing and Email Marketing 1.1 The Role of Content in Digital Marketing 1.2 Types of Content (Blogs, Videos, Infographics, etc.) Content Creation Process 1.3 Content Marketing Channels SEO for Content Marketing 1.4 Repurposing and Syndicating Content 1.5 Building and Segmenting an Email List 1.6 Crafting Effective Email Campaigns Email Marketing Automation 1.7 Tools for Email Campaigns (e.g., Mailchimp, Constant Contact) 1.8 A/B Testing in Email Marketing Measuring Email Marketing Success	8	CO1
2	Unit 2: Mobile Marketing and E-commerce	8	CO2

SN	Contents of Module	Hrs	COs
	1.1 Mobile Marketing Strategies 1.2 Mobile Advertising Formats 1.3 Mobile SEO and User Experience 1.4 Introduction to E-commerce marketing 1.5 Role of Digital Marketing in E-commerce 1.6 Conversion Rate Optimization (CRO) 1.7 E-commerce Tools and Platforms		
3	Unit 3: Analytics, Trends, and Future of Digital Marketing 1.1 Digital Marketing Analytics 1.2 Importance of Data in Digital Marketing 1.3 Overview of Google Analytics 1.4 Tracking and Measuring Digital Campaigns 1.5 Advanced Data Analysis Techniques 1.6 Emerging Trends in Digital Marketing 1.7 Capstone Project and Presentations <ul style="list-style-type: none"> • Students Work in Groups to Develop a Comprehensive Digital Marketing Plan • Presentation of the Plan to the Class • Feedback and Evaluation 	8	CO3

REFERENCE BOOKS:

1. Vandana, Ahuja; Digital Marketing, Oxford University Press India (November, 2015).
2. Menon, Arpita; Media Planning and Buying; McGraw Hill (1st Edition, 2010)
3. Arnold, George; Media Writer's Handbook: A Guide to Common Writing and Editing Problems; McGraw-Hill Education; (5th edition, 2008)
4. Ryan, Damian; Understanding Digital Marketing: marketing strategies for engaging the digital generation; Kogan Page (3rd Edition, 2014).

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2	3	2	1	1	2	2	1	2
CO2	2	2	3	2	3	2	1	1	2	2	1	2
CO3	2	2	3	3	3	3	2	2	3	3	2	3

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Utilize	Develop
Continuous Internal Evaluation. (20)	✓	✓	✓		✓	
End Semester Examination (30)	✓	✓	✓	✓	✓	

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Applications

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: II

IMCA-OE-125-B Personal Financial Planning-II

Course Title: Personal Financial Planning-II

Course Code: IMCA-OE-125-B

Lectures: Tutorials: Practical: 2:0:0

Lecture Hours: 24 Hours

Course Type: OE

Total Credits: 02

CIE Marks: 20

ESE Marks: 30

Course Description:

This course will help students organize their financial lives by learning and implementing selected principles of accounting, finance, and management. The course will address value and risk determination by dealing specifically with the analysis of one's financial status, goal setting and planning, and decision-making. Risk analysis, savings and investment principles, taxes, debt management, retirement, and estate considerations are areas, which guide the financial management of individuals and businesses alike.

Course Objectives:

The subject aims to provide the student with an understanding of the personal financial planning and its relevance to modern management practices. It covers introduction, investment management and risk analysis.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	--	✓	--	✓	--	✓	--

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Understand the fundamental concepts of Personal financial planning.
CO2	Analyse and apply knowledge and theories of financial planning.
CO3	Apply skills for effective decision-making in financial planning

SN	Contents of Module	Hrs	COs
1	Unit - 1 Personal Tax Planning 1.1 Basics of Tax: Tax structure in India for personal taxation, Scope of personal tax planning, exemptions and deductions available to individuals under different heads of income and gross total income. Comparison of benefits - Special provision u/s 115 BAC vis-à-vis General provisions of the Income-tax Act, 1961, tax avoidance versus tax evasion.	8	CO1 & CO2
2	Unit - 2 Insurance Planning 2.1 Introduction of Insurance: Need for insurance. Life insurance, health insurance, property insurance, credit life insurance and professional liability insurance.	8	CO1 & CO2
3	Unit - 3 Retirement Benefits Planning	8	CO1, CO2 & CO3

