

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

COIMBATORE – 641 029

Programme Name: **Bachelor of Computer Applications**

Curriculum and Scheme of Examination under CBCS

(Applicable to the students admitted during the Academic Year 2026 - 2027)

Semester	Part	Subject Code	Title of the Paper	Instruction hours/cycle	Exam. Marks			Duration of Exam (hours)	Credits
					CIA	ESE	TOTAL		
I	I	26TML101	Language I@	6	25	75	100	3	3
	II	26ENG101	English -I	6	25	75	100	3	3
	III	26UCA101	Core Paper 1 - Python Programming	5	25	75	100	3	4
	III	26UCA1CL	Core Practical 1 - Python Programming Lab	5	40	60	100	3	4
	III	26UCA1A1	Allied Paper 1 - Computer Oriented Numerical and Statistics Methods	6	25	75	100	3	5
	IV	26EVS101	Environmental Studies **	2	-	50	50	3	2
	Total			30	-	30	550	-	21
II	I	26TML202	Language II@	6	25	75	100	3	3
	II	26ENG202	English –II	6	25	75	100	3	3
	III	26UCA202	Core Paper 2 - Object Oriented Programming with Java	5	25	75	100	3	4
	III	26UCA2CM	Core Practical 2 - Object Oriented Programming with Java Lab	5	40	60	100	3	4
	III	26UCA2A2	Allied Paper 2 - Operations Research	6	25	75	100	3	5
	IV	26VED201	Value Education- Moral and Ethics**	2	-	50	50	3	2
	Total			30	-	-	550	-	21
III	I	26TML303	Language III@	6	25	75	100	3	3
	II	26ENG303	English –III	6	25	75	100	3	3
	III	26UCA303	Core Paper 3 – RDBMS	4	25	75	100	3	3
	III	26UCA3CN	Core Practical 3 - RDBMS Lab	4	40	60	100	3	4
	III	26UCA3A3	Allied Paper 3 – Digital Marketing	6	25	75	100	3	5
	IV	26UGC3S1	Skill Based subject 1- Basics of Cyber Security	2	100	-	100	3	3
	IV	26TBT301/ 26TAT301/ 26UHR3N1	Basic Tamil* / Advanced Tamil**/ Non-Major Elective- I**	2	-	75	75	3	2
	Total			30	-	-	675	-	23
IV	I	26TML404	Language IV@	6	25	75	100	3	3
	II	26ENG404	English –IV	6	25	75	100	3	3
	III	26UCA404	Core Paper 4 – Full Stack Development	4	25	75	100	3	3
	III	26UCA4CO	Core Practical 4 - Full Stack Development Lab	4	40	60	100	3	4
	III	26UCA4A4	Allied Paper 4 - Data Structures	6	25	75	100	3	5
	IV	26UCA4SL	Skill Based subject 2-Linux Programming Lab	2	40	60	100	3	3
	IV	26TBT402/ 26TAT402/ 26UWR4N2	Basic Tamil* / Advanced Tamil**/ Non-Major Elective- II**	2	-	75	75	3	2
	Total			30	-	-	675	-	23
V	III	26UCA505	Core Paper 5 – Software Engineering	6	25	75	100	3	4
	III	26UCA506	Core Paper 6 - Operating Systems	5	25	75	100	3	4
	III	26UCA507	Core Paper 7 – Artificial Intelligence and Machine Learning	5	20	55	75	3	3
	III	26UCA5CP	Core Practical 5 – Artificial Intelligence and Machine Learning Lab	6	40	60	100	3	3
	III	26UCA5E1	Major Elective 1	5	25	75	100	3	5

	III	26UCA5OP	Natural Language Processing ##	1	25	-	25	2	1
	IV	-	EDC	2	100	-	100	3	3
	-	26UCA5IT	Internship Training ****	Grade					
	Total			30	-	-	600	-	23
VI	III	26UCA608	Core Paper 8 - Data Science with R Programming and Data Analytics	5	25	75	100	3	4
	III	26UCA6CQ	Core Practical 6 – Data Science with R Programming and Data Analytics Lab	5	40	60	100	3	4
	III	26UCA6CR	Core Practical 7- DevOps Lab	4	40	60	100	3	3
	III	26UCA609	Core Paper 9 - Computer Networks	5	25	75	100	3	4
	III	26UCA6E2	Major Elective 2	5	25	75	100	3	5
	III	26UCA6Z1	Project and Viva Voce***	4	20	80	100	-	5
	IV	26UBI6S3	Skill Based subject 3- Basics of Intellectual Property Right's	2	100	-	100	3	3
	Total			30	-	-	700	-	28
	V	26NCC \$/NSS/YRC /PYE/ECC/ RRC/WEC101#	Cocurricular Activities*	-	50	-	50	-	1
Grand Total				-	-	-	3800	-	140

Note:

CBCS – Choice Based Credit system, CIA– Continuous Internal Assessment, ESE– End of Semester Examinations

\$ For those students who opt NCC under Cocurricular activities will be studying the prescribed syllabi of the UGC which will include Theory, Practical & Camp components. Such students who qualify the prescribed requirements will earn an additional 24 credits.

@ Hindi/Malayalam/ French/ Sanskrit – 26HIN/MLM/FRN/SAN101 - 404

* - No End-of-Semester Examinations. Only Continuous Internal Assessment (CIA)

** - No Continuous Internal Assessment (CIA). Only End-of-Semester Examinations (ESE)

*** Project Report – 60 marks; Viva voce – 20 marks; Internal-20 marks

&& 4 hours allotted for project will not be allocated to staff work load.

One Credit Self-Study Course

**** The students shall undergo Internship training / field work for a minimum period of 14 working days at the end of the fourth semester during summer vacation and submit the report in the fifth semester which will be evaluated for 100 marks by the concerned guide and followed by an Internal Viva voce by the respective faculty or HOD as decided by the department. According to their marks, the grades will be awarded as given below.

Marks %	Grade
85 – 100	O
70 – 84	D
60 – 69	A
50 – 59	B
40 – 49	C
< 40	U (Reappear)

Major Elective Papers (2 papers are to be chosen from the following 6 papers)

1. Big Data and Analytics
2. Datamining and Warehousing
3. Cloud Computing
4. Internet of Things (IoT)
5. Block Chain
6. Software Project Management

Non-Major Elective Papers

1. Human Rights
2. Women's Rights
3. Consumer Affairs

Sub. Code & Title of the Extra Departmental Course (EDC):

26UCA5XL – Internet and Office Automation Lab

List of Cocurricular Activities:

1. National Cadet Corps (NCC)
2. National Service Scheme (NSS)
3. Youth Red Cross (YRC)
4. Physical Education (PYE)
5. Eco Club (ECC)
6. Red Ribbon Club (RRC)
7. Women Empowerment Cell (WEC)

Job Oriented Courses (JOC)

JOC - 1 - Open Source Designing Tools Lab

JOC - 2 - IoT Simulation Tools Lab

JOC - 3 - Data Visualization Lab

JOC - 4 - Mobile App Development using Open-Source Tools

Note: In core/ allied subjects, no. of papers both theory and practical are included wherever applicable. However, the total credits and marks for core/allied subjects remain the same as stated below.

Tally Table:

S.No.	Part	Subject	Marks	Credits
1.	I	Language – Tamil/Hindi/Malayalam/ French/ Sanskrit	400	12
2.	II	English	400	12
3.	III	Core – Theory/Practical	1600	60
		Allied	400	20
		Electives/Project	300	15
4.	IV	Basic Tamil / Advanced Tamil (OR) Non-major electives	150	4
		Skill Based subject	300	9
		EDC	100	3
		Environmental Studies	50	2
		Value Education	50	2
5.	V	Cocurricular Activities	50	1
		Total	3800	140

➤ 100 % CIA for Basics of Cyber Security, EDC and Basics of Intellectual Property Rights.

- The students should complete **Health and Wellness Programme (26UHW401)^{###}** in the **4th semester** and the completion marks should be submitted through the HoD to the Controller of Examinations. Extra credits will be given to the candidates who have successfully completed.
- The students should complete any **MOOC course available for Online learning platforms like SWAYAM, NPTEL, Coursera^{\$\$}, IIT Bombay Spoken Tutorial, e-Pathshala etc.,** before the completion of the **5th semester** and the course completion certificate should be submitted through the HoD to the Controller of Examinations. Appropriate credits will be given to the candidates who have successfully completed.

^{\$\$}Note: One course to be taken from coursera for all the under graduate students of self-finance stream during the even semester of the I year. **Appropriate extra credits^{@@@}** and certification as applicable shall be awarded to the students who have completed the course.

^{@@@}Note: Course Duration:

Duration	Extra Credits
< 10 hours	0
> =10 hours and < = 20 hours	1
> 20 hours	2

- An **Onsite Training** preferably relevant to the course may be undertaken as per the discretion of the HoD.
- Extra credits shall be awarded for innovative products/ individual paper presentations and publications in reputed national/ international proceedings and in indexed journals by the UG students for their original research contributions.
 - Product development through Technology Readiness Levels:
 - Phase 1 Level (TRL 1-3): Basic research: 1 credit
 - Phase 2 Level (TRL 4 -6): Development and validation: 2 credits
 - Phase 3 Level (TRL 7-9): Deployment: 3 credits
 - National / International level paper presentation in conferences and publications of full papers in reputed Scopus/ web of Science indexed journals
 - National Level : 1 credit/ paper
 - International Level : 2 credits/ paper
 - Open access Journals are not included
- Extra credits shall be awarded to students who prefer to opt any course out of their Programme on Self-learning mode. No internal components. 100% ESE.

Teaching Pedagogy

Smart Class Room/Power point presentation/Seminar/Quiz/Discussion/Flipped Classroom/
Peer Learning/Experimental Learning/Blended learning

Flipped Classroom

Preamble:

- Under flipped classroom model, students review foundational content before class, with class time dedicated to practice, discussion, and problem – solving where the role of the teachers will be facilitating discussions and enabling students to embark on a holistic learning perspective.

Work Instructions:

- One flipped session / unit is made mandatory and the course In-charge shall identify and specify the topic to be covered in the flipped session in the lesson plan.
- Detailed session plans must be intimated to all students at least one week in advance.
- Curated content such as LORs, video lectures, animations, and other relevant digital content shall be provided to students in advance to facilitate effective preparation for the flipped classroom session.

Peer Learning**Preamble:**

- Peer Assisted learning enables students to learn from each other sharing knowledge in a collaborative learning environment.
- Development of leadership skills and student engagement through student to student academic support.
- Reduce drop out/failure rates of the students and create a supportive academic culture where a high performing or trained student assists peers academically.

Work Instructions:

- Course In-charge shall supervise the programme by periodically reviewing its implementation, conducting review meetings, and monitoring the progress reports.
- Course In-charge shall identify 5 to 6 fast learners based on their academic performance in internal and external examinations.
- Course In-charge shall also identify students who require additional academic support and assign 4 to 5 such students to each fast learner to facilitate peer learning.
- This team will operate remedial classes on a peer learning mode as per the following:
 - a) One session / week / course and each session shall be for 30 minutes in duration, with follow-up learning activities.
 - b) The faculty In-charge shall review attendance records and monitor the academic progress of the students.

Blended learning**Preamble:**

- Blended learning integrates traditional in class instruction with digital tools exposing students to a myriad option for learning from subject experts across the globe.
- It is provided with online learning sessions on recorded videos, lecture captured sessions (included under guided library hours), digital resources, and guided sessions facilitated by internal faculty members and external experts through Zoom meets etc.,

Work Instructions:

- For every course, students will be motivated to attend additional webinar/online courses through any interactive learning tools such as, telepresence systems, podcasts, interactive videos etc. with minimum of 2 sessions/course and maximum of 3 sessions/course.

Components of Continuous Internal Assessment

Components		Marks	Total
Theory			
CIA I	75	(75+75 = 150/10) 15	25
CIA II	75		
Objective Capacity Testing */Seminar		5	
Attendance		5	
Practical			
CIA Practical		25	40
Observation Notebook		10	
Attendance		5	
Project			
Review		15	20
Regularity		5	
Theory (Allied) (External: 55 marks)			
CIA I	55	(55+55)	20
CIA II	55	Converted to 10	
Objective Capacity Testing */Seminar		5	
Attendance		5	

* Objective Capacity Testing:

For the first assessment, questions shall be set from 2 ½ units (25 questions) and evaluation for 5 marks. The assessment shall be conducted through any authentic online platform, one week prior to the commencement of I CIA theory examinations.

For the second assessment, questions shall be set from 2 ½ units (25 questions) and evaluation for 5 marks. The assessment shall be conducted through any authentic online platform, one week prior to the commencement of II CIA theory examinations.

The average of the first and second assessment scores shall be considered for the final **5 marks** allocation.

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remembering; **K2**-Understanding; **K3**-Applying; **K4**-Analyzing; **K5**-Evaluating

1. ESE Theory Examination:

(i) CIA I & II and ESE: 75 Marks

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	75
K1 – K5 Q11 to 15	B (Either or pattern)	5 x 5 = 25	Short Answers	
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 8 = 40	Descriptive / Detailed	

(ii) CIA I & II and ESE: 55 Marks (Theory Applicable Course)

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	55
K2 – K4 Q11 to 15	B (Either or pattern)	5 x 3 = 15	Short Answers	
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 6 = 30	Descriptive / Detailed	

2. ESE Practical Examination:

Knowledge Level	Section	Marks	Total
K3	Experiments Record Work	50	60
K4		10	
K5			

3. ESE Project Viva Voce:

Knowledge Level	Section	Marks	Total
K3	Project Report Viva voce	60	80
K4		20	
K5			

Scheme of Evaluation - Health and Wellness Programme (26UHW401)###

Part	Description	Mark
A	Report	40
B	Attendance	20
C	Activities (Observation during Practice)	40
Total		100

**MODALITIES FOR THE CONDUCT OF OPEN BOOK EXAMINATION
SYSTEM FOR THE COURSES BASICS OF CYBER SECURITY AND
FUNDAMENTALS OF INFORMATION SECURITY FOR ALL UG AND
PG PROGRAMMES RESPECTIVELY**

PREAMBLE

The Curriculum Development Cell (CDC) meeting was convened on 16.10.2025 and recommended to implement an open book examination system for the courses, Basics of Cyber Security and Fundamentals Information Security for all UG and PG programmes to improvise conceptual understanding skills, promote deep learning, enhance assessment quality and strengthen comprehensive skills, for the students to be admitted from the academic year 2026-2027 and onwards.

1.Purpose

To provide guidelines for conducting open book examinations that encourage critical thinking, application of knowledge, and analytical skills.

2.Scope

Applicable to Basics of Cyber Security and Fundamentals of Information Security courses for the undergraduate and postgraduate programmes respectively.

- ❖ Provide sample questions to familiarize them with the OBE style.
- ❖ All the Staff members should be familiar about the prescribed Books of the Basics of Cyber Security and Fundamentals of Information Security.
- ❖ Students are permitted to carry the prescribed Books (in original or xerox copy) duly signed by the respective staff in charge of courses to the examination Hall.
- ❖ Invigilators of the respective examination halls should permit the students with the prescribed book (in original or xerox copy) and not to allow the students with other than the prescribed Books.




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**KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
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**I THE MODALITIES FOR THE CONDUCT OF 100% CIA PRACTICAL
EXAMINATIONS (For EDC Courses)**

CONDUCT OF 100% CIA PRACTICAL EXAMINATIONS

1. The Students shall appear for **TWO** CIA practical examinations which are evaluated as 100% internal examinations.
2. The students must appear **TWO** CIA practical examinations compulsorily, since End of Semester examinations will NOT be conducted for the above said course.
3. If any of the student(s) could not appear for CIA Examinations, as per reasons mentioned in the College Calendar, re-examination shall be conducted as per the existing procedures and norms.

The CIA Practical Examination mark breakup for the Extra Departmental Courses (EDC) offered for the UG & PG Programme is given below:

S.No.	Component Distribution	Marks
1.	CIA Practical I – 60 marks converted to 30	30
2.	CIA Practical II – 60 marks converted to 30	30
3.	Continuous assessment of practical (Observation to be submitted*) (15 Experiments/Programs x 2 = 30 marks)	30
4.	Record	05
5.	Attendance	05
Total		100

* In case a student is absent for an Experiment/Program conducted on a particular day, the student will not be allowed to compensate that Experiment/Program and will be awarded zero for that particular Experiment/Program and shall be marked absent. In case any student has an attendance lack; the concerned faculty handling the course in consultation with HoD may permit the student who has an attendance lack to compensate one or two Experiment/Programs as the case may be to enable them to become eligible with mandate of 75% attendance to appear for the Continuous Internal Practical Examinations. However the compensated Experiment/Programs will not be awarded any marks whatsoever.




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**MODALITIES FOR THE CONDUCT OF 100% CIA FOR THE ONE
CREDIT SELF- STUDY COURSE AND THE MARK DISTRIBUTION
PATTERN FOR THE PART III THEORY PAPER OF APPLICABLE
COURSE**

PREAMBLE

The Curriculum Development Cell (CDC) meeting was convened on 16.10.2025 and recommended to have one credit Self Study Course for applicable programmes in both UG & PG programme in the V and II semester respectively for the students to be admitted from the academic year 2026-2027 and onwards.

In order to foster independent learning, enhance academic flexibility, and encourage students to explore knowledge, the institution introduces the One Credit Self Study Course. This initiative is designed to provide students with an opportunity to pursue structured self-learning during the regular programme of study.

The one credit Self Study Course for applicable UG & PG programme in the V and II semester respectively, for the students admitted from the academic year 2026-2027 and onwards.

1. CIA COMPONENTS FOR ONE CREDIT COURSE

CIA shall be conducted by the department concerned.

CIA I	50 (Converted to 10)	20	25
CIA II	50 (Converted to 10)		
Case Study		5	

QUESTION PAPER PATTERN

Duration : 2 Hours

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to Q6	A (Answer all)	6 x 1 = 6	MCQ	50
K2 – K4 Q7 to Q 10	B (Either or pattern)	4 x 5 = 20	Short Answers	
K2 – K5 Q11 to Q 13	C (Either or pattern)	3 x 8 = 24	Descriptive / Detailed	

2. PART III THEORY APPLICABLE COURSE
(CIA : 20 MARKS, ESE : 55 MARKS)**CIA: 20 Marks**

CIA I	55	(55+55)	20
CIA II	55	Converted to 10	
Objective Capacity Testing /Seminar		5	
Attendance		5	

ESE : 55 Marks**QUESTION PAPER PATTERN**

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	55
K2 – K4 Q11 to 15	B (Either or pattern)	5 x 3 = 15	Short Answers	
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 6 = 30	Descriptive / Detailed	



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**THE MODALITIES FOR THE CONDUCT OF 100% CIA
EXAMINATIONS**

PREAMBLE

As per the recommendations of the Curriculum Development Cell in its meeting held on 27.08.2021, and decision taken in the General Board of Studies meeting held on 16.03.2022, the courses **Cyber Security and Information Security** were introduced in the III semester for all the UG programmes and in the even semester for the PG programme respectively for the students admitted from the academic year 2022-2023 and onwards. Also, it was unanimously decided to conduct 100 % CIA examinations (No End of Semester Examinations) for these courses. The name of the Courses Cyber Security and Information Security are renamed as **Basics of Cyber Security** and **Fundamentals of Information Security** as per the decision taken in the General Board of Studies meeting held on 26.03.2026 for the students to be admitted from the academic year 2026-2027 & onwards. As per the recommendations of the Curriculum Development Cell in its meeting held on 07.03.2022, it was approved in the BOS meeting held on 19.03.2022 to conduct 100% CIA Examinations for the **Extra Departmental Courses** offered in the UG and PG Programmes for the students admitted from the academic year 2022-2023 and onwards. The cited decisions had been approved by the Academic council in its meeting held on 18.04.2022. As per the recommendations of the Curriculum Development Cell in its meeting held on 27.02.2024, and decision taken in the General Board of Studies meeting held on 02.05.2024, the course **Basics of IPR** was introduced in the VI semester for all the UG programmes for the students admitted from the academic year 2024-2025 and onwards and decided to conduct 100 % CIA examinations (NO End of Semester Examinations) for the course.

Hence, the modalities is recommended for the following:

- (i) Conduct of I & II CIA Examinations
- (ii) Question Paper Pattern
- (iii) CIA Examination Mark Breakup
- (iv) Attendance Calculation

CONDUCT OF I & II CIA EXAMINATIONS

1. The CIA Examinations I & II for the above said courses must be conducted along with the other courses under centralized system.
2. The students must appear I & II CIA Examinations compulsorily, since **End of Semester Examinations will NOT be conducted** for the above said courses.
3. If any of the student (s) could not appear for CIA Examinations for the above said courses, with reasons mentioned in the College Calendar, re-examination shall be conducted as per the existing procedures.

QUESTION PAPER PATTERN

The following question paper pattern will be followed for the above said courses:

Section A - Multiple Choice	(10 × 1 = 10 Marks)
Section B - Either or Type	(5 × 5 = 25 Marks)
Section C - Either or Type	(5 × 8 = 40 Marks)

Maximum Marks : 75

Duration : 3 Hours

CIA EXAMINATION MARK BREAKUP

The CIA Examination mark breakup for the courses **Basics of Cyber Security, Fundamentals of Information Security and Basics of IPR** is given below:

S.No.	Distribution Component	Marks
1	CIA I – 75 Marks Converted to 30	30
2	CIA II – 75 Marks Converted to 30	30
3	Seminar/Objective Capacity Testing	10
4	Seminar/Objective Capacity Testing	10
5	Attendance	05
6	Any Case Study related to Cyber Security (as a Group)	15
	Total	100

The CIA Examination mark breakup for the **Extra Departmental Courses** offered for UG/PG Programmes is given below:

S.No.	Distribution Component	Marks
1	CIA I – 75 Marks Converted to 40	40
2	CIA II – 75 Marks Converted to 40	40
3	Seminar/Objective Capacity Testing	05
4	Seminar/Objective Capacity Testing	05
5	Attendance	05
6	Others (Group Discussion, Flipped Class room, etc.,)	05
	Total	100

ATTENDANCE CALCULATION

1. Separate attendance register must be maintained for **Basics of Cyber Security, Fundamentals of Information Security and Basics of IPR** in the Department and the final consolidated Attendance must be submitted to the COE along with the assessment Marks.
2. The attendance must be calculated by using the following formula:
$$\text{Attendance percentage} = \frac{\text{Number of Classes attended}}{\text{Number of Classes conducted}} \times 100$$
3. The students should be allowed to write the CIA examinations as per the existing norms related to attendance. The staff in charge of the respective courses have the responsibility to calculate the attendance percentage and submit the same to the Coordinator of the CIA Examination Committee during the I CIA and II CIA Examinations.
4. If the staff in charge finds that students have not put up enough attendance during the I CIA Examinations, he/she shall counsel the student(s) appropriately so that at the end of the course they have sufficient Attendance.




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**MODALITIES FOR THE AWARD OF APPROPRIATE EXTRA CREDIT
TO THE STUDENTS WHO PREFER TO OPT ANY COURSE OUT OF
THEIR PROGRAMME ON SELF LEARNING MODE**

PREAMBLE

The Curriculum Development Cell (CDC) meeting was convened on 16.10.2025 and recommended to motivate the students to opt any course(s) other than their core programme of study (theory papers only) through self-learning mode and extra credits can be awarded on their successful completion. However, such students availing this option shall not opt for any of the 100% CIA courses. This skill set will broaden intellectual horizons, foster holistic and integrative learning and equip diverse skill sets. This is applicable for the students to be admitted from the academic year 2026-2027 and onwards.

1. Semester Restriction:

Students may choose the courses offered only within their current semester. Courses beyond the semester in which they are enrolled shall not be permitted.

2. Course Type:

Only **theory courses** may be opted under this provision. Practical courses, Extra Departmental Courses (EDC), and courses assessed entirely through Continuous Internal Assessment (CIA) shall not be eligible.

3. Evaluation Method:

A **100% End of Semester Examination (ESE)** shall be conducted for the chosen course.

4. Marks & Scheme:

The ESE shall be conducted in accordance with the marks prescribed for the particular course in the approved scheme, along with its corresponding credit allocation.

5. **Conversion of Marks:**

The marks obtained by the student in the ESE shall be converted to a scale of **100 marks** for uniformity.

6. **Award of Credits:**

The credits allotted to the course in the scheme shall be transferred to the student as **Extra Credit**, provided the student secures the prescribed pass mark in the ESE.




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UCA 1

Sub.Code: 26UCA101

Programme Code:10		Bachelor of Computer Applications		
Title of the Paper:		Core Paper 1 – Python Programming		
Batch 2026–2027	Hours Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To acquire programming skills in core Python and to learn and understand Python programming Basics and paradigm
2. To Learn core Python scripting elements such as variables and flow control structures
3. To learn and understand python looping, control statements and string manipulations.

Course Outcomes (CO)

K1 to K5	CO1	Develop algorithmic solutions to simple computational problems and read, write, execute by hand simple Python programs
	CO2	Structure simple Python programs for solving problems
	CO3	Decompose a Python program into functions and discover how to work with lists and sequence data.
	CO4	Represent compound data using Python lists, tuples, dictionaries.
	CO5	Analyze the granting and revoking permissions in cursors and Normalization forms.

Syllabus

UNIT I

(15 Hours)

Computer Hardware Architecture - Overview of Programming Languages - Overview of Programming Languages - Introduction to Python - Python Overview – Comments in Python - Python Identifiers - Reserved Keywords – Variables - Standard Data Types - Python Casting- Python Operators – Types of Operators - Statement and Expressions.

UNIT II

(15 Hours)

Creating String in Python - Strings indexing and splitting - Reassigning Strings- Deleting the String - String Operators - Multiline Strings- Built-in String Methods- Python String Formatting- Boolean Expressions – Python List– Various List Operation – Loop List - List Methods- Python Tuples – Various Tuples Operations – Loop Tuples -Tuple Methods- Python Dates.

UCA 2

Sub.Code: 26UCA101

UNIT III

(15 Hours)

Python Set –Various Set Operations – Loop Set – Set Methods – Python Dictionaries – Various Dictionaries Operations – Nested Dictionaries – Dictionary Methods - Python Conditions and Python IF Statement- Python IF ELIF ELSE Statements - Python nested IF statements- The pass Statement- Python Loops - Python while Loop Statements-Infinite Loop- for Loop Statements- Iterating by Sequence Index - Python nested loops.

UNIT IV

(15 Hours)

Python Numbers- Mathematical Functions- Random Number Functions- Python Functions - Calling a Function - Pass by reference vs value – Function Arguments - The return Statement -Python Lambda functions. Scope of Variables - Local Scope- Global Scope- Python Exceptions Handling - Assertions in Python- Handling an exception - Python User Input.

UNIT V

(15 Hours)

Python Files I/O File Handling: File Open- Read Only Parts of the File- Read Lines- Close Files- Python File Write Create a New File -Delete File- Delete Folder- Python Matplotlib. Introduction to web development: Overview of web frameworks – Web application development using Flask – Templates and form handling – Case Study: Student Record Management System using file handling – Log File Analyzer using exception handling – Web-based Application using Flask or Django.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text books

1. Allen B. Downey, (2024) “Think Python: How to Think Like a Computer Scientist”, 3rd Edition, O’Reilly Media Publishers.
2. Guido van Rossum, (2021) “An Introduction to Python – Updated for Python 3.9/3.10”, Shroff Publishers & Distributors.

Reference Books

- Eric Matthes, (2023) “Python Crash Course”, 3rd edition, Updated for Python 3.11, No Starch Press, (<https://nostarch.com/python-crash-course-3rd-edition>)
- John V. Guttag, (2021) “Introduction to Computation and Programming Using Python: With Application to Computational Modeling and Understanding Data”, 3rd Edition, MIT Press.
- Robert Sedgewick, Kevin Wayne, Robert Dondero, (2016) “Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd.
- Timothy A. Budd, (2015) “Exploring Python”, Mc-Graw Hill Education (India)Private Ltd.
- Kenneth A. Lambert, (2024) “Fundamentals of Python: First Programs”, 3rd Edition, Cengage Learning.

UCA 3

Sub.Code: 26UCA101

- Charles Dierbach, (2015) “Introduction to Computer Science Using Python: A Computational Problem-Solving Focus”, 2nd Edition, Wiley.
- Paul Gries, Jennifer Campbell and Jason Montojo, (2017) “Practical Programming: An Introduction to Computer Science Using Python 3”, 2nd Edition, Pragmatic Programmers, LLC.

Web References

1. **Python Software Foundation, (2026), “The Python Tutorial”, Available at: [Python Official Tutorial](#)**
2. **GeeksforGeeks, (2025), “Python Programming Tutorial”, Available at: [Python Tutorial – GeeksforGeeks](#)**
3. **GeeksforGeeks, (2025), “Flask Tutorial”, Available at: [Flask Web Development Tutorial](#)**
4. **Real Python, (2026), “Flask Tutorials”, Available at: [Real Python Flask Tutorials](#)**

MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	M	S	S
CO2	S	S	H	H	S
CO3	H	H	S	M	H
CO4	S	H	M	S	H
CO5	S	S	S	S	S

S – Strong

H – High

M – Medium

L – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10		Bachelor of Computer Applications		
Title of the Paper:		Core Practical 1 – Python Programming Lab		
Batch 2026 – 2027	Hours Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To develop problem-solving skills by implementing algorithms such as prime number generation and Fibonacci series using Python.
2. To understand basic programming constructs like loops, conditional statements, and pattern generation through practical exercises.
3. To gain knowledge of Python data structures such as lists, sets, and strings, and perform operations like union, intersection, and difference

Course Outcomes (CO)

K3 to K5	CO1	Apply fundamental programming concepts of Python such as loops, conditions, and functions to solve basic computational problems (e.g., prime numbers, Fibonacci series).
	CO2	Demonstrate the use of Python data structures like lists, sets, and strings, and perform operations such as union, intersection, and pattern generation.
	CO3	Analyze and process text data to extract meaningful information such as character count, vowels, and spaces.
	CO4	Implement error handling techniques using exception handling mechanisms to build robust programs.
	CO5	Design and develop object-oriented programs using concepts like inheritance

LIST OF PRACTICAL PROGRAMS

1. Write a Python program to print all the prime numbers within a given range.
2. Write a Python program to print the following pattern:

```

*
*  *
*  *  *

```
3. Write a Python script to create a list with different data types.

UCA 5

Sub. Code: 26UCA1CL

4. Write a Python script to perform Union, Intersection, difference and symmetric difference of given two sets.
5. Write a Python program to define a function that generates the Fibonacci series up to n numbers.
6. Write a Python script to get current time in milliseconds in Python
7. Write a Python script to handle simple errors by using exception handling mechanism
8. Write a Python program to accept a line of text and find the number of characters, number of vowels, and number of blank spaces in it.
9. Write a Python script to check whether password is valid or not. Conditions for a valid password are:
Should have at least one number. Should have at least one uppercase and one lowercase character.
Should have at least one special symbol. Should be between 6 to 20 characters long.
10. Write a Python script to implement single inheritance.
11. Write a NumPy program to generate a matrix product of two arrays.
12. Write a Python programming to display a bar chart using different color for each bar.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work – 10 Marks.
2. Algorithm, Program, Typing and Execution: 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

UCA 6**Sub. Code: 26UCA1CL****MAPPING**

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	H	M
CO2	S	S	M	H	H
CO3	S	H	H	S	M
CO4	H	S	M	H	M
CO5	S	S	S	H	H

S – Strong**H** – High**M** – Medium**L** – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	Core Paper 2 – Object Oriented Programming with Java			
Batch 2026-2027	Hours Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To obtain the basic knowledge of Object-Oriented Programming using the core Java programming language.
2. To understand the fundamentals of Constructors, and Method Overloading
3. To acquire the working principles of Arrays and Error handling mechanisms in Java.

Course Outcomes (CO)

K1 to K5	CO1	Acquiring knowledge of Object-Oriented Programming using Java programming Language
	CO2	Understanding and applying concepts of Arrays, Constructor and Overloading.
	CO3	Analyzing the concepts of Exception handling mechanisms in Java.
	CO4	Implementing Graphical User Interface using Applets, AWT & Swing Components.
	CO5	Evaluating the Java concepts with threads and I/O streams with relevant case studies.

Syllabus

UNIT I

(15 Hours)

Fundamentals of Object-Oriented Programming: Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. Java Evolution: History – Features – Java and Internet – Java and www – Web Browsers- Java Environment. Overview of Java: Simple Java program – Java program structure – Java Tokens – Java Statements – Implementing Java Programs - Java Virtual Machine.

UCA 8

Sub. Code: 26UCA202

UNIT II

(15 Hours)

Constants – Variables - Data Types –Declaration of variables - Scope of variables – Giving and Getting of Variables - Type Casting - Operators and Expressions – Decision Making and Branching: if, if...else, nested if, switch ?: Operator - Decision Making and Looping: while, do, for – Jumps in Loops - Labeled Loops.

UNIT III

(15 Hours)

Classes, Objects and Methods - Arrays, Strings and Vectors: Creation – One dimensional Array – Two-dimensional Array– Strings – Vectors – Wrapper Class – Enumerated Types - Interfaces: Multiple Inheritance – Packages: Putting Classes together – Multithreaded Programming.

UNIT IV

(15 Hours)

Managing Errors and Exceptions: Types of Errors- Compile-time and Runtime Errors – Exceptions – Using Finally Statements – Applet Programming – Graphics Programming.

UNIT V

(15 Hours)

Managing Input / Output Files in Java: Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive Data Types – Concatenating and Buffering Files Random Access Files. *

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Books:

1.E. Balagurusamy, “**Programming with Java**”, McGraw Hill Publication, 6th Edition, 2019.

Reference Books:

1. Patrick Naughton& Hebert Schildt, **The Complete Reference Java 2**, 3rd Edition, TMH.
2. John R. Hubbard, **Programming with Java**, 2nd Edition, TMH.

Web References:

1. <http://docs.oracle.com/javase/tutorial/java/concepts/index.html>
2. <http://hyperskill.org/tracks>
3. <http://www.codechef.com/learn/course/oops-java>

MAPPING

PSO CO	PSO1	PSO2	PS3	PSO4	PSO5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	H	S	M	H	S
CO4	S	M	S	M	H
CO5	S	H	S	S	H
S –Strong		H –High	M – Medium		L –Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	Core Practical 2 – Object Oriented Programming with Java Lab			
Batch 2026-2027	Hours Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

- 4.To understand the Object-Oriented principles of Java Programming.
- 5.To understand the Applications of Java Programming.
6. To apply the functions of Java programming.

Course Outcomes (CO)

K3 to K5	CO1	Designing the basic concepts of Object-Oriented Programming in Java Programming.
	CO2	Implementing arrays, constructor and exception handling mechanism using Java.
	CO3	Validating the basic networking operations using Java.
	CO4	Implementing Graphical User Interface using Applets, AWT & Swing Component.
	CO5	Evaluate the Java concepts with threads and I/O streams

LIST OF PRACTICAL PROGRAMS

1. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
2. Write a Java program to do all arithmetic operations.
3. Write a Java program that checks whether a given string is a palindrome or not.
4. Write a Java program to multiply two given matrices.
5. Write a Java program to create a Student class with the fields –
 - i. Register number ii. Student Name iii. Department. Create ‘n’ number of Student objects where ‘n’ value is passed as input to constructor.
6. Write a Java program that creates three threads. First thread displays “Good Morning

Everyone” every one second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.

7. Write a Java program that construct house using graphical components.
8. Develop simple calculator using Swings.
9. Write a Java program that reads a file and displays the file on the screen, and also displays the number of characters, lines and words in a text file.
10. Write a Java program that make the server receive a message from the client and sends it back.
11. Write a Java program that checks whether a given website is reachable using Java’s Inet Address.
12. Write a Java program that fetches the public IP address of the machine.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student(3Hours/60Marks)

1. Record Work-10 Marks
Algorithm, Program, Typing and Execution: 50 Marks

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

MAPPING

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	H	H
CO2	S	S	H	S	S
CO3	S	M	H	H	H
CO4	S	S	M	S	M
CO5	H	S	S	S	H

S - Strong**H** – High**M**–Medium**L** –Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	Core Paper 3 – RDBMS			
Batch 2026–2027	Hours Week 4	Total Hours 60	Credits 3	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. Understand Database Concepts – Explain DBMS, RDBMS, and Codd's Rules.
2. Design Efficient Databases – Create ER diagrams and apply normalization.
3. Use SQL Effectively – Execute DML, DDL, and DCL commands with constraints.

Course Outcomes (CO)

K1 to K5	CO1	Understanding the concepts of Database.
	CO2	Understanding the concept of Data Integrity constraints.
	CO3	Applying various DDL and DML statements, joins queries, PL / SQL statements.
	CO4	Applying various types of database management systems for developing the program.
	CO5	Evaluate the usage of normalization in relational database management system.

Syllabus

UNIT I

(12 Hours)

Introduction: Purpose of Database Systems-DBMS and RDBMS-Entity Relationship Diagram, Weak and Strong Entity sets – Codd's Rules. Normalization-Oracle Terminology – Data types - Basics of SQL :-DML-select command , insert , update, delete set operations, usage of Where Clause, DDL *,DCL-Operators Aggregate functions. UCA 19

UNIT II

(12 Hours)

Data Constraints: -NULL value Concepts-Default value Concepts-Primary Key concepts-Unique Key Concepts-Foreign Key Concepts-Check Key Integrity Constraints-Renaming Columns with Expression List-Range Searching-Pattern Searching Manipulating Strings and Dates.

UNIT III

(12 Hours)

Sophisticated queries-Built in group functions- Joined Relations-Nested Sub queries – Views – Sequences and Synonyms-Table Indexes- Table Partition and Joining of two tables.

UNIT IV

(12 Hours)

Database Triggers: – Use of Database Triggers-How to apply Database Triggers-Types of Triggers-Combinations-Key words and Parameters-Dropping Triggers-Basics of PL/SQL –Usage of Stored Functions and Procedures- -How do procedures reside-Parameters. Packages-Retrieving data with Cursors-Formatting table. Exception handling.

UNIT V

(12 Hours)

New Applications: Decision Support Systems - Data Analysis - Data Mining - Data Warehousing - Spatial and Geographic Databases - Multimedia Databases - Mobility and Personal Databases - Information - Retrieval Systems - Distributed Information Systems - The World Wide Web *. Working with Reports-Default tabular report- PL/SQL with reports.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Books:

1. Abraham Silberschatz , Henry F. Korth, S. Sudharshan,(2002),“Database System Concepts”, Fourth Edition -Tata McGraw Hill International Editions.
2. Ivan Bayross ,(2000), “Commercial Application Development using Oracle developer 2000”, BPB publications.

Reference Books:

1. Pratt, P. J., Adamski, J. J., (2021), “Concepts of Database Management”, Tenth Edition – Cengage – publication
2. David Loctman, (1997), “Developing Personal Oracle For Windows 95”, Sams Publishing, 2nd Revised Edition.
3. Elmasri Navathe,(2001), “Fundamentals of Database Systems”, First Edition- Pearson Education publication.
4. Sharad Maheshwari & Ruchin Jain,(2006),“Database Management Systems” Complete Practical Approach”, Second Edition
5. Nilesh Shah,(2007), “Database Systems using Oracle” A Simplified Guide to SQL & PL/SQL, Second Edition ,Prentice Hall of India Private Ltd, New Delhi.
6. Ivan Bayross,(1995),”Oracle 7 The Complete Reference”, BPB Publications.

Web References

1. <https://docs.oracle.com/en/database/>
2. <https://www.tutorialspoint.com/dbms/index.htm>
3. <https://learn.microsoft.com/en-us/sql/sql-server>

MAPPING

PSO CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	H	S	M	H	S
CO4	S	M	S	M	H
CO5	S	H	S	S	H

S – Strong**H – High****M – Medium****L – Low**

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	Core Practical 3 – RDBMS Lab			
Batch 2026-2027	Hours Week 4	Total Hours 60	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. Perform SQL Operations – Create, query, and manipulate tables using SQL.
2. Manage Databases – Implement views, sequences, and table modifications.
3. Develop PL/SQL Programs – Use procedures, functions, cursors, and triggers.

Course Outcomes (CO)

K3 to K5	CO1	Designing the basic concepts of Database.
	CO2	Implementing data Integrity constraints in Database.
	CO3	Validating the various fundamental tasks to perform data modeling.
	CO4	Implementing functions, packages, stored procedures and user defined exception.
	CO5	Evaluate the trigger function to perform event.

LIST OF PRACTICAL PROGRAMS

1. Creating Tables and writing simple queries using
 - a) Comparison Operators
 - b) Logical Operators
 - c) Set Operators
 - d) Sorting and Grouping
2. Creation of Reports using Column format
3. Writing Queries using built in functions.

UCA 17

Sub.Code: 26UCA3CN

4. Updating and altering tables using SQL.
5. Creation of Students Information table and write PL/SQL Block find the Total, Average marks and Results.
6. Design a PL/SQL block to prepare the Electricity Bill.
7. Programming with Cursors: Code a PL/SQL Block to partition the students Information Table into two, one with the Passed and other with Failed.
8. Implement the concepts of Joined relations to Database.
9. Create a Database Trigger to check the data validity of Record.
10. Recursive Functions Write a Recursive function to find
 - a) Factorial of N
 - b) Fibonacci Series with N terms.
11. Use SQL queries to manage Views, Sequences and Synonyms
12. Create a Database Trigger to implement the Master - Detail Relationship.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work - 10 Marks
2. Algorithm, Program, Typing and Execution: 50 Marks

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

UCA 18**Sub.Code: 26UCA3CN****MAPPING**

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	H	H
CO2	S	S	H	S	S
CO3	S	M	H	H	H
CO4	S	S	M	S	M
CO5	H	S	S	S	H

S – Strong**H** – High**M** – Medium**L** – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

UCA 19

Sub. Code: 26UCA3A3

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	Allied Paper 3 - Digital Marketing		
Batch 2026 – 2027	Hours/ Week 6	Total Hours 90	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To train the student to the basic concepts of the C-programming language.
2. To provide exposure to problem-solving through programming and to develop programming skills.
3. To learn and apply key programming constructs such as variables, constants, data types, operators and control structures.

Course Outcomes (CO)

K1 to K5	CO1	Understand basic digital marketing concepts.
	CO2	Learn how to use social media for promotion.
	CO3	Know how to improve website visibility.
	CO4	Create simple online advertisements.
	CO5	Analyze basic marketing results and performance.

Syllabus

Unit I

(18 Hours)

Introduction to Digital Marketing: Evolution of Digital Marketing – From Traditional to Modern Marketing – Growth of ‘E’ Concepts: from E-Business to Advanced E-Commerce. Digital Marketing: An Introduction – Digital Marketing Channels: Types and Business Models -Digital Marketing Applications and Benefits. Internet Marketing: Understanding Web and Wireless Technologies – Opportunities and Challenges to Internet Marketing. Digital Marketing Framework: ASCOR Digital Marketing Framework. Digital Marketing Models Creation: Digital Marketing Business Models.