KCES's Institute of Management and Research (Autonomous), Jalgaon

FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: II

IMCA-VSC-126 Web Technology-II

Course Title: Web Technology-II

Course Type: VSC

Course Code: IMCA-VSC-126

Total Credits: 2

Lectures: Tutorials: Practical: 1:0:1

CIE Marks: 20

Lecture Hours: 24 Hours

ESE Marks: 30

Course Overview:

This course focuses on client-side scripting with JavaScript and front-end web development using the Bootstrap framework. The course emphasizes practical skills, enabling students to create dynamic, responsive web pages.

Course Objectives:

- **Understand and apply fundamental JavaScript concepts** to create interactive and dynamic web applications.
- **Develop server-side applications** using Node.js and Express.js to handle HTTP requests, manage data, and implement RESTful APIs.
- **Utilize Bootstrap for responsive web design** to build visually appealing and mobile-friendly websites with ease.
- **Integrate JavaScript, Node.js, Bootstrap, and Express.js** to build full-stack web applications, ensuring seamless interaction between front-end and back-end components.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	✓	--	✓	--	✓	--

Course Outcomes:

C01	Develop interactive and dynamic web applications using JavaScript for front-end functionality
C02	Create and manage server-side applications with Node.js and Express.js for robust backend solutions.
C03	Design responsive and visually appealing web pages using Bootstrap, ensuring cross-device compatibility.

Mapping of Course Outcomes to Program Outcomes:

CO/PO	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
C01	2	3	2	2	3	2	2	1	3	1	2	2
C02	2	3	3	3	3	2	2	2	2	2	2	2
C03	2	2	3	2	3	1	2	1	3	1	2	2

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Evaluate	Create
Continuous Internal Evaluation. (20)	✓	✓	-	✓	✓	-
End Semester Examination	✓	✓	-	✓	✓	-

(30)						
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Practical Assignments:

1	Basic JavaScript Program: Write a simple JavaScript program to perform arithmetic operations.
2	Control Structures: Implement a JavaScript program using if-else statements and loops
3	JavaScript Functions: Create and invoke functions that perform specific tasks.
4	Event Handling: Develop a web page where JavaScript responds to user events (e.g., button clicks).
5	Perform a practical on node js installation .
6	Set Up a Basic Node.js Server <ul style="list-style-type: none"> • Create a basic HTTP server using Node.js that responds with "Hello, World!" to any request.
7	Create a REST API with Node.js <ul style="list-style-type: none"> • Develop a basic REST API using Node.js that performs CR (Create, Read) operations on a simple data set.
8	Create a REST API with Node.js <ul style="list-style-type: none"> • Develop a basic REST API using Node.js that performs UD (Update, Delete) operations on a simple data set.
9	Perform a practical on bootstrap setup
10	Bootstrap Grid Layout: Create a responsive web page layout using Bootstrap's grid system.
11	Bootstrap Components: Implement a navigation bar and modal using Bootstrap components.
12	Create a Bootstrap Form <ul style="list-style-type: none"> • Design a form using Bootstrap's form components with input and styling.
13	Set Up a Basic Express.js Server <ul style="list-style-type: none"> • Create a basic Express.js server that serves static files and handles basic routing.
14	Build a Simple Blog with Express.js <ul style="list-style-type: none"> • Develop a simple blogging application using Express.js with routes for viewing, adding
15	Build a Simple Blog with Express.js <ul style="list-style-type: none"> • Develop a simple blogging application using Express.js with routes for updating
16	Build a Simple Blog with Express.js <ul style="list-style-type: none"> • Develop a simple blogging application using Express.js with routes for deleting posts.