Unit II

(18 Hours)

Digital Marketing Assessment Phase: The Assessment Phase Elements – Macro-Micro Environment Analysis. Digital Marketing Objectives Planning: Digital Presence Analysis – Digital Marketing Objectives Development - Digital Marketing Objectives Review. Digital Marketing Strategy Definition: Understanding Digital Strategy Groundwork – Emerging Digital Business Structures. Digital Marketing Strategy Roadmap: The 6S Digital Marketing Implementation Strategy.

Unit III

(18 Hours)

Digital Marketing Planning Development: The Media Planning Shift to Digital. Introduction to Digital Marketing Channels: Community-Based Marketing – Partner, Direct, Content and Platform-Based Marketing Channels. Basics of Web Development and Management: Website Development Stages. User Experience,

Usability and Service Quality Elements: Understanding Elements of User Experience – Understanding Web Usability and Evaluation.

Unit IV

(18 Hours)

Digital Marketing Campaign Management: Basic Elements of digital Campaign Management: Campaign Planning and Budgeting. Implementing Intent-Based Campaigns: SEO Basics and Management – Implementing Brand-Based Campaigns: Rich Media Ad Campaign Management. Managing Digital Marketing Revenues: Digital Revenue Generation Models – Rise of Relationships Marketing. Managing Service Delivery and Payment.

Unit V

(18 Hours)

Emerging Opportunities for Digital Marketing Professionals: The Changing Role of CMOs in Organizations – Building a Career in Digital Marketing – Top Digital Marketing Areas as Career Tracks – Approaching a Career in Digital Marketing.

Case Studies: Flipkart: Heralding Indian E-Commerce, Twitter India: Monetizing Communication*, Facebook India: Expanding the Network.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Book:

Puneet Singh Bhatia, “Fundamentals of Digital Marketing”, Second Edition, Pearson Education, 2019.

Reference Book:

1. Seema Gupta, “Digital Marketing”, 3rd edition, McGraw Hill Publications, 2023.
2. Moutusy Maity, “Digital Marketing”, 2nd edition, Oxford University Press, 2017.

Web References:

1. <https://www.geeksforgeeks.org/blogs/complete-digital-marketing-course-from-basic-to-advance/>
2. <https://www.geeksforgeeks.org/blogs/complete-digital-marketing-course-from-basic-to-advance/>

MAPPING

PSO CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	M	M	H
CO2	S	M	S	S	S
CO3	S	S	H	M	M
CO4	S	M	H	H	M
CO5	S	S	S	H	H

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	Core Paper 4 – Full Stack Development			
Batch 2026-2027	Hours Week 4	Total Hours 60	Credits 3	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To train the student to the basic concepts of the C-programming language.
2. To provide exposure to problem-solving through programming and to develop programming skills.
3. To learn and apply key programming constructs such as variables, constants, data types, operators and control structures.

Course Outcomes (CO)

K1 to K5	CO1	Developing programs using the control statements, Arrays and Strings.
	CO2	Understanding about the code reusability with the help of user defined functions.
	CO3	Developing programs using pointer, enumerated data types, function, Union and nested structures.
	CO4	Learning the file handling mechanism that is essential for storing and accessing data
	CO5	Determine efficient techniques in programming to solve various real time problems.

Syllabus

UNIT I

(12 Hours)

Web Development Fundamentals: Introduction to Web Development- How the Internet Works- Client-Server Architecture - HTTP & HTTPS-Setting Up Development Environment. HTML (Hyper Text Markup Language): Introduction to HTML5-Basic Structure of Web Pages-Headings, Paragraphs, and Text Formatting-Links, Images, Lists, and Tables-Forms and Input Elements-Semantic HTML.

UNIT II

(12 Hours)

CSS (Cascading Style Sheets): Introduction to CSS3-Selectors and Properties-Colors, Fonts, and Styling-Box Model-Flexbox-CSS Grid-Responsive Web Design-Media Queries-Bootstrap. JavaScript Fundamentals (Basics) -Introduction to JavaScript-Variables, Data Types, and Operators-Functions and Scope-Arrays and Objects-DOM Manipulation-Events and Event Handling-ES6+ Features

UNIT III

Advanced JavaScript: Asynchronous JavaScript-AJAX-Fetch API-Form Validation-Error Handling. PHP (Backend Development): Introduction to PHP-PHP Syntax and Variables Data Types and Operators-Conditional Statements-Loops-Functions in PHP-Arrays in PHP-Working with Forms-File Handling-Sessions and Cookies.

UNIT IV

(12 Hours)

MySQL (Database Management): Introduction to Databases-MySQL Installation & Setup- Creating Databases and Tables-CRUD Operations-SQL Queries (SELECT, INSERT, UPDATE, DELETE)-Joins and Relationships-Database Normalization. PHP & MySQL Integration- Connecting PHP with MySQL-Handling Form Data-Performing CRUD Operations Authentication System (Login & Registration)-Password Encryption

UNIT V

(12 Hours)

Version Control & Deployment: Git & GitHub Basics-Hosting a PHP Application-Domain & Server Setup-Introduction to C-Panel. Project Development: Building Dynamic Web Applications - API Integration - Testing and Debugging - case studies*.

***Self-Study and questions for examinations may be taken from the self-study portions also.**

Text Book:

1. "Web Development: Full Stack" (1st Edition): Suitable for beginners, this book covers the basics from user experience to dynamic web pages using PHP and MySQL.
2. Full Stack Web Development for Beginners.
3. PHP Programming for Beginners: The Simple Guide to Learning PHP Fast!
4. FULL STACK WEB DEVELOPMENT WITH MYSQL

Reference Books

1. Learning Web Design, Jennifer Niederst Robbins, O'Reilly Media, 5th Edition (2018)
2. HTML and CSS: Design and Build Websites, Jon Duckett, John Wiley & Sons, 2011

Web Resources

1. <https://www.freecodecamp.org/learn>
2. <https://www.geeksforgeeks.org/full-stack-developer>
3. <https://www.udemy.com/topic/full-stack-web-development/>

UCA 24**Sub. Code :26UCA404****MAPPING**

PSO CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	M	M	H
CO2	S	M	S	S	S
CO3	S	S	H	M	M
CO4	S	M	H	H	M
CO5	S	S	S	H	H

S –Strong**H –High****M– Medium****L –Low**

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	Core Practical 4 – Full Stack Development Lab			
Batch 2026-2027	Hours Week 4	Total Hours 60	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To understand and apply fundamental web development technologies including HTML, CSS, and JavaScript
2. To develop skills in designing responsive user interfaces, handling forms, performing client-side validation, like DOM manipulation and asynchronous operations.
3. To learn server-side programming using PHP and database management with MySQL.

Course Outcomes (CO)

K3 to K5	CO1	Demonstrate the ability to create structured web pages using HTML , including different types of lists, forms, and input elements.
	CO2	Apply CSS techniques for styling and layout, including internal CSS, Flexbox/Grid layouts, responsive design using media queries, and aesthetic enhancements like colours, fonts, and the box model.
	CO3	Develop interactive web applications using JavaScript , including variables, data types, functions, arrays/objects, DOM manipulation, event handling, form validation, and asynchronous operations using the Fetch API.
	CO4	Design and implement server-side functionality using PHP and MySQL , including form processing, session management, CRUD operations, user authentication, password encryption, and integration with dynamic web applications.
	CO5	Demonstrate the ability to use version control and deployment tools such as Git, GitHub, and basic web hosting concepts to manage, deploy, and maintain web applications.

LIST OF PRACTICAL PROGRAMS

1. Write an HTML program to create a web page that demonstrates different types of lists.
2. Write an HTML program to design a student registration form that includes Text input fields for name and email, a dropdown list to select a course, list of skills using checkboxes (HTML, CSS, JavaScript) and a submit button.
3. Write an HTML program with internal CSS to design a responsive web page. The page should include Use of CSS selectors and properties, Styling with colors, fonts, and the box model, A layout using **Flexbox or CSS**

Grid, A media query to make the page responsive for mobile devices.

4. Write an HTML program with embedded JavaScript that demonstrates Use of variables, data types, and operators, A function to perform a simple calculation, An array or object, DOM manipulation to display output on the webpage, Event handling using a button click.
5. Write an HTML program using JavaScript to create a user form that includes Input fields for name and email, Form validation to ensure fields are not empty, Use of **Fetch API (asynchronous JavaScript)** to send data to a server, Proper **error handling** to display success or failure message, Event handling using form submission.
6. Write a PHP program to create a form that accepts user details (name and age) and performs the following
Uses PHP syntax, variables, and data types, Processes form data using POST method, Stores the data in a file, Uses **sessions** to store and display the username, Displays the submitted data on the webpage.
7. Write a program to create a database and a table in MySQL for storing student details (ID, Name, Age, Course).
The program should Create a database and table, Perform **CRUD operations like** Insert new student records, Display all records using SELECT, Update a student record, Delete a student record, Use appropriate SQL queries.
8. Write a PHP program to design a **user registration and login system** using MySQL database. The program should Connect PHP with MySQL database, Create a registration form and store user data in the database, Encrypt the password before storing (password hashing), Create a login form to validate user credentials, Use sessions to maintain user login state, Display a success message after login.
9. Write a step-by-step program to demonstrate the use of Git and GitHub for version control and deployment of a web application. The program should include Initializing a Git repository, Adding and committing files, Connecting to a GitHub repository and pushing code, Hosting a PHP application on a server, Basic steps involved in domain and server setup, Introduction to cPanel for managing the hosted application.
10. Write a program to develop a simple dynamic web application that includes Integration of an external API to fetch and display data, Use of PHP or JavaScript for dynamic content, Form handling for user input, Basic testing and debugging techniques, Displaying the output in a structured format on a webpage.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work - 10 Marks
2. Algorithm, Program, Typing and Execution: 50 Marks.

UCA 27**Sub. Code: 26UCA4CO**

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

MAPPING

PSO CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	H	S
CO2	S	H	S	M	M
CO3	H	S	H	S	S
CO4	H	M	H	H	H

S –Strong**H** –High**M**– Medium**L** –Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper:	Allied Paper 4 – Data Structures			
Batch 2026-2027	Hours Week 6	Total Hours 90	Credits 5	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To introduce the fundamental concept of data structures.
2. To emphasize the importance of data structures in developing and implementing efficient algorithms.
3. Understand the need for Data Structures when building application.

Course Outcome (CO)

K1 TO K5	CO1	Understand the basic concepts of data structures and algorithms.
	CO2	Construct and analyze of stack and queue operations with illustrations.
	CO3	Enhance the knowledge of Linked List and dynamic storage management.
	CO4	Demonstrate the concept of trees and its applications.
	CO5	Design and implement various sorting and searching algorithms for applications and understand the concept of file organizations.

Syllabus**UNIT I****(18 Hours)**

Introduction of Algorithms, Analyzing Algorithms. Arrays: Sparse Matrices - Representation of Arrays. Stacks and Queues. Fundamentals–Evaluation of Expression Infix to Postfix Conversion – Multiple Stacks and Queues.

UNIT II**(18 Hours)**

Linked List: Singly Linked List – Linked Stacks and Queues – Polynomial Addition- More on Linked Lists – Sparse Matrices – Doubly Linked List and Dynamic – Storage Management – Garbage Collection and Compaction.

UCA 29

Sub.Code: 26UCA4A4
(18 Hours)

UNIT III

Basic Terminology – Binary Trees – Binary Tree Representations – Binary Trees- Traversal-More on Binary Trees – Threaded Binary Trees – Binary Tree. Representation of Trees – Counting Binary Trees. Graphs: Terminology and Representations-Traversals, Connected Components and Spanning Trees, Shortest Paths and Transitive Closure.

UNIT IV

(18 Hours)

Storage Devices–Sorting with Disks: K-Way Merging–Sorting with Tapes Symbol Tables: Static Tree Tables–Dynamic Tree Tables–Hash Tables: Hashing Functions–Overflow Handling.

UNIT V

(18 Hours)

Files - queries and sequential organizations * - index techniques. File organizations sequential, random, linked organizations - inverted files - cellular partitions.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Book:

1. Ellis Horowitz & Sartaj Sahani , (2008)- "Fundamentals of data structure", First Edition Galgothia book source.

Reference Books:

1. Ashok N Kamthane, (2004), “Programming and Data Structures”, First Edition, Pearson Education.
2. Alfred V. Aho, JohnE. Hopcroft, Jeffrey D.Ullman,(2008) – “Data Structures and algorithms”, Pearson Education.

Web References:

1. <https://www.programiz.com/dsa?>
2. <https://www.freecodecamp.org/learn/>
3. <https://www.hackerrank.com/domains/data-structures>

UCA 30**Sub.Code: 26UCA4A4****MAPPING**

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S
CO2	S	H	H	H	S
CO3	H	H	S	M	H
CO4	S	H	M	S	L
CO5	H	S	S	H	M

S – Strong**H –High****M–Medium****L–Low**

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	Core Paper 5 – Software Engineering			
Batch 2026 – 2027	Hours Week 6	Total Hours 90	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To understand Software Engineering fundamentals.
2. To explore software development life cycle (SDLC) models.
3. To Apply Software Design and Development Techniques.

Course Outcomes (CO)

K1 to K5	CO1	Learning the fundamentals of software engineering concepts.
	CO2	Understanding common lifecycle processes such as waterfall model, spiral model, prototyping model, evolutionary models etc.,
	CO3	Applying the principles and techniques of software engineering in the architectural design, detail design, and implementation of software applications.
	CO4	Developing the software using different testing concepts.
	CO5	Evaluating the ability of students to perform various lifecycle activities like Analysis, Design, Implementation, Testing and Maintenance.

Syllabus

UNIT I

(18 Hours)

Introduction to Software Engineering: Introduction: Professional Software Development: Software Engineering-Software Engineering diversity-Internet Software Engineering-Software Engineering Ethics: Case Studies-An insulin pump control system -Software Processes: Software Process Models- Waterfall Model-Incremental Development-Integration and Configuration.

UNIT II (18 Hours)

Process Activities: Software Specification-Software design and Implementation- Software Validation- Software Evolution-Requirements Engineering: Functional and Non-Functional Requirements- Requirements Engineering Process-Requirements Elicitation- Requirements elicitation Techniques- Stories and Scenarios-Requirements Specification: Natural Language Specification-Structured Specification-Use cases-The Software Requirements document.

UNIT III (18 Hours)

Architectural Design: Architectural design decisions: Architectural views- Architectural patterns: Layered Architecture-Repository Architecture-Client-Server Architecture-Pipe and Filter Architecture. Software Testing: Development Testing: Unit Testing-Choosing unit test cases- Component testing- System testing- Test-Driven Development: Release Testing: Requirement based testing-Scenario testing-Performance testing-User Testing.

UNIT IV (19 Hours)

Software Management: Project Management-Risk Management -Risk Identification-Risk Analysis-Risk Planning-Risk monitoring-Managing People: *Motivating People-Team work: Selecting group members-Group organization-Group Communications. Project Planning: Software Pricing-Plan-driven Development-Project Plans-The Planning Process- Project Scheduling: Schedule Presentation- Estimation Techniques: Algorithmic Cost Modelling- COCOMO Cost Modelling: The Application Composition Model-The early design Model-The reuse Model-Post Architectural level-Project Duration and Staffing.

UNIT V (17 Hours)

Quality Management: Software Quality-Software Standards-The ISO 9001 standards framework- Reviews and Inspections: The review process-program Inspections. Quality Management and Agile Development: Software Measurement: Product Metrics-Software Component Analysis-Measurement Ambiguity-Software Analyst.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Book:

1. Ian Sommerville, Software Engineering 10e”, Pearson India Education Services Pvt Ltd-10th Edition 2018

Reference Books:

1. "Software Engineering" by Udit Agarwal – 1st Edition (2023), Publisher: Wiley India, A newer Indian author offering concise content for BTech and MTech-level students.
2. Sommerville, (2006), “Software Engineering”, Pearson India Education Services Pvt Ltd-10th Edition (reprint)
3. Software Engineering, (2007),” Principles and Practices- Vikas Publishing House Pvt Ltd, ITL Education Solutions Ltd.
4. Software Engineering, (2008),” Principles and Practices-Waman S.Jawadekar-Tata McGrawhill Publishing Company limited, (7th reprint)
5. Rajib Mall (2007),” Fundamentals of Software Engineering”- Prentice Hall of India private Ltd - Second Edition 20th Printing.

Web References:

1. <https://www.edx.org/learn/software-engineering>
2. <https://online.stanford.edu/courses/cs>
3. <https://www.ibm.com/training/software-engineering>

UCA 34**Sub.Code: 26UCA505****MAPPING**

PSO CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	M	H
CO2	S	M	H	S	M
CO3	S	H	M	H	S
CO4	S	S	H	M	H
CO5	S	S	S	H	H

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	Core Paper 6 – Operating Systems			
Batch 2026-2027	Hours Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. Understand OS fundamentals: hardware, memory, and process management.
2. Explore process models, IPC, and thread management.
3. Analyze scheduling, memory management, and virtual memory.

Course Outcomes (CO)

K1 TO K5	CO1	Explain operating system concepts, architecture, and different types of OS structures.
	CO2	Describe process models, inter-process communication, and thread management.
	CO3	Analyze CPU scheduling algorithms, memory management techniques, and page replacement strategies.
	CO4	Evaluate file system structures, disk space management, and backup techniques.
	CO5	Understand deadlocks, I/O software and hardware principles, and compare I/O management in Linux and Windows.

Syllabus

UNIT I

(15 Hours)

Introduction - history of operating system-processors - computer hardware - memory - disk - input and output devices - buses - different kinds of operating system – Operating system concepts – System calls- Operating system structure - monolithic - layered - microkernel - client/server models – virtual machines.

UNIT II

(15 Hours)

Processes -process model -process creation - process termination -process hierarchies - process states- threads - thread model and usage- classical thread model- inter process communication – race conditions - critical regions - semaphores– mutexes.

UNIT III (15 Hours)

Introduction to scheduling - scheduling in batch systems - interactive systems -real time systems – Thread Scheduling - Memory Abstraction -notion of an address space -swapping - managing free space – Virtual Memory - Page replacement algorithms - design issues for paging systems – Segmentation.

UNIT IV (15 Hours)

Files-File Naming-File Structure-File Types-File Access-File Attributes-File Operations-Directories: Single Level – Hierarchical Level-Path Names – File System Implementation – File System Layout – Implementation Files – Implementation Directories.

UNIT V (15 Hours)

Introduction to Deadlocks - conditions for deadlocks-deadlock modeling-deadlock detection and recovery-deadlocks avoidance - deadlock prevention. Input / Output: Principles of Hardware: I/O Devices – Memory Mapped I/O – Direct Memory Access - Case Study: I/O Management in Linux and Windows*.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Book:

1. Andrew S. Tanenbaum, 2015, "Modern Operating Systems", 4th Edition, PHI New Delhi.

Reference Books:

1. Silberschatz, A., Galvin, P. B., & Gagne, G., 2022, *Operating System Concepts*, 10th Edition, Wiley, Hoboken.
2. William Stallings, 2018, "Operating Systems - Internals & Design Principles", (9th Edition, PHI private Ltd, New Delhi.
3. Sridhar Vaidyanathan, 2014, "Operating System", 1st Edition, Vijay Nicole Publications.
4. Abraham Silberschatz, Greg Gagne, Peter B. Galvin, 2018, "Operating Systems Concepts", 10th Edition, John Wiley.

Web References:

1. <https://www.edx.org/learn/operating-systems>
2. <https://www.coursera.org/courses?query=operating+systems>
3. <https://www.w3schools.in/operating-system/>

MAPPING

PSO CO	PSO1	PSO1	PSO1	PSO1	PSO1
CO1	S	S	M	S	S
CO2	S	H	H	H	S
CO3	H	H	S	M	H
CO4	S	H	M	S	L
CO5	H	S	S	H	M

S – Strong **H** – High **M** – Medium **L** – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper: Core Paper 7 - Artificial Intelligence and Machine Learning				
Batch 2026 - 2027	Hours Week 5	Total Hours 75	Credits 3	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To learn the concepts of Artificial Intelligence.
2. Create awareness of informed search, exploration methods, Planning, and knowledge discovery.
3. To demonstrate ML techniques for problem-solving using benchmark datasets.

Course Outcomes (CO)

K1 to K5	CO1	Analyze and evaluate informed search and exploration methods.
	CO2	Apply AI techniques for knowledge representation, planning, and decision-making.
	CO3	Analyze and develop knowledge of Communication and learning methods for real-time application
	CO4	Demonstrate Machine Learning algorithms with example Problems
	CO5	Explore how ML is already being used and evaluate problem areas of AI

Syllabus

UNIT I

(15 Hours)

Problem Solving: Search algorithm – Uniformed Search Strategies - Informed Search Strategies – Heuristic Functions - Propositional logic: A very-simple logic. First order logic: Representation revisited – Syntax and semantics for first-order logic –Using first order logic. Inference in First order logic: propositional versus first order logic –forward chaining – backward chaining

UNIT II

Automated Planning: Algorithm for classical Planning – Heuristic for planning – Hierarchical Planning. Quantifying Uncertainty: Bayes's Rule and Its use – Naïve Bayes Models. Making Simple Decisions: The basis of Utility theory – multi-attribute utility functions – Decision networks – The value of information.

UNIT III

(15 Hours)

Knowledge Based Learning: A Logical Formulation of Learning – Knowledge in Learning – Explanation Based Learning – Learning using Relevance Information. Reinforcement Learning: Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning. Communication: Grammar – Parsing – Augmented grammar.

UNIT IV

(15 Hours)

Introduction to ML: Machine Learning – Aspects of ML – ML Applications and Examples. Supervised and unsupervised Learning – Clustering: k-means Clustering – Fuzzy Clustering. Artificial Neural Network: ANN Basics – The Perceptron – RBF Network. Association Rule Mining: Apriori Algorithm- Case Study: Decision Making with IKS.

UNIT V

(15 Hours)

Deep Learning: Convolutional Neural Network – TensorFlow. Support Vector Machine – Ensemble Classifier: Types of Ensembles – Algorithm based on Bagging and Boosting – Decision Tree: Decision Tree Algorithm – Decision Tree and Random Forests*.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Books:

1. Stuart Russell, Peter Norvig, (2023) “Artificial Intelligence – A Modern Approach”, Fourth Edition, Pearson Education / Prentice Hall of India.
2. Vinod Chandra S. S, Anand Hareendran S, “Machine Learning: A Practitioner's Approach”, PHI Learning, 2024

Reference Books:

1. Elaine Rich, Kevin Knight, Shivashankar, B. Nair, (2009), “Artificial Intelligence”, Tata Mc Graw Hill Publishing Company Limited. Third Edition.
2. Nils J. Nilsson, (2000), “Artificial Intelligence: A new Synthesis”, Harcourt Asia Pvt. Ltd...
3. George F. Luger, (2002), “Artificial Intelligence-Structures and Strategies for Complex Problem Solving”, Pearson Education / PHI.

Web References:

1. <https://developers.google.com/machine-learning/crash-course>
2. <https://www.kaggle.com/learn/machine-learning>
3. <https://learn.microsoft.com/en-us/training/paths/introduction-to-ai/>

MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	M	S	H	H	S
CO4	S	M	S	M	H
CO5	S	S	M	H	S

S – Strong**H** – High**M** – Medium**L** – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper: Core Practical 5 - Artificial Intelligence and Machine Learning Lab				
Batch 2026-2027	Hours Week 6	Total Hours 90	Credits 3	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. Be able to create loops and decision statements in Python.
2. Be able to work with functions and pass arguments in Python.
3. To familiarize the students with working in advanced concepts in Python.

Course Outcomes (CO)

K3 to K5	CO1	Understand the basic concepts of Python.
	CO2	Understand the fundamentals of knowledge representation, Search Algorithms and inference.
	CO3	Understand the fundamentals of theorem proving using AI tools.
	CO4	Demonstrate working knowledge of reasoning in incomplete and/or uncertain information.
	CO5	Apply ML techniques and technologies to solve real-world problems.

LIST OF PRACTICAL PROGRAMS

1. Program to implement Informed Search Technique: A* Algorithm.
2. Program to Implement 8-Puzzle problem using Python.
3. Program to Implement Alpha-Beta Pruning using Python.
4. Program to Implement Monkey Banana Problem using Python
5. Program to Implement Tower of Hanoi using Python.
6. Program to Implement Alpha-Beta Pruning using Python.
7. Program to Implement the Water-Jug problem using Python.
8. Write a program to implement the k-Nearest Neighbour algorithm to classify the iris data set.

Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.

9. Build an Artificial Neural Network by implementing the Back propagation algorithm and test the same using appropriate data sets.
10. Program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering a few test data sets.
11. Apply the EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using the k-Means algorithm. Compare the results of these two algorithms and comment on the clustering quality. You can add Java/Python ML library classes/API to the program.
12. Implement the non-parametric Locally Weighted Regression algorithm to fit data points. Select appropriate data set for your experiment and draw graphs.

Guide lines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work – 10 Marks
2. Algorithm, Program, Typing, and Execution: 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	H	S
CO2	S	H	S	M	M
CO3	H	S	H	S	S
CO4	H	M	H	H	H
CO5	H	S	S	H	M

S– Strong **H** –High **M**–Medium **L** –Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper:		Natural Language Processing	
Batch 2026-2027	Hours / Week 1	Total Hours 15	Credits 1

Course Objectives

1. To teach the fundamentals of NLP, and to make them for understanding CFG, PCFG in NLP.
2. To know the role of semantics of sentences and pragmatic.
3. To teach the basic concepts of speech processing along with analysis and modeling.

Course Outcomes (CO)

K1 to K5	CO1	learn the fundamentals of natural language processing
	CO2	understand the use of CFG and PCFG in NLP
	CO3	understand the role of semantics of sentences and pragmatic
	CO4	Introduce Speech Production and Related Parameters of Speech.
	CO5	Show The Computation and use of Techniques such as Short Time Fourier Transform, Linear Predictive Coefficients and other Co-efficients in the Analysis of Speech.

Syllabus

UNIT 1: (3 Hours)

Introduction: Origins and challenges of NLP – language modeling: grammar-based LM, statistical LM – regular expressions, finite-state automata – English morphology, transducers for lexicon and rules, tokenization, detecting and correcting spelling errors, minimum edit distance.

UNIT 2: (3 Hours)

Word Level Analysis: Unsmoothed n-grams, evaluating n-grams, smoothing, interpolation and backoff – word classes, part-of-speech tagging, rule-based, stochastic and transformation-based tagging, issues in pos tagging – hidden markov and maximum entropy models.

UNIT 3: (3 Hours)

Syntactic Analysis: Context free grammars, grammar rules for english, treebanks, normal forms for grammar – dependency grammar – syntactic parsing, ambiguity, dynamic programming parsing – shallow parsing – probabilistic cfg, probabilistic cyk, probabilistic lexicalized cfgs – feature structures, unification of feature structures.

UNIT 4: (3 Hours)

Semantics And Pragmatics: Requirements for representation, first-order logic, description logics – syntax-driven semantic analysis, semantic attachments – word senses, relations between senses, The matic roles, selectional restrictions – word sense disambiguation, wsd using supervised.

UNIT 5:

Basic Concepts of Speech Processing: Speech fundamentals: articulatory phonetics – production and classification of speech sounds; acoustic phonetics – acoustics of speech production; review of digital signal processing concepts; short-time Fourier transform, filter- bank and lpc methods.

Text Books:

1. Daniel Jurafsky, James H. Martin—Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, Pearson Publication, 2014.
2. Steven Bird, Ewan Klein and Edward Loper, —Natural Language Processing with Python, First Edition, OReilly Media, 2009.
3. Lawrence Rabiner And Biing-Hwang Juang, “Fundamentals of Speech Recognition”, Pearson Education, 2003.

Reference Books:

1. Frederick Jelinek, “Statistical Methods of Speech Recognition”, MIT Press, 1997.
2. Breck Baldwin, —Language Processing with Java and LingPipe Cookbook, Atlantic Publisher, 2015
3. Richard M Reese, —Natural Language Processing with Java, OReilly Media, 2015.

Web References:

1. <https://www.nltk.org/book/ch03.html>
2. <https://www.nltk.org/book/ch05.html>
3. <https://www.nltk.org/book/ch08.html>

UCA 46**Sub.Code: 26UCA50P****MAPPING**

PSO CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	M	S	S
CO2	S	S	H	H	S
CO3	H	H	S	M	H
CO4	S	H	M	S	H
CO5	S	S	S	S	S

S – Strong**H – High****M – Medium L – Low**

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

**KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
COIMBATORE – 641029**

**MODALITIES FOR THE CONDUCT OF 100% CIA FOR THE ONE
CREDIT SELF- STUDY COURSE AND THE MARK DISTRIBUTION
PATTERN FOR THE PART III THEORY PAPER OF APPLICABLE
COURSE**

PREAMBLE

The Curriculum Development Cell (CDC) meeting was convened on 16.10.2025 and recommended to have one credit Self Study Course for applicable programmes in both UG & PG programme in the V and II semester respectively for the students to be admitted from the academic year 2026-2027 and onwards.

In order to foster independent learning, enhance academic flexibility, and encourage students to explore knowledge, the institution introduces the One Credit Self Study Course. This initiative is designed to provide students with an opportunity to pursue structured self-learning during the regular programme of study.

The one credit Self Study Course for applicable UG & PG programme in the V and II semester respectively, for the students admitted from the academic year 2026-2027 and onwards.

1. CIA COMPONENTS FOR ONE CREDIT COURSE

CIA shall be conducted by the department concerned.

CIA I	50 (Converted to 10)	20	25
CIA II	50 (Converted to 10)		
Case Study		5	

Q16 to 20	pattern)	30	Detailed	
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PRINCIPAL
PRINCIPAL
Kongunadu Arts & Science College
Coimbatore - 641 029

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper:	Core Paper 8 - Data Science with R Programming and Data Analytics			
Batch 2026-2027	Hours Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To learn about basics of Data Science and R.
2. To learn about overview and building process of Data Science.
3. To learn about the importance of Machine Learning.

Course Outcomes

K1 to K5	CO1	Understand the basics in Data Science and Big data
	CO2	Understand overview and building process in Data Science.
	CO3	Understand the need, types and applications of Machine Learning.
	CO4	Understand how to handle large data sets in Data Science.
	CO5	Case study in Data Analysis and various R operations.

Syllabus

UNIT I

(14Hours)

Defining Data Science and Big Data, Benefits and Uses, Faculties of Data, Data Science Process. History and Overview of R, Getting Started with R, R Nuts and Bolts: Entering Input – Creating Vectors – Lists, Factors, Data Frames.

UNIT II

(15 Hours)

The Data Science Process: Overview of the Data Science Process- Setting the research goal, Retrieving Data, Data Preparation, Exploration, Modeling, Data Presentation, and Automation. Getting Data in and out of R, Using reader package.

UNIT III**(15 Hours)**

Machine Learning: Understanding why data scientists use machine learning- What Machine learning and why we should care about, Applications of machine learning in data science, where it is used in data science, The modeling process, Types of Machine Learning-Supervised and Unsupervised.

UNIT IV**(15 Hours)**

Handling large Data on a Single Computer: The problems we face when handling large data, General Techniques for handling large volumes of data, Generating programming tips for dealing with large datasets, Sub setting R objects.

UNIT V**(16 Hours)**

Vectorized Operations, Managing Data Frames with the dplyr, Control structures, functions, Coding Standards in R, Loop Functions, Debugging, Simulation. Case studies on preliminary data analysis*.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Books:

1. Davy Cielen, Arno D. B. Meysman, Mohamed Ali, "Introducing Data Science", manning publications 2016.
2. Roger D. Peng, "R Programming for DataScience" Lean Publishing, 2015.

Reference Books:

1. Biecek, P., & Burzykowski, T., 2021, Explanatory Model Analysis, Chapman and Hall/CRC, Boca Raton.
2. Nina Zumel, John Mount, "Practical Data Science with R", Manning Publications, 2014.
3. Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, Abhijit Dasgupta, "Practical Data Science Cookbook", Packt Publishing Ltd., 2014. WebReferences for case studies:
 1. <https://www.kaggle.com/datasets>

UCA 49

Sub Code: 26UCA608

Web References:

1. <https://www.kaggle.com/learn>
2. <https://www.geeksforgeeks.org/data-science-tutorial/>
3. <https://www.freecodecamp.org/learn/data-analysis-with-python/>

MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	M	S	H	H	S
CO4	S	M	S	M	H
CO5	S	S	M	H	S

S – Strong

H – High

M – Medium

L – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper: Core Practical 6 – Data Science with R Programming and Data Analytics Lab				
Batch 2026-2027	Hours/ Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. Understand and Apply R Basics – Create and manipulate vectors, lists, and data structures.
2. Perform Data Operations – Utilize built-in functions like sum(), min(), max(), and seq() for computations.
3. Implement Text and Data Processing – Use functions like grep(), toupper(), tolower(), and substr() for text manipulation.

Course Outcomes (CO)

K3 to K5	CO1	Understand the basics in R programming in terms of constructs, control statements, string functions
	CO2	Understand the processes of WE identifying the problem to be solved, data collection, preparation, modeling, evaluation and visualization.
	CO3	Understand the basics of statistical computing and data analysis.
	CO4	Extract data from files and other sources and perform various data manipulation on them.
	CO5	Apply the R programming from a statistical perspective

LIST OF PRACTICAL PROGRAMS

1. Create a vector in R and perform operations on it.
2. Write code in R to demonstrate sum(), min(), max() and seq() functions.
3. Write code in R to manipulate text in R using grep(), toupper(), tolower() and substr() functions.
4. Write a program to find list of even numbers from 1 to n using R-Loops.
5. Implement different data structures and perform operations on it (Matrices, Data frames).

6. Demonstrate the visualization and graphics using visualization packages like ggplot2.
7. Implement Loop functions with lapply(), sapply(), tapply(), apply(), mapply().
8. Explore data using Single Variables: Unimodal, Bimodal, Histograms, Density Plots, Bar charts.
9. Explore data using two Variables: Line plots, Scatter Plots, Bar charts
10. Explore and implement commands using dplyr package.
11. Write a program to read a csv file and analyze the data in the file in R.
12. Create a data set and do statistical analysis on the data using R.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work - 10 Marks
2. Algorithm, Program, Typing and Execution: 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	S	M	M	M
CO2	S	H	S	M	M
CO3	M	S	H	M	M
CO4	M	M	M	H	S
CO5	M	M	M	S	H

S – Strong H – High

M – Medium

L – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper:	Core Practical 7- DevOps Lab			
Batch 2026-2027	Hours Week 4	Total Hours 60	Credits 3	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To understand the fundamentals of DevOps practices including continuous integration and continuous deployment (CI/CD).
2. To gain hands-on experience with version control systems such as Git for source code management.
3. To learn branching, merging, and collaboration techniques in distributed development environments.

Course Outcomes (CO)

K3 to K5	CO1	Understand basic DevOps concepts and tools.
	CO2	Learn version control using Git.
	CO3	Practice continuous integration and continuous deployment (CI/CD)
	CO4	Work with containerization tools like Docker.
	CO5	Develop skills to automate software development and deployment processes.

LIST OF PRACTICAL PROBLEMS

1. Write a program to initialize a Git repository and perform the first commit.
2. Write a program to create a new branch in Git, switch to it, and merge it with the main branch.
3. Write a program to install and configure Jenkins on a system.
4. Write a program to create a simple CI pipeline using Jenkins.
5. Write a program to automate the build process using Jenkins integrated with a Git repository.
6. Write a program to install Docker and verify its installation.
7. Write a program to create a Docker file for a simple application.
8. Write a program to build a Docker image and run a container from it.
9. Write a program to create a Kubernetes Pod using a YAML file.

10. Write a program to deploy an application in Kubernetes using a Deployment configuration.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work - 10 Marks
2. Algorithm, Program, Typing and Execution: 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	10	10
Typing and Execution	10	10

MAPPING

CO \ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	H	S
CO2	S	H	S	M	M
CO3	H	S	H	S	S
CO4	S	M	H	M	H
CO5	S	S	S	S	S
S – Strong H – High M – Medium L – Low					

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper:	Core Paper 9 - Computer Networks			
Batch 2026-2027	Hours Week 5	Total Hours 75	Credits 4	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. Understand computer networks, hardware, software, and standardization.
2. Explore wireless transmission technologies and their applications.
3. Analyze data link layer design, error handling, and MAC protocols.

Course Outcomes (CO)

K1 to K5	CO1	Explain the fundamental concepts of computer networks, network hardware, software, and standardization models.
	CO2	Describe wireless communication technologies, including mobile networks, telephone systems, and satellite communication.
	CO3	Analyze data link layer design issues, error detection and correction techniques, and multiple access protocols.
	CO4	Compare different network layer protocols, routing algorithms, and congestion control methods.
	CO5	Evaluate transport layer services, security mechanisms, and application layer protocols such as HTTP, DNS, and email.

Syllabus

UNIT I

(14 Hours)

Introduction: Uses of Computer networks – Network Hardware - Network Software - Reference Models: The OSI Reference Models- The TCP/IP Reference Model-Example Networks: The Internet- Third – Generation Mobile Phone Networks- Wireless Lans:802.11- Network Standardization- Metric Units.

UNIT II**(15 Hours)**

Introduction to Wireless Transmission - Functions - Advantages of wireless communication - Communication Satellites – Telephone System: Structure - Local Loop - Trunks and Multiplexing and Switching-Cable Television.

UNIT III**(15 Hours)**

Data Link Layers Design Issues: Services Provided to the Network Layer – Framing– Error Detection and Correction: Error Correcting Codes- Error Detecting Codes- Elementary Data Link Protocols-Sliding Window Protocols-Data Link Layer in the Internet - Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols – An overview of IEEE Standard for LANs - MAC Address - Bluetooth.

UNIT IV**(15 Hours)**

Network layer: Network layer Design Issues: Store-and-forward Packet Switching – Services Provided to the Transport Layer-Implementation of Connectionless Service- Comparison of Virtual -Circuit and Datagram Networks- Routing Algorithms-Congestion control algorithms - Network Protocols - IP- IPV4 - IPV6 - Subnets - Gateways- Congestion Avoidance in Network Layer.

UNIT V**(16 Hours)**

Transport Layer - Services - Connection Management - Addressing - Establishing and Releasing a Connection – Simple Transport Protocol – Internet Transport Protocols (ITP) - Network Security - Cryptography - Principles of Network Applications - Web and HTTP - Electronic mail* - DNS.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Book:

Andrew S. Tanenbaum, (2018), “Computer Networks”, Fourth Edition - Pearson Education Publication.

Reference Books:

1. Kurose, J. F., & Ross, K. W., 2021, Computer Networking: A Top-Down Approach, 8th Edition, Pearson, Boston.
2. Behrouz A. Forouzan, (2013), “Data Communications and Network”, Second Edition, Tata McGraw Hill.
3. William A Shay, (2001), “Understanding data communications and Networks”, Second Edition - Vikas Publication.

Web References:

1. [https://www.coursera.org/courses?query=computer +networks](https://www.coursera.org/courses?query=computer+networks)
2. <https://www.javatpoint.com/computer-network-tutorial>
3. <https://www.geeksforgeeks.org/computer-network-tutorials/>

MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	M	S	H	H	S
CO4	S	M	S	M	H
CO5	S	S	M	H	S

S – Strong

H – High

M – Medium

L – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:10		Bachelor of Computer Applications		
Title of the Paper		Project and Viva Voce		
Batch 2026-2027	Hours/Week 4	Total Hours 60	Credits 5	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. Acquire skills to select tasks based on course knowledge.
2. Develop analytical skills for task-solving.
3. Gain confidence by implementing tasks in real projects.

Course Outcomes (CO)

K3 to K5	CO1	Apply the programming skills for solving the project.
	CO2	Analyze the task and to collect the necessary information about the software.
	CO3	Evaluate the task based on the software.
	CO4	Test the project for its successful implementation
	CO5	Implement and Maintain the developed system.

Students undertake a project in the sixth semester of the course Programme. The project focuses on applying Computer Science concepts to develop a practical software solution for a real-world problem. It enhances students' technical, analytical, and programming skills while providing hands-on experience in software development and implementation. Students document their work in a project report and present their findings through a viva voce examination at the end of the semester.

Guidelines to the Distribution of Marks:

Knowledge Level	Particulars		Marks	Total
K3	CIA	Review	15	20
		Regularity	05	
	ESE	Project report *	60	80
		Viva –Voce *	20	

MAPPING

CO \ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	H	S
CO2	S	M	M	H	H
CO3	S	H	S	H	H
CO4	S	S	S	S	S
CO5	S	S	S	H	H

S -Strong

H – High

M – Medium

L – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

ELECTIVE PAPERS

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Programme code:10	Bachelor of Computer Applications			
Title of the Paper:	Major Elective – Big Data and Analytics			
Batch 2026- 2027	Hours/Week 5	Total Hours 75	Credits 5	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To Grasp Big Data fundamentals, key concepts, and adoption drivers.
2. To Analyze security, privacy, governance, and lifecycle in Big Data.
3. To Study NoSQL databases and distributed file storage.

Course Outcomes (CO)

K1 to K5	CO1	Identify the need for Big Data analysis.
	CO2	Develop ability to analyze and process Big Data.
	CO3	Build necessary skills to process Big Data by identifying the use case.
	CO4	Acquire knowledge about Hadoop Ecosystem.
	CO5	Disseminate the new knowledge and implementing to the organization.

Syllabus

UNIT I

(14 Hours)

Understanding Big Data: Introduction – Concepts and Terminology – Big Data Characteristics -Different types of Data. Business Motivation and Drivers for Big Data Adoption: Marketplace Dynamics – Business Architecture – Business Process management – Information and Communications Technology– Internet ofEverything (IoE).

UNIT II

(16 Hours)

Big Data Adoption and Planning Considerations: Organization Prerequisites - Data Procurement Privacy - Security - Provenance - Limited Real-time Support - Distinct Performance Challenges - Distinct Governance Requirements - Distinct Methodology – Clouds Big Data Analytics Lifecycle. **Enterprise Technologies and Big Data Business Intelligence:** Online Transaction Processing (OLTP) - Online Analytical Processing (OLAP) -Extract Transform Load (ETL) – Data Warehouses- Data Marts - Traditional BI - Ad-hoc Reports - Dashboards - Big Data BI- Traditional Data Visualization - Data Visualization for Big Data.