REFERENCE BOOKS:

1. "JavaScript: The Good Parts" by Douglas Crockford
2. "Bootstrap 5: From Zero to Hero" by Dorianer Orozco
3. "Learning Node.js Development" by Andrew Mead

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FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Application

M.C.A. (Integrated) PROGRAMME BATCH 2024-29

SEMESTER: II

IMCA-SEC-127 Operating System Concepts with Linux Lab

Course Title: Operating System Concepts with Linux Lab

Course Code: IMCA-SEC-127

Lectures: Tutorials: Practical: 2:0:0

Lecture Hours: 24 Hours

Course Type: SEC

Total Credits: 02

CIE Marks: 20

ESE Marks: 30

Course Description:

This course will introduce our students to recall the basic concepts of operating system and its functions. It will focus on Linux operating systems. Throughout this course, students will also learn about alternative operating systems, like Windows, Linux etc. The course will begin with basic concepts of an operating systems, its components, architecture diagram etc. Over the course of the subsequent units, we will discuss the history of Linux, features, benefits of Linux etc. with students in detail. They will also learn each of the major components of an operating system and explore basic commands of Linux. The class will conclude with a discussion of various Shell Programs and Linux programs.

Course Objectives:

The subject aims to provide the student with an understanding of operating System basic concepts and its architecture, components etc. It also covers Linux operating System, its benefits. Students also learn the Linux commands to implement shell programming applications so that they can develop their own applications in Linux.

Teaching/ Evaluation Pedagogy

Chalk & Talk	ICT Tools	Group Discussion	Case Study	Guest Session	Survey	Assignment	Lab
✓	✓	✓	--	✓	--	✓	✓

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	To recall the basic concepts of Operating System like it's definition, types etc.
CO2	To Understand Components of OS and its architecture, Process state and learn basic Linux commands.
CO3	To Apply the Linux commands to implement the Shell Programming applications.

SN	Contents of Module	Hrs	COs
1	Unit-1: Introduction 1.1 Introduction of an Operating System 1.2 Components of an OS 1.3 Types of Operating System: Batch OS, Time-Sharing OS, Distributed OS, Network OS, Real-Time OS. 1.4 Architecture of Linux system 1.5 Process and States of Process	6	CO1 CO2
2	2. Linux Operating System 2.2 Brief History of Linux 2.3 features of Linux OS 2.4 Benefits of Linux 2.5 Basic commands of Linux: pwd, cd, ls, more, less, echo, clear, kill, ps, man, cal, date, who, who am I, wc, mkdir, rmdir, rm, sort.	6	CO2 CO3

REFERENCE BOOKS:

1. Peterson Silberschats, Galvin (2005), Operating System Concepts, Addition Wesley Publication. ISBN-10: 8126554274 ISBN-13: 978-8126554270
2. Peterson, (2007), Linux: Complete Reference, 6th Edition, TMH, ISBN: 9780070222946
3. Foster Johnson Welch, Anderson,(2006),Beginning Shell Scripting, Wiley India (Wrox), ISBN:9780764597916

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	1	1	1	1	1	1	1	1
CO2	3	3	1	1	2	1	1	1	1	1	1	1
CO3	2	2	1	1	3	1	1	1	1	1	1	1

Assessment Pattern

Bloom's Category	Remember	Understand	Apply	Analyze	Utilize	Develop
Continuous Internal Evaluation. (20)	✓	✓	✓			
End Semester Examination (30)	✓	✓	✓			

	Practical Assignments:
1	Demonstration of Linux commands with attributes: - pwd, cd, ls, more, less, echo, clear, kill, ps, man, cal, date, who, who am I, wc, mkdir, rmdir, rm, sort.
2	Write a shell script to display student information
3	Write a shell script to display addition of three number from runtime user input
4	Write a shell script to display first 20 terms of Fibonacci series.
5	Write a shell script to display current time of system and display the message according to the time.
6	Write a shell script to check the user is login or not and say hello.
7	Write a shell script to calculate factorial of a number.
8	Write a shell script to check number is divisible by 7 or not.
9	Write a shell script to check number is prime or not.
10	Write a shell script to check number is palindrome or not.
11	Write a shell script to check number is Armstrong or not.
12	Write a shell script to check number is even or odd.

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FACULTY OF SCIENCE AND TECHNOLOGY, School of Computer Applications
M.C.A. (INTEGRATED) PROGRAMME BATCH 2024-29

SEMESTER: II

IMCA-AEC-128 Mathematics for Computer Application-II

Course Title: Mathematics for Computer Application-II

Course Type: AEC

Course Code: IMCA-AEC-128

Total Credits: 02

Lectures: Tutorials: Practical: 2:0:0

CIE Marks: 20

Lecture Hours: 24 Hours

ESE Marks: 30

Course Description:

This course provides a comprehensive introduction to the mathematical and statistical principles that underpin computer science. It is designed to equip students with the necessary tools to understand, analyse computational methods and algorithms.