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UNIT III

(15 Hours)

Storing and Analyzing Big Data: Big Data Storage Concepts-Clusters-File Systems and Distributed File Systems - NoSQL – Sharding – Replication - Master-Slave - Peer-to-Peer - Sharding and Replication - Combining Sharding and Master-Slave Replication - Combining Sharding and Peer-to- Peer Replication - CAP Theorem - ACID – BASE. **Big Data Processing Concepts:** Parallel Data Processing - Distributed Data Processing - Hadoop - Processing Workloads - Batch - Transactional –Cluster.

UNIT IV

(15 Hours)

Processing in Batch Mode - Batch Processing with Map Reduce - Map and Reduce Tasks - Map - Combine - Partition - Shuffle and Sort- Reduce - A Simple Map Reduce Example - Understanding MapReduce Algorithms- Processing in Real time Mode -Speed Consistency Volume(SCV) - Event Stream Processing-Complex Event Processing –Realtime BigData Processing and SCV–Realtime Big Data Processing and Map Reduce. **Big Data Storage Technology:** On-Disk Storage Devices - Distributed File Systems - RDBMS Databases - NoSQL Databases – Characteristics- Rationale – Types - Key-Value - Document- Column-Family - Graph- NewSQL Databases.

UNIT V

(15 Hours)

In Memory Storage Devices-In-Memory Data Grids-Read-through-Write-through-Write-behind Refresh-ahead- In-Memory Databases. **Big Data Analysis Techniques:** Quantitative Analysis - Qualitative Analysis - Data Mining - Statistical Analysis - A/B Testing - Correlation - Regression -Machine Learning- Classification (Supervised Machine Learning- Clustering (Unsupervised Machine Learning)* - Outlier Detection – Filtering - Semantic Analysis – Natural Language Processing - Text Analytics- Sentiment Analysis – Visual Analysis - Heat Maps- Time Series Plots- Network Graphs-Spatial Data Mapping.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Book:

1. Thomas Erl,. Wajid Khattak, and Paul Buhler, “Big Data Fundamentals. Concepts, Drivers & Techniques” Pearson Publications,2016.

Reference Books:

1. Seema Acharya and Subhashini C,(2015),“Big Data and Analytics”, Wiley Publication.
2. Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman,(2013),“Bigdata for dummies Wiley Publication
3. Tom White,(2015),“Hadoop: The Definitive Guide”,O’Reilly Publication.

Web References:

1. https://www.tutorialspoint.com/big_data/index.html
2. <https://www.w3schools.com/datascience/>
3. <https://www.cloudera.com/services-and-support/training.html>

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MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	M	H	S	S
CO2	M	H	M	S	M
CO3	S	H	M	H	M
CO4	S	M	H	M	S
CO5	H	S	S	S	H

S– Strong

H – High

M–Medium

L –Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

UCA 63

Programme code:10	Bachelor of Computer Applications			
Title of the Paper:	Major Elective – Data Mining and Warehousing			
Batch 2026 – 2027	Hours/Week 5	Total Hours 75	Credits 5	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To learn the basic concepts of Data Mining algorithms, methods and tools.
2. To develop and apply critical thinking, problem-solving, and decision-making skills.
3. To discover interesting patterns, analyze supervised and unsupervised models and estimate the accuracy of the algorithms.

Course Outcomes (CO)

K1 to K5	CO1	Knowing the data mining principles and techniques.
	CO2	Understanding the concept of raw data processing using data mining algorithms.
	CO3	Learning data mining algorithms to build analytical applications.
	CO4	Gaining information's to extract patterns and to solve problems.
	CO5	To develop the ability to communicate the findings from data analysis, including noise and redundancy management.

Syllabus**UNIT I****(15 Hours)**

Expanding Universe of Data- Production Factor-Data Mining-Data Mining versus Query Tools-Data Mining in Marketing-Practical Applications. Learning – Self Learning Computer Systems- Machine Learning and Methodology of Science – Concept Learning.

UNIT II**(15 Hours)**

Data Warehouse-Need- Designing Decision Support System-Integration with Data Mining – Client Server and Data Ware Housing – Multi Processing Machines- Cost Justification- Knowledge Discovery Process – Data Selection – Cleaning – Enrichment- Coding.

UNIT III

(15 Hours)

Data Mining – Preliminary Analysis of the Data Set Using Relational Query Tools – Visualization Techniques – Likelihood and Distance – OLAP Tools – K –Nearest Neighbor– Decision Tree- Association Rule – Neural Networks – Reporting- Different Forms of Knowledge- Ten Golden Rules.

UNIT IV

(15 Hours)

Developing a data warehouse: Why and how to build a data warehouse? Data warehouse architectural strategies and organizational issues- Design considerations- Data content – *Metadata- Distribution of data- Tools for data warehousing- Performance considerations- crucial decisions in designing a data warehouse- Applications of data warehousing and data mining in government.

UNIT V

(15 Hours)

Customer Profiling – Predicting Bit Behavior of Pilots – Learning as Compression of Data Sets- Content of Message – Noise and Redundancy – Significance of Noise – Fussy Data Base- The Traditional theory of Relational Database – From Relations to Tables – From Keys to Statistical Development Dependencies – Denormalization – Data Mining Primitives.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Books:

1. C. S. R. Prabhu, (2002), “Data Warehousing-concepts, techniques, products and Applications”, Second Edition, Prentice Hall of India private limited, New Delhi, (Unit-IV)
2. Pieter Adriaans, Dolf Zantinge (2001), “Data Mining “, Addison Wesley, (Unit I, II, III &V)

Reference Books:

1. Kamthania Deepali (2022), Data Warehousing and Data Mining, First Edition, Tech Sar private limited
2. Margaret H. Dunham, (2003), “Data Mining – Introductory and Advanced Topics”, Pearson Education

Web References:

1. <https://learn.microsoft.com/en-us/azure/architecture/data-guide/relational-data/online-analytical-processing>
2. <https://www.javatpoint.com/data-mining?>
3. <https://www.analyticsvidhya.com/blog/category/data-mining/?>

MAPPING

CO \ PSO	PSO 1	PSO 2	PSO3	PSO 4	PSO 5
CO1	S	H	S	S	S
CO2	S	H	S	H	M
CO3	S	H	M	S	H
CO4	S	M	S	M	H
CO5	S	H	S	H	M

S– Strong

H – High

M–Medium

L –Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

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Programme code:10	Bachelor of Computer Applications			
Title of the Paper:	Major Elective– Cloud Computing			
Batch 2026 – 2027	Hours/Week 5	Total Hours 75	Credits 5	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. Understand the fundamental principles of cloud computing and its various models.
2. Explore cloud architectures, including the components and delivery models.
3. Gain practical knowledge of cloud storage solutions and their applications.

Course Outcomes (CO)

K1 to K5	CO1	Understand the fundamental concepts of cloud computing, including types and working models.
	CO2	Understand cloud computing architectures, cloud modeling, and the role of virtualization.
	CO3	Understand data storage concepts, cloud storage solutions, and cloud services.
	CO4	Analyze security risks in cloud computing and apply cloud security measures.
	CO5	Understand cloud migration, cloud applications, and the services provided by Microsoft, Google, and Amazon.

Syllabus

UNIT I

(15 Hours)

Introduction : Definitions – Business Drivers – Technology Innovations – Basic Concepts and Terminology: Cloud – IT Resource – On-Premise –Cloud Consumers and Cloud Providers – Scaling –Cloud Service – Cloud Service Consumer– Goals and Benefits –Risk and Challenges. Fundamentals concepts and Models Roles and Boundaries – Cloud Characteristics – Cloud Delivery Models: Infrastructure-as-a-Service - Platform-as-a-Service – Software-as-a-Service – Cloud Deployment Models: Public Clouds – Community Clouds – Private Clouds – Hybrid Clouds – Other Cloud Deployment Models.

UNIT II**(15 Hours)**

Broadband Networks and Internet Architecture: Internet Service Provider – Connectionless Packet Switching – Router Based Interconnectivity – Data Center Technology - Virtualization Technology – Web Technology – Multitenant Technology – Service Technology.

UNIT III**(15 Hours)**

Fundamental Cloud Architecture : Workload Distribution Architecture – Resource Pooling Architecture – Dynamic Scalability Architecture – Elastic Resource Capacity Architecture – Service Load Balancing Architecture – Cloud Bursting Architecture – Elastic Disk Provisioning Architecture – Redundant Storage Architecture – Case Study Examples.

UNIT IV**(15 Hours)**

Load Balanced Virtual Server Instances Architecture – Zero Downtime Architecture – Dynamic Failure Detection and Recovery Architecture – Fundamental Cloud Security: Cloud Security Threats.

UNIT V**(15 Hours)**

Cloud Platforms in Industry: Amazon Web Services –Google AppEngine – Cloud Applications: Scientific Applications – Healthcare: ECG Analysis in Cloud – Biology: Protein Structure Prediction – Business & Consumer Applications: CRM &ERP, Social Networking*.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Book:

1. Thomas Erl, Zaigham Mahmood and Ricardo Puttini, 2019, “Cloud Computing Concepts, Technology & Architecture”, Pearson India Education Services Pvt. Ltd, Twelfth Impression. (Unit I –IV)

2. Rajkumar Buyya, Christian Vecchiola and S.ThamaraiSelvi, 2018, “Mastering Cloud Computing”, McGraw Hill Education(India) Pvt. Ltd, Thirteenth reprint. (Unit V)

Reference Books:

1. Kumar Saurabh, 2011, “Cloud Computing – Insights into New Era Infrastructure”, Wiley Indian Edition.
2. Kaittwang Geoffrey C.Fox and Jack J Dongrra, 2012, “Distributed and Cloud Computing”, Elsevier.

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3. You Work and Collaborate Online”, Que Publishing.
4. Michael Miller, 2008, “Cloud Computing: Web-Based Applications That Change the Way

Web References:

1. <https://www.cloudskillsboost.google/>
2. <https://www.coursera.org/browse/information-technology/cloud-computing?>
3. <https://www.edx.org/learn/cloud-computing?>

MAPPING

CO \ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	S	M	M	M
CO2	S	H	M	M	M
CO3	M	M	H	S	M
CO4	M	M	S	H	S
CO5	M	M	M	S	H

S– Strong

H –High

M–Medium

L–Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

UCA 69

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper:	Major Elective - Internet of Things			
Batch 2026-2027	Hours/Week 5	Total Hours 75	Credits 5	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. To learn the concepts of IOT and its protocols.
2. To Learn IEEE standards.
3. To learn how to analysis the data in IOT.

Course Outcomes (CO)

K1 to K5	CO1	Analyzing and evaluate the data received through sensors in IOT.
	CO2	Design and develop smart city in IoT
	CO3	Analyze various communication protocols for IoT.
	CO4	Analyze applications of IoT in real time scenario
	CO5	Evaluate appropriate protocol for communication between IoT.

UNIT I**(14Hours)**

Introduction to IoT-Genesis of IoT-IoT and Digitization-IoT Impact-Convergence of IT and OT-IoT Challenges- **Comparing IoT Architectures**: oneM2M, IoT World Forum (IoTWF - Additional IoT Reference Models. – Sensors, Actuators, Smart Objects.

UNIT II**(15 Hours)**

IoT Protocols: IoT Access Technologies: Physical and MAC layers topology and Security of IEEE 802.15.4, 802.15.4g and LoRaWAN **Application Layer Protocols**: CoAP and MQTT.

UNIT III**(16 Hours)**

Design and Development: Design Methodology- Embedded computing logic- Microcontroller, System on Chips- IoT system building blocks- Arduino- Board details, IDE programming- Raspberry Pi - introduction.

UNIT IV

(16 Hours)

Data Analytics for IoT: Structured Vs Unstructured Data and Data in Motion Vs Data in Rest– Role of Machine Learning–No SQL Databases– Hadoop Ecosystem– Python Web Application Framework.

UNIT V

(14 Hours)

Case Studies/Industrial Applications: Cisco IoT system - IBM Watson IoT platform– Manufacturing–Home Automation, Smart Agriculture - *Smart Parking Architecture and Smart Traffic Control system.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Books

David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry (2017), IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press.

Reference Books

1. Arshdeep Bahga, Vijay Madisetti (2015), “Internet of Things – A hands-on approach”, Universities Press.
2. Olivier Hersent, David Boswarthick, Omar Elloumi (2012), —The Internet of Things – Key applications and Protocols, Wiley.
3. Honbo Zhou (2012), “The Internet of Things in the Cloud: A Middleware Perspective”, CRC Press.

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MAPPING

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S
CO2	S	S	H	H	S
CO3	H	H	S	M	H
CO4	S	H	M	S	H
CO5	H	S	S	H	M

S–Strong

H–High

M–Medium

L –Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

UCA 72

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper:	Major Elective – Quantum Computing			
Batch 2026-2027	Hours / Week 5	Total Hours 75	Credits 5	Employability/ Skill Development/ Entrepreneurship

Course Objectives

1. Understand the fundamental principles of quantum computing and its advantages over classical computing.
2. Explore the theoretical and practical aspects of quantum machine learning algorithms.
3. Develop the ability to implement quantum neural networks and variational quantum circuits.

Course Outcomes (CO)

K1 to K5	CO1	Understand the basics of quantum computing and quantum algorithms.
	CO2	Learn fundamental machine learning concepts and neural networks.
	CO3	Understand quantum machine learning techniques and models.
	CO4	Apply quantum computing methods in image and signal processing.
	CO5	Explore applications, challenges, and future trends in quantum computing and AI.

Syllabus**UNIT I (15 Hours)**

Introduction to Quantum Computing: Classical vs. Quantum Computing, Qubits, Superposition, Entanglement, Quantum Gates, Quantum Measurement, Basic Quantum Algorithms.

UNIT II (15 Hours)

Fundamentals of Machine Learning: Supervised & Unsupervised Learning, Neural Networks, Optimization, Bias-Variance Tradeoff, Model

UNIT III (15 Hours)

Quantum Machine Learning: Quantum Data Encoding, Variational Quantum Circuits (VQCs), Quantum Kernel Methods, Quantum Neural Networks, Quantum GANs

UNIT IV**(15 Hours)**

Quantum Image and Signal Processing: Quantum Image Representation, Quantum Fourier Transform, Quantum Edge Detection, Quantum Image Compression

UNIT V

Applications and Future Trends in Quantum Computing: Quantum Reinforcement Learning, Quantum Optimization, AI in Finance & Cryptography*, Challenges & Future Research Directions.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Book:

“QUANTUM COMPUTING FOR EVERYONE”, THE MIT PRESS, 2019.

Reference books:

1. Quantum Computing for the Quantum Curious, Ciaran Hughes, Joshua Isaacson, Anastasia Perry, Ranbel F. Sun, Jessica Turner, 2022
2. “An Introduction to Quantum Computing”, Phillip Kaye, Raymond Laflamme and Michele Mosca, Oxford University Press, 2007

Web References:

1. <https://www.ibm.com/think/topics/quantum-computing>
2. <https://aws.amazon.com/what-is/quantum-computing/>
3. <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-quantum-computing>
4. <https://learn.microsoft.com/en-us/azure/quantum/overview-understanding-quantum-computing>

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MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	M	S	H	H	S
CO4	S	M	S	M	H
CO5	S	S	M	H	S

S – Strong**H** – High**M** – Medium**L** – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

UCA 75

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	Major Elective - Software Project Management			
Batch 2026-2027	Hours/Week 5	Total Hours 75	Credits 5	Employability / Skill Development/ Entrepreneurship

Course Objectives

1. Understand the core principles of Software Project Management.
2. Learn various methods and techniques used in project management.
3. Perform scheduling, tracking, risk analysis, quality management, and cost estimation using appropriate techniques.

Course Outcomes (CO)

K1 TO K5	CO1	Understand the fundamentals of Software Project Management, including its phases and various life cycle models.
	CO2	Apply project planning techniques such as scheduling, tracking, risk management, and cost estimation.
	CO3	Evaluate software quality standards, the role of SQA, and associated tools and challenges.
	CO4	Analyze software requirements, estimation techniques, and the challenges of requirements management.
	CO5	Manage software maintenance activities, including configuration management and performance metrics.

Syllabus**UNIT I****(15 Hours)**

Product Life Cycle: Introduction – Idea generation – Prototype development Phase –Alpha phase – Beta phase – Production phase – Maintenance and obsolescence Phase. **Project Life Cycle models:** What is Project Life Cycle Model? -A Framework for studying different life cycle

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models – The Waterfall model*– The prototyping model – RAD model – The Spiral model and its variants.

UNIT II

(15 Hours)

Software Quality Assurance: How do you define quality? -Why is quality important in software? – Quality Control and Quality Assurance – Cost and benefits of quality – Software quality analyst's functions– Some popular misconceptions about the SQA's role-Software quality assurance tools –Organizational structures – Profile of a successful SQA.

UNIT III

(15 Hours)

Software requirements gathering: Dimensions of requirements gathering –Steps to be followed during requirements gathering –Outputs and quality records from the requirements phase – Skills sets required during the requirements phase-Challenges during the requirements management phase- Metrics for the requirements phase.

UNIT IV

(15 Hours)

Design and development phase: Salient features of design – Design for reusability – Technology choices /constraints – Design to standards – Design for portability – User interface issues –Challenges during design and development phases-Skill sets for design and development- Metrics for design and development phases.

UNIT V

(15 Hours)

Project Management in the Maintenance Phase: Introduction – Activities during the maintenance phase-Management issues during the maintenance phase- Configuration management during the maintenance phase – Skill sets for people in the Maintenance phase - Metrics for the Maintenance phase.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Text Books:

1. Gobalswamy Ramesh,(2007), “Managing Global Software Projects”, Tata McGraw Hill Publishing Company.
2. Dutt, Chandramouli, “Software Project Management” Pearson India, 2015

Reference Books:

- 1.S.A. Kelkar, (2003),“Software Project Management – A Concise study”, PHI.
2. Milk Cotterel, Bob Hughes, (1955), “Software project Management”, Inclination/Thomas Computer press.
3. Derrel Ince, H. Sharp and M. Woodman, (1995), “Introduction to software project management and quality assurance”, Tata McGraw Hill.
4. Stephen H. Kan, “Metricies and Models in Software Quality Engineering”, Second Edition, Pearson Education Asia.

Web References:

1. <https://github.com/quantumlib/Cirq?>
2. <https://www.quantum-inspire.com/>
3. <https://github.com/microsoft/QuantumKatas>

MAPPING

CO \ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	M	S	S
CO2	S	S	H	H	H
CO3	H	H	S	H	M
CO4	S	M	H	S	S
CO5	M	S	M	H	H

S – Strong**H – High****M – Medium****L – Low**

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code: -	For B.A., BBA CA, B. Com, BCA and B.Sc., Degree Students				
Title of the Paper	Skill Based Subject 1 – Basics of Cyber Security				
Batch 2026-2027	Semester III	Hours/ Week 2	Total Hours 30	Credits 3	Skill Development

Course Objectives

1. To provide fundamental knowledge of cyber security concepts and the digital environment.
2. To create awareness about cyber threats, cybercrimes, and common online frauds.
3. To develop the ability to identify risks associated with internet, mobile, and online transactions.
4. To familiarize students with safe practices in email, social media, and digital communication.
5. To introduce basic cyber laws, ethics, and responsible digital behavior.

Course Outcomes (CO)

K1 to K5	CO1	Apply the fundamental concepts of cyber security and digital safety at appropriate place.
	CO2	Identify various cyber threats, cybercrimes, and online frauds.
	CO3	Enable safe practices while using internet, mobile, and e-commerce platforms.
	CO4	Interpret security issues related to email and social media usage.
	CO5	Comprehend cyber laws, ethics, and legal responses to cybercrime.

Syllabus

UNIT I

(6 Hours)

Foundations of Cyber Security: Cyberspace and Digital Environment -Evolution of Cyber Security- Basic Concepts and terminology in Cybersecurity –Cybersecurity Threat – Defense in Depth concept in Cyber Security- Information Literacy – Types of False Information — Digital footprint — Cyber Frauds- Basic Safety Practices and Password Awareness - Multi-Factor Authentication (MFA)- Zero Trust Security Model.

UNIT II

(6 Hours)

Cyber Crimes & Threat Landscape: Introduction to AI in Cyber Security- Cyber Crimes- Important of Cybercrime- Types of Cyber Crime - CIA Triad – Tools for Confidentiality, Integrity, Availability -Cyber Crime & Digital Evidence Indian Perspective- Recent Cyber Crime Incidents-Social Engineering Frauds- Financial Frauds using Social Media Platforms- Ransomware Attacks -Deep fake based frauds -Cryptocurrency scams -Dark Web basics - Preventive Measures for individuals and Organizations – Awareness and Safe Online Behavior- Incident Response Process

UNIT III**(6 Hours)**

Internet, Mobile & Digital Transaction Security: Browser Security Tools – Mobile phone security and privacy settings – E-commerce concepts and risks – UPI Fraud Awareness -QR Code Scams - App permissions & Data Tracking – Malware Types and Cyber Attacks- Secure browsing and Data Theft & Public Wi-Fi Precautions – Symmetric vs Asymmetric Encryption.

UNIT IV**(6 Hours)**

Communication & Social Media Security: Basics of email usage and Communication – Email threats: Spam, Phishing, Malicious links- Fake News – Fake profiles, Cyber Bullying and Data Misuse –Computer Viruses – Antivirus and Firewall concepts – Safe sharing practices and Digital responsibility. Ethical Hacking.

UNIT V**(6 Hours)**

Cyber Laws, Ethics & Digital Responsibility: Introduction to Cyber Law – IT Act 2000 and Amendments– Data Protection Laws (India DPDP Act 2023). Intellectual Property in Digital Space- Cybercrime and legal provisions – User rights and responsibilities in cyberspace – Digital footprint and online identity – Personal data protection and privacy – Cyber ethics and responsible usage – Cyber safety awareness programs and best practices.

Case Study: Case studies of cyber law enforcement in India

Teaching Methods

Chalk and Talk, Presentation, Seminar, Quiz, Discussion & Assignment

Work Book

1. *Basics of Cyber Security*, prepared by Kongunadu Arts and Science College, Coimbatore

Reference Books

1. Data Security Council of India (DSCI), in collaboration with Seqrite, presents the second edition of the India Cyber, Threat Report 2025.
2. Green, J., Smith, A., & Brown, T. (2024). Information security management principles. Routledge.
3. Armstrong-Smith, S. (2024). Understand the cyber attacker mindset: Build a strategic security program. Kogan Page.
4. Ismail, Y., Lacy, F., & Belu, R. (Eds.). (2024). Cybersecurity: Threats, technologies, and emerging solutions. IntechOpen

5. Rais, R., Morillo, C., Gilman, E., & Barth, D. (2023). Zero trust networks: Building secure systems in untrusted networks (2nd ed.). O'Reilly Media.
6. Shapiro, S. J. (2023). Fancy bear goes phishing: The dark history of the information age. Farrar, Straus and Giroux.
7. Tamil Nadu Fact Check Unit, Training Handbook
8. James Graham (2011), Cyber Security Essentials, CRC Press, Auerbach Publications, Taylor & Francis Group.
9. Kathryn Knerler (2022), 11 Strategies of a World-Class Cybersecurity Operations Center, MITRE Corporation.
10. Dr. Jeetendra Pande (2017), Introduction to Cyber Security, Uttarakhand Open University.
11. Rohas Nagpal (2008), Real world cyber crime cases, Cyber Crime & Digital Evidence – Indian Perspective, Asian School of Cyber Laws
12. Prof. (Dr.) Nilesh K. Modi (2021), Cyber Security Techniques, Dr. Babasaheb Ambedkar Open University.
13. Cyber Security Awareness Handbook (2020), Ciso Jil information Technology Limited.
14. Jeff Kosseff (2020), Cybersecurity Law, John Wiley & Sons, Inc.
15. Cyber Crime Law and Practice, The Institute of Company Secretaries of India, 2016
16. Yuri Diogenes (2018), Cybersecurity Attack and Defense Strategies, Packt Publishing.
17. Cybersecurity Handbook, Ministry of Digital Governance, National Cybersecurity Authority, June 2021.
18. Justin Hutchens (2024), The Language of Deception: Weaponizing Next Generation AI– Explores AI in social manipulation, deep fakes, and malware.
19. D.R. Halston (2025), Cyber Security Mastery Covers AI-driven attacks, cloud security, and career preparation.

Web References

1. <https://safety.google/>
2. <https://safety.google/security/security-tips/>
3. <https://www.simplilearn.com/tutorials/cyber-security-tutorial>
4. <https://www.getcybersmart.org/for-students>
5. <https://www.techbuddies.io/cyber-security-basics>
6. <https://www.geeksforgeeks.org/ethical-hacking/what-is-cyber-security/>
7. <https://www.drishtiiias.com/daily-updates/daily-news-editorials/india-s-cybersecurity-challenge-threats-and-strategies>
8. <https://www.dsci.in/resource/content/india-cyber-threat-report-2025>
9. <https://www.eimt.edu.eu/25-major-cyber-attacks-in-india-threats-and-strategies>
10. <https://www.coursera.org/in/articles/types-of-cyber-attacks>
11. <https://eventussecurity.com/cybersecurity/india/cyber-attacks/>
12. www.heimdalsecurity.com

UCA 81

CIA EXAMINATION MARK BREAKUP

The CIA Examination mark breakup for the course **Basics of IPR** is given below:

S.No.	Distribution Component	Marks
1	CIA I – 75 Marks Converted to 30	30
2	CIA II – 75 Marks Converted to 30	30
3	Seminar/Objective Capacity Testting	10
4	Seminar/Objective Capacity Testting	10
5	Attendance	05
6	Any Case Study related to IPR (as a Group)	15
	Total	100

QUESTION PAPER PATTERN

The following question paper pattern will be followed for the above said courses:

Section A - Multiple Choice (10 × 1 = 10 Marks)

Section B - Either or Type (5 × 5 = 25 Marks)

Section C - Either or Type (5 × 8 = 40 Marks)

Maximum Marks : 75

Duration : 3 Hours

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

**KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
COIMBATORE - 641029**

**THE MODALITIES FOR THE CONDUCT OF 100% CIA
EXAMINATIONS**

PREAMBLE

As per the recommendations of the Curriculum Development Cell in its meeting held on 27.08.2021, and decision taken in the General Board of Studies meeting held on 16.03.2022, the courses **Cyber Security and Information Security** were introduced in the III semester for all the UG programmes and in the even semester for the PG programme respectively for the students admitted from the academic year 2022-2023 and onwards. Also, it was unanimously decided to conduct 100 % CIA examinations (No End of Semester Examinations) for these courses. The name of the Courses Cyber Security and Information Security are renamed as **Basics of Cyber Security and Fundamentals of Information Security** as per the decision taken in the General Board of Studies meeting held on 26.03.2026 for the students to be admitted from the academic year 2026-2027 & onwards. As per the recommendations of the Curriculum Development Cell in its meeting held on 07.03.2022, it was approved in the BOS meeting held on 19.03.2022 to conduct 100% CIA Examinations for the **Extra Departmental Courses** offered in the UG and PG Programmes for the students admitted from the academic year 2022-2023 and onwards. The cited decisions had been approved by the Academic council in its meeting held on 18.04.2022. As per the recommendations of the Curriculum Development Cell in its meeting held on 27.02.2024, and decision taken in the General Board of Studies meeting held on 02.05.2024, the course **Basics of IPR** was introduced in the VI semester for all the UG programmes for the students admitted from the academic year 2024-2025 and onwards and decided to conduct 100 % CIA examinations (NO End of Semester Examinations) for the course.

Hence, the modalities is recommended for the following:

- (i) Conduct of I & II CIA Examinations
- (ii) Question Paper Pattern
- (iii) CIA Examination Mark Breakup
- (iv) Attendance Calculation

CONDUCT OF I & II CIA EXAMINATIONS

1. The CIA Examinations I & II for the above said courses must be conducted along with the other courses under centralized system.
2. The students must appear I & II CIA Examinations compulsorily, since **End of Semester Examinations will NOT be conducted** for the above said courses.
3. If any of the student (s) could not appear for CIA Examinations for the above said courses, with reasons mentioned in the College Calendar, re-examination shall be conducted as per the existing procedures.

QUESTION PAPER PATTERN

The following question paper pattern will be followed for the above said courses:

Section A - Multiple Choice	(10 × 1 = 10 Marks)
Section B - Either or Type	(5 × 5 = 25 Marks)
Section C - Either or Type	(5 × 8 = 40 Marks)

Maximum Marks : 75

Duration : 3 Hours

CIA EXAMINATION MARK BREAKUP

The CIA Examination mark breakup for the courses **Basics of Cyber Security, Fundamentals of Information Security and Basics of IPR** is given below:

S.No.	Distribution Component	Marks
1	CIA I – 75 Marks Converted to 30	30
2	CIA II – 75 Marks Converted to 30	30
3	Seminar/Objective Capacity Testing	10
4	Seminar/Objective Capacity Testing	10
5	Attendance	05
6	Any Case Study related to Cyber Security (as a Group)	15
	Total	100

The CIA Examination mark breakup for the **Extra Departmental Courses** offered for UG/PG Programmes is given below:

S.No.	Distribution Component	Marks
1	CIA I – 75 Marks Converted to 40	40
2	CIA II – 75 Marks Converted to 40	40
3	Seminar/Objective Capacity Testing	05
4	Seminar/Objective Capacity Testing	05
5	Attendance	05
6	Others (Group Discussion, Flipped Class room, etc.,)	05
	Total	100

ATTENDANCE CALCULATION

1. Separate attendance register must be maintained for **Basics of Cyber Security, Fundamentals of Information Security and Basics of IPR** in the Department and the final consolidated Attendance must be submitted to the COE along with the assessment Marks.
2. The attendance must be calculated by using the following formula:
$$\text{Attendance percentage} = \frac{\text{Number of Classes attended}}{\text{Number of Classes conducted}} \times 100$$
3. The students should be allowed to write the CIA examinations as per the existing norms related to attendance. The staff in charge of the respective courses have the responsibility to calculate the attendance percentage and submit the same to the Coordinator of the CIA Examination Committee during the I CIA and II CIA Examinations.
4. If the staff in charge finds that students have not put up enough attendance during the I CIA Examinations, he/she shall counsel the student(s) appropriately so that at the end of the course they have sufficient Attendance.




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**KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
COIMBATORE – 641029**

**MODALITIES FOR THE CONDUCT OF OPEN BOOK EXAMINATION
SYSTEM FOR THE COURSES BASICS OF CYBER SECURITY AND
FUNDAMENTALS OF INFORMATION SECURITY FOR ALL UG AND
PG PROGRAMMES RESPECTIVELY**

PREAMBLE

The Curriculum Development Cell (CDC) meeting was convened on 16.10.2025 and recommended to implement an open book examination system for the courses, Basics of Cyber Security and Fundamentals Information Security for all UG and PG programmes to improvise conceptual understanding skills, promote deep learning, enhance assessment quality and strengthen comprehensive skills, for the students to be admitted from the academic year 2026-2027 and onwards.

1.Purpose

To provide guidelines for conducting open book examinations that encourage critical thinking, application of knowledge, and analytical skills.

2.Scope

Applicable to Basics of Cyber Security and Fundamentals of Information Security courses for the undergraduate and postgraduate programmes respectively.

3. Examination Guidelines

Question Paper Design

- ❖ Questions should be Focused on higher-order thinking (analysis & evaluation)
- ❖ Avoid direct recall questions

Communication to Students and Staff Members

- ❖ Inform students in advance about the format, rules, and allowed resources.

- ❖ Provide sample questions to familiarize them with the OBE style.
- ❖ All the Staff members should be familiar about the prescribed Books of the Basics of Cyber Security and Fundamentals of Information Security.
- ❖ Students are permitted to carry the prescribed Books (in original or xerox copy) duly signed by the respective staff in charge of courses to the examination Hall.
- ❖ Invigilators of the respective examination halls should permit the students with the prescribed book (in original or xerox copy) and not to allow the students with other than the prescribed Books.




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Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	Skill Based Subject 2 – Linux Programming Lab			
Batch 2026-2027	Hours/ Week 2	Total Hours 30	Credits 3	Employability/ Skill Development

Course Objectives

1. To gain knowledge about the usage of shell scripting.
2. To teach the concepts of using arithmetic operations and looping.
3. To impart knowledge about the creation of files and directories.

Course Outcomes (CO)

K3 to K5	CO1	Applying the concepts of control structures in programming.
	CO2	Implementing the concepts of file operations in programming
	CO3	Analyzing the concept of dialog utilities in shell programming.
	CO4	Develop solutions for mathematical concept and propose appropriate result.
	CO5	Evaluate the programming techniques and tools to design computer programs.

LIST OF PRACTICAL PROGRAMS

1. Write a shell program to display your address.
2. To perform arithmetic operations using shell arithmetic.
3. Print the different patterns using looping operations.
4. To perform simple inventory control operation using read statement.
5. To prepare the student mark statement using necessary controls.
6. Sort the given numbers in both ascending and descending orders.
7. Write a shell program to perform user defined function concept.
8. Write a shell program using dialog utility concept.
9. Write a program to perform file operation.
10. Write a shell script to print 'Hello Linux' message in Bold, Blink and different colors.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student(3Hours/60Marks)

1. Record Work-10Marks
2. Algorithm, Program, Typing and Execution: 45Marks.

Particulars	Program I(Marks)	Program II(Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

MAPPING

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	H	S
CO2	H	S	S	S	H
CO3	S	H	S	H	H
CO4	S	M	S	S	H
CO5	S	S	S	H	S

S– Strong

H – High

M–Medium

L –Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code	For B.A., BBA CA, B. Com, BCA and B.Sc., Degree Students				
Title of the Paper	Skill Based Subject - 3 - Basics of Intellectual Property Right's				
Batch 2026-2027	Semester VI	Hours/Week 2	Total Hours 30	Credits 3	Skill Development

Course Objectives

1. To create awareness about recent trends in IPR and Innovation
2. To explore the basic concepts IPR
3. To focus upon trademarks, copyrights, patents, industrial designs and traditional knowledge.
4. To learn more about managing IP rights and legal aspects.

Course Outcomes

On successful completion of the course, the students will be able to

K1 ↑ ↓ K5	CO1	Know about basic concepts of IPR and patent
	CO2	Understand copyrights, industrial designs and geographical indication of goods.
	CO3	Differentiate between trademarks and trade secrets
	CO4	Acquire knowledge on protection of traditional knowledge and plant varieties.
	CO5	Manage and protect IP Rights

Syllabus

Unit – I

(6 hours)

Introduction -origin and development of Intellectual Property Rights (IPR), need for protecting IP, **Patents:** Foundation of patent law, patent searching process, basic criteria of patentability. Patentable and non - patentable subject matters in India. Patent prior art search, drafting the patent specification and filing procedure

Unit – II

(6 hours)

Copyrights: Fundamentals of copyright law, originality of material, right of reproduction, right to perform the work publicly, copyright ownership issues, notice of copyright. **Industrial**

Designs: Kind of protection provided in Industrial design. **Geographical Indication of Goods:** Basic aspects and need for the registration.

Unit – III**(6 hours)**

Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, transfer of rights, selecting and evaluating trademark, registration of trademarks, claims. **Trade Secrets:** Trade secret law, determination of trade secret status, liability form is appropriation of trade secrets, trade secret litigation.

Unit – IV**(6 hours)**

Protection of traditional knowledge - Objectives, concept of traditional knowledge, issues concerning, bioprospecting and biopiracy. **Protection of Plant Varieties** - Objectives, international position, plant varieties protection in India. Rights of farmers, breeders and researchers.

Unit- V**(6 hours)**

Managing IP Rights: Acquiring IP Rights: letters of instruction, joint collaboration agreement, protecting IP Rights: non-disclosure agreement, cease and desist letter, settlement memorandum. **Transferring IP Rights:** Assignment contract, license agreement, deed of assignment. Infringement and enforcement.

Text Books

1. Ramakrishna Chinta kunta and M. Geethavani (2022). A Textbook of Intellectual Property Rights. Blue Hills publications.
2. N.K Acharya (2021), Intellectual property rights(8thEdn). Asia Law House.
3. Craig Allen Nard, Michael J. Madison, and Mark P. McKenna. (2017). Law of Intellectual Property (5thEdn). New York Aspen publishers.
4. Barrett and Margreth (2009). Intellectual Property. New York Aspen publishers.
5. Deborah E.Bouchoux(2013). Intellectual property: The Law of Trademarks, Copyrights, Patents, and Trade Secrets. Publisher: Cengage India.

Reference Books

1. B.Ramakrishna and H.S.Anil Kumar (2017). Fundamentals of Intellectual Property Rights: For Students, Industrialist and Patent Lawyers. Notion Press.
2. V. K. Ahuja(2013). Law relating to Intellectual Property rights (2nd Edn). LexisNexis.
2. R. Radhakrishnan and S. Balasubramanian(2008).Intellectual property rights: Text and Cases. Excel Books India.
4. D. Goeland S. Parashar (2013). IPR Biosafety and Bioethics. Pearson Education India.

CIA EXAMINATION MARK BREAKUP

The CIA Examination mark breakup for the course **Basics of IPR** is given below:

S.No.	Distribution Component	Marks
1	CIA I – 75 Marks Converted to 30	30
2	CIA II – 75 Marks Converted to 30	30
3	Seminar/Objective Capacity Testting	10
4	Seminar/Objective Capacity Testting	10
5	Attendance	05
6	Any Case Study related to IPR (as a Group)	15
	Total	100

QUESTION PAPER PATTERN

The following question paper pattern will be followed for the above said courses:

Section A - Multiple Choice ($10 \times 1 = 10$ Marks)

Section B - Either or Type ($5 \times 5 = 25$ Marks)

Section C - Either or Type ($5 \times 8 = 40$ Marks)

Maximum Marks : 75

Duration : 3 Hours

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

**KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
COIMBATORE - 641029**

**THE MODALITIES FOR THE CONDUCT OF 100% CIA
EXAMINATIONS**

PREAMBLE

As per the recommendations of the Curriculum Development Cell in its meeting held on 27.08.2021, and decision taken in the General Board of Studies meeting held on 16.03.2022, the courses **Cyber Security and Information Security** were introduced in the III semester for all the UG programmes and in the even semester for the PG programme respectively for the students admitted from the academic year 2022-2023 and onwards. Also, it was unanimously decided to conduct 100 % CIA examinations (No End of Semester Examinations) for these courses. The name of the Courses Cyber Security and Information Security are renamed as **Basics of Cyber Security** and **Fundamentals of Information Security** as per the decision taken in the General Board of Studies meeting held on 26.03.2026 for the students to be admitted from the academic year 2026-2027 & onwards. As per the recommendations of the Curriculum Development Cell in its meeting held on 07.03.2022, it was approved in the BOS meeting held on 19.03.2022 to conduct 100% CIA Examinations for the **Extra Departmental Courses** offered in the UG and PG Programmes for the students admitted from the academic year 2022-2023 and onwards. The cited decisions had been approved by the Academic council in its meeting held on 18.04.2022. As per the recommendations of the Curriculum Development Cell in its meeting held on 27.02.2024, and decision taken in the General Board of Studies meeting held on 02.05.2024, the course **Basics of IPR** was introduced in the VI semester for all the UG programmes for the students admitted from the academic year 2024-2025 and onwards and decided to conduct 100 % CIA examinations (NO End of Semester Examinations) for the course.

Hence, the modalities is recommended for the following:

- (i) Conduct of I & II CIA Examinations
- (ii) Question Paper Pattern
- (iii) CIA Examination Mark Breakup
- (iv) Attendance Calculation

CONDUCT OF I & II CIA EXAMINATIONS

1. The CIA Examinations I & II for the above said courses must be conducted along with the other courses under centralized system.
2. The students must appear I & II CIA Examinations compulsorily, since **End of Semester Examinations will NOT be conducted** for the above said courses.
3. If any of the student (s) could not appear for CIA Examinations for the above said courses, with reasons mentioned in the College Calendar, re-examination shall be conducted as per the existing procedures.

QUESTION PAPER PATTERN

The following question paper pattern will be followed for the above said courses:

Section A - Multiple Choice	(10 × 1 = 10 Marks)
Section B - Either or Type	(5 × 5 = 25 Marks)
Section C - Either or Type	(5 × 8 = 40 Marks)

Maximum Marks : 75

Duration : 3 Hours

CIA EXAMINATION MARK BREAKUP

The CIA Examination mark breakup for the courses **Basics of Cyber Security, Fundamentals of Information Security and Basics of IPR** is given below:

S.No.	Distribution Component	Marks
1	CIA I – 75 Marks Converted to 30	30
2	CIA II – 75 Marks Converted to 30	30
3	Seminar/Objective Capacity Testing	10
4	Seminar/Objective Capacity Testing	10
5	Attendance	05
6	Any Case Study related to Cyber Security (as a Group)	15
	Total	100

The CIA Examination mark breakup for the **Extra Departmental Courses** offered for UG/PG Programmes is given below:

S.No.	Distribution Component	Marks
1	CIA I – 75 Marks Converted to 40	40
2	CIA II – 75 Marks Converted to 40	40
3	Seminar/Objective Capacity Testing	05
4	Seminar/Objective Capacity Testing	05
5	Attendance	05
6	Others (Group Discussion, Flipped Class room, etc.,)	05
	Total	100

ATTENDANCE CALCULATION

1. Separate attendance register must be maintained for **Basics of Cyber Security, Fundamentals of Information Security and Basics of IPR** in the Department and the final consolidated Attendance must be submitted to the COE along with the assessment Marks.
2. The attendance must be calculated by using the following formula:
$$\text{Attendance percentage} = \text{Number of Classes attended} / \text{Number of Classes conducted} \times 100$$
3. The students should be allowed to write the CIA examinations as per the existing norms related to attendance. The staff in charge of the respective courses have the responsibility to calculate the attendance percentage and submit the same to the Coordinator of the CIA Examination Committee during the I CIA and II CIA Examinations.
4. If the staff in charge finds that students have not put up enough attendance during the I CIA Examinations, he/she shall counsel the student(s) appropriately so that at the end of the course they have sufficient Attendance.




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Kongunadu Arts & Science College
Kolhapur - 410 29

EDC

UCA 88**Sub.Code:26UCA5XL**

Programme Code:10	<i>For all UG Degree Students</i>			
Title of the Paper:	Extra Departmental Course–Internet and Office Automation Lab			
Batch 2026-2027	Hours/Week 2	Total Hours 30	Credits 3	Skill Development/ Entrepreneurship

Course Objectives

1. Manage email accounts and communications online.
2. Create professional documents using MS-Word.
3. Use MS-Excel for payroll and mark sheet calculations.

Course Outcomes

K3 to K5	CO1	Understanding and remember various menus in office automation.
	CO2	Implementing the concepts of Internet techniques.
	CO3	Executing various calculations of MS-Excel.
	CO4	Analyzing the applications using MS-PowerPoint.
	CO5	Applying the database components to develop table using MS-Access.