Course Objectives:

1. To build the foundation of computer algorithms using mathematical base.
2. To apply statistical measures on the data and represent it graphically.
3. To relate practical examples to the probability theory to build the foundation for machine learning.

Teaching/ Evaluation Pedagogy

Class Room Board	ICT Tools	Practical Demo	Presentation	Guest Session	Assignment
✓	✓			✓	✓

Course Outcomes: At the end of the Course, the Student will be able to:

C01	Solve applications involving permutations and combinations.
C02	Analyse statistical data using measures of central tendency, dispersion and location.
C03	Apply and Develop problem-solving techniques needed to accurately calculate probabilities.

SN	Course Contents	Hrs	COs
1	Unit-1: Statistics 1.1 Population 1.2 Sample 1.3 Parameters and statistics: definition, methods of sampling, types of variables, applications 1.4 Data Presentation: Classification of data, Frequency distribution, Cumulative and Relative frequency distribution, 1.5 Descriptive Statistics: Central tendency-mean, median, mode, range, quartile deviation, variance, standard deviation,	8	C01

<i>SN</i>	<i>Course Contents</i>	<i>Hrs</i>	<i>COs</i>
	1.6 Graphical representation of statistical data		
2	Unit-2: Permutation and Combination 2.1 Meaning of permutation and combination 2.2 Statement of fundamental 2.3 Principle of counting 2.4 Determination of number of permutations (all N Objects are different) 2.5 Determination of Number of Combination (all N objects are different).	8	CO2
3	Unit 3 Probability: 3.1 Making decisions under uncertainty 3.2 Classical definition of Probability 3.3 Events and their Outcomes 3.4 Rules of Probability 3.5 Probability axioms 3.6 Joint and Conditional probability 3.7 Probability independence 3.8 Bayes theorem,	8	CO3

REFERENCE BOOKS:

1. Michael Baron (2014) Probability and Statistics for Computer Scientists Second Edition, CRC press. ISBN: 978-1-4822-1410-9
2. Goon A.M., Gupta M.K., Dasgupta. B. (2001), Fundamentals of Statistics, Volume I and II, World Press, Calcutta.
3. Ross, S. (2005). Introduction to Probability Models, (6th Ed. Academic Press). ISBN 978 25 0-12-375686-2
4. Anand Sharma, (2008), Business Mathematics & Analytics, Himalaya Publishing house, ISBN NO.:1234029928

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	1	1	1	1	1	1	1	1
CO2	3	2	2	2	1	2	1	1	1	1	1	1
CO3	3	2	2	2	1	1	1	1	1	1	1	1

Assessment Pattern:

Bloom's Category	Remember (✓)	Understand (✓)	Apply (✓)	Analyse (✓)	Evaluate (✓)	Create (✓)
Continuous Internal Evaluation. (40)	✓	✓	✓	✓	✓	
End Semester Examination (60)	✓	✓	✓	✓	✓	

Question Paper Pattern (4 Credit Course)

Subject Code

Subject Name

Marks: 60

Times: 2 hrs

No. of Pages:

Instructions to Candidate

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should not, no supplement will be provided.

Q. No.	Question	CO	Marks
Que.1	Attempt any two		
	a.		6
	b.		6
	c.		6
Que.2	Attempt any two		
	a.		6
	b.		6
	c.		6
Que.3	Attempt any two		
	a.		6
	b.		6
	c.		6
Que.4	Attempt any two		
	a.		6
	b.		6
	c.		6
Que.5	Attempt any two		
	a.		6
	b.		6
	c.		6

Question Paper Pattern (2 Credit Course)

Subject Code

Subject Name

Marks: 30

Times: 1.5 hrs

No. of Pages:

Instructions to Candidate

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should not, no supplement will be provided.

Q. No.	Question	CO	Marks
Que.1	Attempt any two		
	a.		5
	b.		5
	c.		5
Que.2	Attempt any two		
	a.		5
	b.		5
	c.		5
Que.3	Attempt any two		
	a.		5
	b.		5
	c.		5