LIST OF PRACTICAL PROGRAMS

1. Creation of e-mail Id using Internet.
2. Manipulation of mail by sending and receiving using Internet.
3. Create a mail merge using MS-Word.
4. Prepare Resume using MS-Word.
5. Create a front page for Newspaper using MS-Word.
6. Payroll calculation using MS-Excel.
7. Prepare student marksheet using MS-Excel.
8. Create a slideshow for computer components using MS-PowerPoint.
9. Prepare a photo album using MS-PowerPoint.
10. Promote a brand using MS-PowerPoint.

11. Create a database for stock maintenance and generate report.
12. Create a database for employee and apply query to filter the employee's name that have salary.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student(3Hours/100Marks)

1. Observation – 30 Marks
2. Record Work-5Marks
3. Attendance – 5 Marks
4. Algorithm, Program, Writing and Execution:60Marks.

(CIA Practical I and II – 60 Marks converted into 30 Marks)

Particulars	Program I(Marks)	Program II(Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

**KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
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**I THE MODALITIES FOR THE CONDUCT OF 100% CIA PRACTICAL
EXAMINATIONS (For EDC Courses)**

CONDUCT OF 100% CIA PRACTICAL EXAMINATIONS

1. The Students shall appear for **TWO** CIA practical examinations which are evaluated as 100% internal examinations.
2. The students must appear **TWO** CIA practical examinations compulsorily, since End of Semester examinations will NOT be conducted for the above said course.
3. If any of the student(s) could not appear for CIA Examinations, as per reasons mentioned in the College Calendar, re-examination shall be conducted as per the existing procedures and norms.

The CIA Practical Examination mark breakup for the Extra Departmental Courses (EDC) offered for the UG & PG Programme is given below:

S.No.	Component Distribution	Marks
1.	CIA Practical I – 60 marks converted to 30	30
2.	CIA Practical II – 60 marks converted to 30	30
3.	Continuous assessment of practical (Observation to be submitted*) (15 Experiments/Programs x 2 = 30 marks)	30
4.	Record	05
5.	Attendance	05
Total		100

* In case a student is absent for an Experiment/Program conducted on a particular day, the student will not be allowed to compensate that Experiment/Program and will be awarded zero for that particular Experiment/Program and shall be marked absent. In case any student has an attendance lack; the concerned faculty handling the course in consultation with HoD may permit the student who has an attendance lack to compensate one or two Experiment/Programs as the case may be to enable them to become eligible with mandate of 75% attendance to appear for the Continuous Internal Practical Examinations. However the compensated Experiment/Programs will not be awarded any marks whatsoever.



PRINCIPAL

PRINCIPAL
Kongunadu Arts & Science Col
Coimbatore - 641 029

**GENERAL PAPERS
(EVS and MORAL ETHICS)**

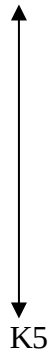
Programme Code:	For B.A., BBA, B. Com, BCA and B.Sc., Degree Students			
PART IV-ENVIRONMENTAL STUDIES				
Batch 2026-2027	Semester I	Hours/Week 2	Total Hours 30	Credits 2

Course Objectives

- To provide a fundamental understanding of natural resources, environmental ethics, and the impact of modern practical conservation and sustainability.
- To inculcate knowledge and create awareness about concepts, components and function of ecosystems
- To appraise on the importance of biodiversity, its values, threats, indigenous and Traditional knowledge systems, conservation strategies, and modern identification tools, and cultivate conscious responsibility and awareness for biodiversity conservation and sustainability.
- To understand the environment threats and pollution, its impacts and mitigation strategies
- To develop an understanding of disasters (natural and man-made) and its preparedness

Course Outcomes

On successful completion of the course, the students will be able to

K1  K5	CO 1	Understand how interactions between organisms and their environments drive the dynamics of individuals, populations, communities and ecosystems
	CO2	Develop an in depth knowledge on the interdisciplinary relationship of cultural, ethical and social aspects of global environmental issues
	CO3	Acquiring values and attitudes towards complex environmental socio-economic challenges and providing participatory role in solving current environmental problems and preventing the future ones
	CO4	To gain inherent knowledge on basic concepts of biodiversity in an ecological context and about the current threats of biodiversity
	CO5	To appraise the major concepts and terminology in the field of environmental pollutants, its interconnections and direct damage to the wildlife, in addition to human communities and Ecosystems

UNIT I: MULTIDISCIPLINARY NATURE OF ENVIRONMENT AND ITS SOCIAL ETHICS AND VALUES (6 HOURS)

Introduction to environment; Historical Development of Human – environment interaction; Industrial revolution, Economic development and its impact on the environment; **Overview of resources:** Definition, Classification of natural resources – biotic and abiotic, renewable and non-renewable. **Renewable Resources:** Water Resources- Rainwater Harvesting, Reservoirs managements, AI & ML tools for water resource management. Sustainable Development goals - Agriculture and Environment. Revisiting traditional agricultural practices- Biodynamic Farming, Physical and Biological soil factors. **Non-renewable Resources-** fossil fuel, nuclear fuel, Energy Resources: Conventional and non-conventional Resources- solar, wind, clean energy- hydrogen, Biomass energy-coir pith, charcoal; Use of exotic/invasive weed biomass for alternative energy/economy. Eg: *Lantana camara*, *Eichhornia Sp*, Genetic Resources and conservation, strategies.

- *Activity:** (i) Analyze your department and its practices towards compliance to SDG's. List out the compliances towards SDG's with justification.
- (ii) Examine your campus' current resource conservation strategies and provide recommendations to improve its sustainability and resource efficiency.

* Students can take up any one of the above.

UNIT II: ECOSYSTEMS (6 HOURS)

Ecosystem- Definition, Components (producers, consumers and decomposers) and functions- Energy flow, Food chains and its types, food web, Disturbances to food chain and food web due to anthropogenic intrusions Eg: Diclofenac Case, Ecological pyramids: types and importance of ecological pyramids, **Types of Ecosystems:** Natural ecosystem- Aquatic Ecosystem (Pond, River, Marine and Estuarine), Terrestrial Ecosystem (Forest, Grassland and Desert). Artificial Ecosystem (Crop land). **Activity:** Develop a working model for an ecosystem through building a Terrarium or Suseum.

UNIT III: BIODIVERSITY AND ITS CONSERVATION (6 HOURS)

Concept of Biodiversity: Definition, Types-Genetic, Species and Ecosystem diversity. Indigenous Knowledge Systems on Biodiversity – Traditional knowledge and legal framework for bioprospecting and Biomimicry. Biodiversity- Values, uses and threats, sustainable use of bioresources for value additions, Conservation strategies of Biodiversity- *In-situ* - National Parks, Wildlife Sanctuaries, Community Reserve and Conservation Reserves, *Ex-situ* – Zoological Park, Aquarium,

Botanical garden. ***Case Study-** Nilgiri Tahr Conservation Project.

Activity: (i) Applications for plant and animal identification by software -*iNaturalist* and Merlin Bird ID

(ii) Field observation and documentation of the campus biodiversity.

UNIT IV: ENVIRONMENTAL THREATS AND POLLUTION

(6 HOURS)

Introduction and Classification of Pollution- physical, chemical and biological; major types of pollution- air, water, soil/land, noise, thermal, radioactive, solid waste, electronic waste (e-waste), plastic, biomedical waste. **Assessment and Monitoring:** Pollution impact assessment/health risk assessment & monitoring techniques, Biological indicators of pollution – Dissolved Oxygen (DO), Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). Impact of pollution and incidence of Life style disorders like Diabetes, Cardio Vascular Disease, Cancer, PCOS etc. **Waste Management** – concept of 3R (Reduce, Recycle and Reuse) and sustainability. ***Case studies:** Dye Industrial pollution from tanneries, paper and pulp industrial effluents in Noyyal and Cauvery rivers.

Activity: Prepare an Audit report for:

(i) Water usage in your department/house

(ii) Magnitude of solid waste generation and its management at your department/house.

UNIT V: DISASTER MANAGEMENT AND PREPAREDNESS

(6 HOURS)

Definition and Classification of Disaster (Natural and Man-made disasters). **Natural Disaster:** Earthquakes, Landslides, Tsunami, Floods, Volcanic eruptions, Cyclones. Wayand- landslides, Joshimath- The sinking Village, Forest fires: causes, spread, control measures. **Man-made Disasters:** Industrial and chemical accidents (Bhopal disaster, oil spills), Nuclear hazards (Chernobyl and Fukushima). Kasargod- Impact of Endosulfan spraying on cashew farms. **Preparedness and safety measures:** Early warning system, response, recovery, mitigation, vulnerability, risk, resilience and capacity building. **Forecasting methods:** Conventional – cloud formation & wind, wave patterns, behaviours of animals & plants, Modern methods – remote sensing, drone and AI tools for impact assessment. ***Case studies:** Chennai flood 2015, causes and control measures.

Activity: Prepare (i) Personal/Class emergency plan

(ii) Risk identification checklist like loose heavy furniture, poor wiring, blocked exits

(iii) A document using Mobile technology to map local resources or identify safer locations.

Field Study: Visit to eco parks'/conservation sites and report.

* Case studies are not for examination purposes.

Text book

1. Workbook on Environmental Science (2026), published by Kongunadu Arts and Science College, Coimbatore-641029.

Reference Books:

1. Fundamentals of Ecology, Odum E.P, Odum H.T & Andrews- Saunders publications
2. Ecology, Environmental science and Conservation. Singh J.S & Gupta SR, S Chand Publishing (2017).
3. This Fissured Land: An Ecological History of India; Gadgil M & Guha R (1993), University of California Press, 1st Edition.
4. Environment (8th Ed.) by Raven PH, Gift, Bary LR, Hassenzahl DM, 2015, Wiley publishing house.
5. R. S. Ambasht, A Text Book of Plant Ecology, Students Friends & Company, 1990 - Plant ecology - 373 pages
6. A. Ravikrishnan (2019), Environmental Science and Engineering (Forth Edition) by Sri Krishna Hitech Publishing Company Pvt.Ltd, Velappanchavadi, Chennai.
7. Yadav, P. (2021). Applied and Economic Zoology. Kedar Nath Ram Nath
8. Krishnamurthy, K. V. (2023). An advanced textbook on biodiversity: Principles and practice. Oxford and IBH Publishing.
9. Anonymous (2003) Professional's The Wildlife (Protection) Act, 1972. Professional Book Publications.
10. National Disaster Management Guidelines - National Disaster Management Information and Communication System (NDMICS) (2011). A publication of the National Disaster Management Authority, Government of India. ISBN: 978-93-80440-12-5, February 2012, New Delhi.
11. Disaster Risk Management Systems Analysis: A Guide Book, Food and Agriculture Organization of the United Nations, Rome (2008). ISBN 978-92-5106056-8.

Web References:

1. <https://egyankosh.ac.in/bitstream/123456789/77368/1/Unit-4.pdf>
2. <https://agritech.tnau.ac.in/pdf/sustainableagriculture.pdf>
3. https://www.dev-practitioners.eu/media/key_documents/SDGs_Booklet_Web_En.pdf
4. <https://www.pmfias.com/environment-ecosystem-components-ecosystem/>
5. <https://www.ugc.gov.in/oldpdf/modelcurriculum/Chapter3.pdf>
6. https://mjcollege.kces.in/pdf/download_documents/study_material_env_studies/ch3.pdf

7. [https://www.deshbandhucollege.ac.in/pdf/resources/1587401626_BA\(H\)-Psc-Eco-Eng-BA\(P\)-II-Ecosystem.pdf](https://www.deshbandhucollege.ac.in/pdf/resources/1587401626_BA(H)-Psc-Eco-Eng-BA(P)-II-Ecosystem.pdf)
8. <http://www.tezu.ernet.in/denvsc/IDC/biodiversity.pdf>
9. <https://egyankosh.ac.in/bitstream/123456789/86424/1/Unit-11.pdf>
10. <https://utkaluniversity.ac.in/wp-content/uploads/2022/05/Environmental-Pollution.pdf>
11. https://cdn.visionias.in/value_added_material/d6c24-disaster_management.pdf
12. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SCIA4001.pdf
13. https://mrcet.com/downloads/MBA/Disaster%20and%20Crisis%20Management_Digital%20Notes.pdf

QUESTION PAPER PATTERN

Maximum Marks : 50

Duration : 3 Hours

Answer all Questions (5×10=50 Marks)

Essay type, Either or type questions from each unit.

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:		For B.A., BBA, B. Com, BCA and B.Sc., Degree Students		
VALUE EDUCATION – MORAL AND ETHICS				
Batch 2026-2027	Semester II	Hours / Week 2	Total Hours 30	Credits 2

COURSE OBJECTIVES

- To impart Value Education in every walk of life.
- To help the students to reach excellence and reap success.
- To impart the right attitude by practicing self-introspection.
- To portray the life and messages of Great Leaders.
- To insist the need for universal brotherhood, patience and tolerance.
- To help the students to keep them fit.
- To educate the importance of Yoga and Meditation.

COURSE OUTCOMES (CO)

After Completion of the Course the student will be able to

K1 ↑ ↓ K5	CO1	will be able to recognize Moral values, Ethics, contribution of leaders, Yoga and its practice
	CO2	will be able to differentiate and relate the day to day applications of Yoga and Ethics in real life situations
	CO3	can emulate the principled life of great warriors and take it forward as a message to self and the society
	CO4	will be able to Analyse the Practical outcome of practicing Moral values in real life situation
	CO5	could Evaluate and Rank the outcome of the pragmatic approach to further develop the skills

SYLLABUS**UNIT I****(4 Hours)**

Moral and Ethics: Introduction – Meaning of Moral and Ethics – Social Ethics – Ethics and Culture – Aim of Education.

UNIT II**(6 Hours)**

Life and Teachings of Swami Vivekananda: Birth and Childhood days of Swami Vivekananda – At the Parliament of Religions – Teachings of Swami Vivekananda

UNIT III**(4 Hours)**

Warriors of our Nation: Subhas Chandra Bose – Sardhar Vallabhbhai Patel – Udham Singh – V. O. Chidambaram Pillai – Bhagat Singh – Tiruppur Kumaran – Dheeran Chinnamalai – Thillaiaadi Valliammai – Velu Nachiyar – Vanchinathan.

UNIT IV**(8 Hours)**

Fundamentals of Yoga: Introduction to Yoga – Benefits of Yoga - Principles of Yoga Practice– Yoga for Health and Well Being – Yoga for Peace – Yoga for Success – Brain Yoga Benefits – The Science of Yoga - Importance of Yoga in Modern Life

UNIT V**(8 Hours)**

Yoga Practices: Warm-Up Exercises in Yoga: Neck, Shoulder, Wrist, Hip, Knee and Ankle Rotations - Basic Yoga Asanas: Tadasana, Vrikshasana, Bhujangasana, Vajrasana, Shavasana and Ardhasiddhasana – Surya Namaskar - Pranayama - Meditation and Relaxation.

Text Books

- Value Based Education – Moral and Ethics – compiled by Kongunadu Arts and Science College (Autonomous), 3rd Edition (2024).

Reference Books

1. Swami Vivekananda - A Biography, Swami Nikhilananda, Advaita Ashrama, India, 24th Reprint Edition (2010).
2. Gandhi, Nehru, Tagore and other eminent personalities of Modern India, Kalpana Rajaram, Spectrum Books Pvt. Ltd., revised and enlarged edition(2004).
3. Freedom Fighters of India, Lion M.G. Agrawal, Isha Books Publisher, First Edition (2008).
4. Easy steps to Yoga by Swami Vivekananda, A Divine Life Society Publication(2000).

Web References:

1. <https://youtu.be/4UXFb7Cs3PU?si=6c50D1IfFvxTXdX>
2. <https://youtu.be/zCag6hbDIQw?si=kNWsrIxQXvOKfacp>
3. https://youtu.be/_2GgRQJ9IbU?si=Xp_YEcCSR8mvMEG-
4. <https://youtu.be/ZkyN4Dy4kO0?si=BkctTS1W3jDS886v>

MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	H	S	S
CO2	S	S	S	H	H
CO3	S	H	S	H	H
CO4	S	H	S	H	H
CO5	S	H	H	S	S

S – Strong

H – High

M – Medium

L – Low

Question Paper Pattern**(External only)**

Duration: 3 hours

Total Marks: 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

NON- MAJOR ELECTIVE

Programme Code:	For B.A., BBA, B.Com, BCA and B.Sc., Degree Students		
PART IV– NON-MAJOR ELECTIVE – I – HUMAN RIGHTS			
Batch	Hours/ Week	Total Hours	Credits
2026-2027	2	30	2

Course Objectives

1. To prepare for responsible citizenship with awareness of the relationship between Human Rights, democracy and development.
2. To impart education on national and international regime on Human Rights.
3. To sensitive students to human suffering and promotion of human life with dignity.
4. To develop skills on human rights advocacy
5. To appreciate the relationship between rights and duties
6. To foster respect for tolerance and compassion for all living creature.

Course Outcomes

After Completion of the Course the student will be able to

K1 ↑ ↓	CO1	To understand the hidden truth of Human Rights by studying various provisions in the Constitution of India.
	CO2	To acquire overall knowledge regarding the Feminist perspectives in the Liberative Empowerment of Women.
	CO3	To gain knowledge about various gender roles and stereotypes involved in the comprehension of gender equality and women's rights.
	CO4	To comprehend the legal provisions and policies that foreground the safety of children in the society and to promote awareness.
K5	CO5	To gain enhanced knowledge about sexual and gender minorities to recognize, celebrate and acknowledge the diversified forms of gender expressions and rights.

SYLLABUS

UNIT I (6 Hours)

HUMAN RIGHTS HUMANS RIGHTS CONSTITUTION OF INDIA: Humans

Rights - Constitution Of India.

UNIT II (6 Hours)

WOMEN EMPOWERMENT IN INDIA: Feminism And Sexual Violence - Women and Liberation

UNIT III (6 Hours)
GENDER EQUALITY AND WOMEN'S RIGHTS: Stereotype Gender Roles -

Women's Education, Power and Science

UNIT IV (6 Hours)

RIGHTS OF THE CHILD IN INDIA: Status of child in contemporary Indian society -
Special Laws and Policies for protection of children

UNIT V (6 Hours)

SOGIESC RIGHTS: Understanding SOGIESC- basic Definitions- inclusivity of SOGIESC-importance of studying SOGIESC- presence of SOGIESC in Indian Traditions- temples and cultural practices that exemplify SOGIESC in India- Genetics of Sex determination- Genetics of Intersex community- Successful SOGIESC Personalities and achievers – Alan Turing- Sally Ride- Leonardo da Vinci- Alan Hart- Virginia Woolf- Bayard Rustin- Padmini Prakash- Akkai Padmashali- K. Prithika Yashini- Laxmi Narayan Tripathi- Madhu Bai Kinnar- Manabi Bandhopadhyay- SOGIESC Rights and laws

Books for Study:

1. Human Rights (2024) Compiled by Kongunadu Arts and Science College, Coimbatore –29.

REFERENCES:

1. Human Rights, (2018) by Jaganathan, MA., MBA., MMM., ML., ML., (Humanitarian Law) and J.P. Arjun

Proprietor: Usha Jaganathan, Refugee Law, Law series, 1st floor, Narmatha Nanthi Street, Mahathma Gandhi Nagar, Madurai – 625014.

2. Country Report on SOGIESC Rights In India: An Unfinished Agenda.

Weblink: <https://www.ilgaasia.org/publications/india-country-report-an-unfinished-agenda>

3. Intersex.

Weblink: <https://my.clevelandclinic.org/health/articles/16324-intersex>

4. SOGIESC Personalities:

<https://www.bbc.com/news/world-asia-india-29357630>

https://en.wikipedia.org/wiki/Laxmi_Narayan_Tripathi https://en.wikipedia.org/wiki/Akkai_Padmashali

<https://www.indiatoday.in/india/story/prithika-yashini-india-first-transgender-police-officer-tamil-nadu-969389-2017-04-04>

<https://yourstory.com/2018/03/first-transgendre-college-principal-west-bengal>

5. SOGIESC Rights and laws

<https://www.openglobalrights.org/lgbtqia-to-sogiesc-reframing-sexuality-gender-human-rights/>

<https://static1.squarespace.com/static/5a84777f64b05fa9644483fe/t/625ead0484f9005d75b92dd0/1650371887436/ILGA+Asia+India+Report+2021.pdf>

QUESTION PAPER PATTERN

Duration: 3 Hours

Max. Marks: 75

SECTION A

(5 x 5 = 25 marks)

Short answers, either or type, one question from each unit.

SECTION B

(5 x 10 = 50 marks)

Essay type questions, either or type, one question from each unit.

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme Code:	<i>For B.A., BBA, B. Com, BCA and B.Sc., Degree Students</i>		
	Part IV -NON- MAJOR ELECTIVE – II WOMEN’S RIGHTS		
Batch 2026-2027	Hours / Week 2	Total Hours 30	Credits 2

Course Objectives

1. To know about the laws enacted to protect Women against violence.
2. To impart awareness about the hurdles faced by Women.
3. To develop a knowledge about the status of all forms of Women to access to justice.
4. To create awareness about Women’s rights.
5. To know about laws and norms pertaining to protection of Women.
6. To understand the articles which enables the Women’s rights.
7. To understand the Special Women Welfare laws.
8. To realize how the violence against Women puts an undue burden on healthcare services.

Course Outcomes

After Completion of the Course the student will be able to

K1 ↑ ↓ K5	CO1	Appraise the importance of Women’s Studies and incorporate Women’s Studies with other fields
	CO2	Analyze the realities of Women Empowerment, Portrayal of Women in Media, Development and Communication
	CO3	Interpret the laws pertaining to violence against Women and legal consequences
	CO4	Contribute to the study of the important elements in the Indian Constitution, Indian Laws for Protection of Women
	CO5	Spell out and implement Government Developmental schemes for women and create awareness on modernization and impact of technology on Women

Syllabus

Unit I

(6 Hours)

Women’s Studies: Basic concepts of Women’s studies in Higher education, Women’s studies perspectives- Socialization- Patriarchy- Women’s studies as an academic discipline- Growth and development of Women’s studies as a discipline internationally and in India.

Unit II

(6 Hours)

Socio-Economic Development of Women: Family welfare measures, role of Women in economic development, representation of Women in media, status of Women land rights, Women Entrepreneurs, National policy for the empowerment of women.

Unit III (6 Hours)

Women's Rights – Access to Justice: Crime against Women, domestic violence – physical abuse- verbal abuse – emotional abuse - economic abuse – minorities, dowry- harassment and death, code of conduct for work place, abetment of suicide.

Unit IV (6 Hours)

Women Protective acts: Protective legislation for Women in the Indian constitution- Anti dowry, SITA, PNDT, and Prevention Sexual Harassment at Workplace (Visaka case), Domestic violence (Prevention) Act.

Unit V (6 Hours)

Women and Child welfare: Safety provisions - various forms of mass media, radio, visual, internet, cyber space, texting, SMS and smart phone usage. Healing measures for the affected Women and child society by private and public sector, NGO and society.

Text Book:

1. **Women's Rights** (2021), compiled by Kongunadu Arts & Science College, Coimbatore – 641 029.

Reference Books:

1. **“Rights of Indian Women”** by Vipul Srivatsava. Publisher: Corporate Law Advisor, 2014.
2. **“Women's security and Indian law”** by Harsharam Singh. Publisher: Aabha Publishers and Distributors, 2015.
3. **“Women's Property Rights in India”** by Kalpaz publications, 2016.

QUESTION PAPER PATTERN**Duration: 3 Hours****Max. Marks: 75****SECTION A**

(5 x 5 = 25 marks)

Short answers, either or type, one question from each unit.

SECTION B

(5 x 10 = 50 marks)

Essay type questions, either or type, one question from each unit.

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

UCA 103

Programme	For B.A., BBA CA, B. Com, BCA and B.Sc., Degree Students		
PART IV - NON- MAJOR ELECTIVE III - CONSUMER AFFAIRS			
Batch	Hours/Week	Total Hours	Credits
2026-2027	2	30	2

Course Objectives

1. To familiarize the students with their rights and responsibilities as a consumer.
2. To understand the procedure of redress of consumer complaints.
3. To know more about decisions on Leading Cases by Consumer Protection Act.
4. To get more knowledge about Organizational set-up under the Consumer Protection Act
5. To impart awareness about the Role of Industry Regulators in Consumer Protection
6. To understand Contemporary Issues in Consumer Affairs

Course Outcomes

K5 ↑ ↓ K1	CO1	Able to know the rights and responsibility of consumers.
	CO2	Understand the importance and benefits of Consumer Protection Act.
	CO3	Applying the role of different agencies in establishing product and service standards.
	CO4	Analyze to handle the business firms' interface with consumers.
	CO5	Assess Quality and Standardization of consumer affairs

Syllabus

UNIT I

(6 Hours)

Conceptual Framework - Consumer and Markets: Concept of Consumer, Nature of markets: Liberalization and Globalization of markets with special reference to Indian Consumer Markets, E-Commerce with reference to Indian Market, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP), Fair Price, GST, labeling and packaging along with relevant laws, Legal Metrology. Experiencing and Voicing Dissatisfaction: Consumer buying process, Consumer Satisfaction/dissatisfaction-Grievances-complaint, Consumer Complaining Behaviour: Alternatives available to Dissatisfied Consumers; Complaint Handling Process: ISO 10000 suite.

UNIT II

(6 Hours)

The Consumer Protection Law in India - Objectives and Basic Concepts: Consumer rights and UN Guidelines on consumer protection, Consumer goods, defect in goods, spurious goods and services, service, deficiency in service, unfair trade practice, restrictive trade practice. Organizational set-up under the Consumer Protection Act: Advisory Bodies: Consumer Protection Councils at the Central, State and District Levels; Adjudicatory Bodies: District.

UNIT III

(6 Hours)

Grievance Redressal Mechanism under the Indian Consumer Protection Law - Who can file a complaint? Grounds of filing a complaint; Limitation period; Procedure for filing and hearing of a complaint; Disposal of cases, Relief/Remedy available; Temporary Injunction, Enforcement of order, Appeal, frivolous and vexatious complaints; Offences and penalties. Leading Cases decided under Consumer Protection law by Supreme Court/National Commission: Medical Negligence; Banking; Insurance; Housing & Real Estate; Electricity and Telecom Services; Education; Defective Products; Unfair Trade Practices.

UNIT IV

(6 Hours)

Role of Industry Regulators in Consumer Protection

- i. Banking: RBI and Banking Ombudsman
- ii. Insurance: IRDA and Insurance Ombudsman
- iii. Telecommunication: TRAI
- iv. Food Products: FSSAI
- v. Electricity Supply: Electricity Regulatory Commission
- vi. Real Estate Regulatory Authority

UNIT V

(6 Hours)

Contemporary Issues in Consumer Affairs - Consumer Movement in India: Evolution of Consumer Movement in India, Formation of consumer organizations and their role in consumer protection, Misleading Advertisements and sustainable consumption, National Consumer Helpline, Comparative Product testing, Sustainable consumption and energy ratings.

UCA 105

Quality and Standardization: Voluntary and Mandatory standards; Role of BIS, Indian Standards Mark (ISI), Ag-mark, Hallmarking, Licensing and Surveillance; Role of International Standards: ISO an Overview.

Note: Unit 2 and 3 refers to the Consumer Protection Act, 2086. Any change in law would be added appropriately after the new law is notified.

SUGGESTED READINGS

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007) Consumer Affairs, Universities Press.
2. Choudhary, Ram Naresh Prasad (2005). Consumer Protection Law Provisions and Procedure, Deep and Deep Publications Pvt Ltd.
3. G. Ganesan and M. Sumathy. (2012). Globalisation and Consumerism: Issues and Challenges, Regal Publications
4. Suresh Misra and Sapna Chadah (2012). Consumer Protection in India: Issues and Concerns, IIPA, New Delhi
5. Rajyalaxmi Rao (2012), Consumer is King, Universal Law Publishing Company
6. Girimaji, Pushpa (2002). Consumer Right for Everyone Penguin Books.
7. E-books :-www.consumereducation.in
8. Empowering Consumers e-book, www.consumeraffairs.nic.in
9. ebook, www.bis.org
10. The Consumer Protection Act, 1986 and its later versions.

Question paper pattern

Duration: 3 hrs.

Max: 75 Marks

Section A (5 x 5=25)

Short notes

Either – or / type – question from each unit.

Section B (5 x 10=50)

Essay type

Either – or / type – question from each unit.

Programme Code:	ALL UG COURSES	
Title of the Paper: HEALTH AND WELLNESS		
Batch 2026 – 2027	Semeste r IV	Credit s 2

Skill Areas:

Physical Fitness, Nutrition, Mental Health, Awareness on Drug addiction and its effects.

Purpose:

The Health & Wellness course focuses on teaching the elements of physical, mental, emotional, social, intellectual, environmental well-being which are essential for overall development of an individual. The course also addresses the dangers of substance abuse and online risks to promote emotional and mental health.

Learning Outcomes:

Upon completion of the Health & Wellness course, students will be able to:

1. Demonstrate proficiency in sports training and physical fitness practices.
2. Improve their mental and emotional well-being, fostering a positive outlook on health and life.
3. Develop competence and commitment as professionals in the field of health and wellness.
4. Awareness on drug addiction and its ill effects

Focus:

During the conduct of the Health & Wellness course, the students will benefit from the following focus areas:

1. Stress Management.
2. Breaking Bad Habits.
3. Improving Interpersonal Relationships.
4. Building Physical Strength & Inner Strength.

Role of the Facilitator:

The faculty plays a crucial role in effectively engaging with students and guiding them towards achieving learning outcomes. Faculty participation involves the following areas:

1. **Mentorship & Motivation:** The Facilitator mentors students in wellness and self-discipline while inspiring a positive outlook on health. Faculty teach stress management, fitness, and daily well-being.
2. **Promoting a Safe and Inclusive Environment:** The facilitator ensures a safe, inclusive, and respectful learning environment for active student participation and benefit.
3. **Individualized Support and Monitoring Progress:** The facilitator plays a crucial role in providing personalized support, monitoring and guidance to students.

Guided Activities

In this course, several general guided activities have been suggested to facilitate the achievement of desired learning outcomes. They are as follows:

1. Introduction to Holistic Well-being.
2. Holistic Wellness Program- Nurturing Body and Mind
3. Breaking Bad Habits Workshop.
4. Improving the elements of physical, emotional, social, intellectual, environmental and mental well-being.
5. Creating situational awareness, digital awareness.
6. Understanding substance abuse, consequences and the way out.

Period Distribution

The following are the guided activities suggested for this Audit course.

The Physical Director should plan the activities by the students.

Arrange the suitable Mentor/Guide for the wellness activities.

Additional activities and programs can be planned for Health and Wellness.

S.No.	Guided Activities	Period
1	Introduction to Holistic Well-being 1. Introduce the core components of Health & Well-being namely Physical, mental and emotional well-being. 2. Provide worksheets on all the four components individually and explain the interconnectedness to give an overall understanding.	
2	Wellness Wheel Exercise (Overall Analysis) • Guide students to assess their well-being in various life dimensions through exercises on various aspects of wellbeing and explain the benefits of applying wellness wheel. • Introduce Tech Tools. • Explore the use of technology to support well-being. • Introduce students to apps for meditation, sleep tracking or healthy recipe inspiration.	
3	Breaking Bad Habits (Overall Analysis) • Open a discussion on bad habits and their harmful effects. • Provide a worksheet to the students to identify their personal bad habits. • Discuss the trigger, cause, consequence and solution with examples. Guide them to replace the bad habits with good ones through worksheets.	
4	Physical Well-being 1. Fitness Introduce the different types of fitness activities such as basic exercises, cardiovascular exercises, strength training exercises, flexibility exercises, so on and so forth. (Include theoretical explanations and outdoor activity). 2. Nutrition Facilitate students to reflect on their eating habits, their body type, and to test their knowledge on nutrition, its sources and the benefits. 3. Yoga & Meditation Discuss the benefits of Yoga and Meditation for one's overall health. Demonstrate different yoga postures and their benefits on the body	

	through visuals (pictures or videos) 4. Brain Health Discuss the importance of brain health for daily life. Habits that affect brain health (irregular sleep, eating, screen time). Habits that help for healthy brains (reading, proper sleep, exercises). Benefits of breathing exercises and meditation for healthy lungs. 5. Healthy Lungs Discuss the importance of lung health for daily life. Habits that affect lung health (smoking, lack of exercises). Benefits of breathing exercises for healthy lungs. 6. Hygiene and Grooming Discuss the importance of hygienic habits for good oral, vision, hearing and skin health. Discuss the positive effects of grooming on one's confidence level and professional growth. Suggested Activities (sample); Nutrition: Invite a nutritionist to talk among the students on the importance of nutrition to the body or show similar videos shared by experts on social media. Organize a 'Stove less/fireless cooking competition' for students where they are expected to prepare a nutritious dish and explain the nutritive values in parallel.	
5	Emotional Well-being 1. Stress Management Trigger a conversation or provide self-reflective worksheets to identify the stress factors in daily life and their impact on students' performance. Introduce different relaxation techniques like deep breathing, progressive muscle relaxation, or guided imagery. (use audio recordings or visuals to guide them through these techniques). After practicing the techniques, have them reflect on how these methods can help manage stress in daily life. 2. Importance of saying 'NO'. Explain the students that saying 'NO' is important for their Physical and mental well-being, Academic Performance, Growth and Future, Confidence, Self-respect, Strong and Healthy Relationships, building reputation for self and their family (avoid earning a bad name). Factors that prevent them from saying 'NO'. How to practice saying 'NO'.	

	3. Body Positivity and self-acceptance Discuss the following with the students. • What is body positivity and self-acceptance? • Why is it important? • Be kind to yourself. • Understand that everyone's unique. <u>Suggested Activities (Sample):</u> (Importance of saying 'NO') Provide worksheets to self-reflect on..... ...how they feel when others say 'no' to them ...the situations where they should say 'no' Challenge students to write a song or rap about the importance of saying no and how to do it effectively. Students can perform their creations for the class.	
6	Social Well-Being 1. Practicing Gratitude Discuss the importance of practicing gratitude for building relationships with family, friends, relatives, mentors and colleagues. Discuss how one can show gratitude through words and deeds. Explain how practicing gratitude can create 'ripple effect'. 2. Cultivating Kindness and Compassion Define and differentiate between kindness and compassion. Explore practices that cultivate these positive emotions. Self-Compassion as the Foundation. The power of small gestures. Understanding another's perspective. The fruits of compassion. 3. Practicing Forgiveness Discuss the concept of forgiveness and its benefits. Forgiveness: What is it? and What it isn't? Benefits of forgiveness. Finding forgiveness practices. 4. Celebrating Differences Appreciate the value of individual differences and foster inclusivity. The World: A Tapestry of Differences (cultures, backgrounds, beliefs, abilities, and appearances). Finding strength in differences (diverse perspectives and experiences lead to better problem-solving and innovation).	

	Celebrating differences, not ignoring them (respecting and appreciating the unique qualities). Activities for celebrating differences (share culture, learn about others, embrace new experiences). 5. Digital Detox Introduce the students to: The concept of a digital detox and its benefits for social well-being. How to disconnect from devices more often to strengthen real-world connections. Suggested Activities (sample): (Practicing Gratitude) Provide worksheets to choose the right ways to express gratitude. Celebrate 'gratitude day' in the college and encourage the students to honor the house keeping staff in some way to express gratitude for their service	
7	Intellectual Well-being 1. Being a lifelong Learner Give students an understanding on: The relevance of intellectual well-being in this 21st century to meet the expectations in personal and professional well-being The Importance of enhancing problem-solving skills Cultivating habits to enhance the intellectual well-being (using the library extensively, participating in extra-curricular activities, reading newspaper etc.) 2. Digital Literacy Discuss: The key aspects of digital literacy and its importance in today's world. It is more than just liking and sharing on social media. The four major components of digital literacy (critical thinking, communication, problem-solving, digital citizenship). Why is digital literacy important? Boosting one's digital skills. 3. Transfer of Learning Connections between different subjects - How knowledge gained in one area can be applied to others.	

	<u>Suggested Activities(sample):</u> Intellectual Well-being. Provide worksheets to students for teaching them how to boost intellectual well-being. Ask the students to identify a long-standing problem in their locality, and come up with a solution and present it in the classroom. Also organize an event like 'Idea Expo' to display the designs, ideas, and suggestions, to motivate the students to improve their intellectual well-being.	
8	Environmental Well-being 1.The Importance of initiating a change in the environment. The session could be around: Defining Environmental well-being (physical, chemical, biological, social, and psychosocial factors) People's behaviour, crime, pollution, political activities, infra-structure, family situation etc. Suggesting different ways of initiating changes in the environment (taking responsibility, creating awareness, volunteering, approaching administration). <u>Suggested Activities (sample):</u> Providing worksheets to self-reflect on how the environment affects their life, and the ways to initiate a change. Dedicate a bulletin board or wall space (or chart work) in the classroom for students to share their ideas for improving environmental well-being. Creating a volunteers' club in the college and carrying out monthly activities like campus cleaning, awareness campaigns against noise pollution, (loud speakers in public places), addressing anti-social behaviour on the campus or in their locality.	
9	Mental Well-being 1. Importance of self-reflection Discuss: Steps involved in achieving mental well-being (self-reflection, self-awareness, applying actions, achieving mental well-being). Different ways to achieve mental well-being (finding purpose, coping with stress, moral compass, connecting for a common cause). The role of journaling in mental well-being. 2. Mindfulness and Meditation Practices Benefits of practicing mindful habits and meditation for overall well-being. 1. Connecting with nature Practicing to be in the present moment - Nature walk, feeling the sun, listening to the natural sounds. Exploring with intention - Hiking, gardening to observe the nature.	

	Reflecting on the emotions, and feeling kindled by nature. 2. Serving people Identifying the needs of others. Helping others. Volunteering your time, skills and listening ear. Finding joy in giving. 3. Creative Expressions Indulging in writing poems, stories, music making/listening, creating visual arts to connect with inner selves. <u>Suggested Activities (Sample):</u> (Mindfulness and Meditation) Conducting guided meditation every day for 10 minutes and directing the students to record the changes they observe.	
10	Situational Awareness (Developing Life skills) 1. Being street smart Discuss: Who are street smarts? Why is it important to be street smart? Characteristics of a street-smart person: Importance of acquiring life skills to become street smart (General First-aid procedure, CPR Procedure, Handling emergency situations like fire, flood etc). 2. Digital Awareness Discuss: Cyber Security Information Literacy Digital Privacy Fraud Detection <u>Suggested Activities (sample):</u> (Street Smart) Inviting professionals to demonstrate the CPR Procedure Conducting a quiz on Emergency Numbers	
11	Understanding Addiction Plan this session around: Identifying the environmental cues, triggers that lead to picking up this habit. Knowing the impact of substance abuse Adverse health conditions, social isolation, ruined future, hidden financial loss and damaging the family reputation. Seeking help to get out of this addiction. <u>Suggested Activities:</u> Provide Worksheets to check the students' level of understanding about	

	substance addiction and their impacts. Share case studies with students from real-life. Play/share awareness videos on addiction/de-addiction, experts talk. *Conduct awareness programmes on Drugs and its ill effects. (Arrange Experts from the concerned government departments and NGOs working in drug addiction issues) and maintain the documents of the program.	
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Closure:

Each student should submit a Handwritten Summary of their Learnings & Action Plan for the future.

Assessments:

- Use Self-reflective worksheets to assess their understanding.
- Submit the worksheets to internal audit/external audit.
- Every student's activities report should be documented and the same have to be assessed by the Physical Director with the mentor. The evaluation should be for 100 marks. No examination is required.

Scheme of Evaluation

Part	Description	Marks
A	Report	40
B	Attendance	20
C	Activities (Observation During Practice)	40
Total		100

References/Resource Materials:

The course acknowledges that individual needs for references and resources may vary. However, here are some general reference materials and resources that may be helpful:

1. The Well-Being Wheel:



2. **Facilities & Spaces:** Some activities may require access to specific facilities, resources or spaces. Students may need to coordinate with the college administration to reserve these as required.

3. Online Resources:

1. United Nations Sustainable Development Goals - Goal 3-Good Health & Well-Being: <https://www.un.org/sustainabledevelopment/health/>
2. Mindfulness and Meditation: Stanford Health Library offers mindfulness and meditation resources:
<https://healthlibrary.stanford.edu/books-resources/mindfulness-meditation.html>
3. Breaking Bad Habits: James Clear provides a guide on how to build good habits and break bad ones: <https://jamesclear.com/habits>
4. 6 Ways to Keep Your Brain Sharp
<https://www.lorman.com/blog/post/how-to-keep-your-brain-sharp>
5. What Is Social Wellbeing? 12+ Activities for Social Wellness
<https://positivepsychology.com/social-wellbeing/>
6. How Does Your Environment Affect Your Mental Health?
<https://www.verywellmind.com/how-your-environment-affects-your-mental-health-5093687>
7. How to say no to others (and why you shouldn't feel guilty)
<https://www.betterup.com/blog/how-to-say-no>

JOC

Programme code:10	<i>For ALL UG Students</i>			
Title of the Paper:	JOC -1 OPEN-SOURCE DESIGNING TOOLS LAB			
Batch 2026-2027	Hours / Week 2	Total Hours 30	Credits 2	Skill Development/ Entrepreneurship

Course Objectives

1. To Develop proficiency in using design tools
2. Understand the principles of design, typography, color theory, and composition to create professional quality graphics.
3. Learn to design branding materials, including business cards, banners, and social media posts, for marketing and promotional purposes.

LIST OF PRACTICAL PROGRAMS

1. Design a series of engaging social media posts for a product launch, campaign, or event.
2. Design a banner for a fictional website or online store.
3. Create a professional business card for a business or personal brand.
4. Use photo manipulation techniques to combine different images or elements into a single composition.
5. Design a t-shirt graphic for a specific target audience or event.
6. Design a restaurant menu that showcases the restaurant's offerings with an attractive layout and typography. Include sections for starters, main courses, and desserts.
7. Design a social media banner for an upcoming event. The banner should be optimized for platforms like Facebook, Instagram, and Twitter.
8. Design a business card that includes a QR code linking to the business's website or portfolio
9. Create a flex banner for a cultural event, including event name, date, time, venue, and an attractive visual theme.
10. Design a wedding invitation card incorporating a personalized theme with details such as couple names, wedding date, venue, and RSVP information.
11. Design a professional visiting card for a company, using a modern design aesthetic. Ensure the card includes name, designation, contact information, and company logo.
12. Design a workshop poster with details like title, speakers, venue, and time. Use appropriate imagery and colors.

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

UCA 118

Programme code:10	For ALLUG Students			
Title of the Paper: JOC - 2 IoT SIMULATION TOOLS LAB				
Batch	Hours / Week	Total Hours	Credits	Skill Development
2026-2027	2	30	2	

Course Objectives

1. To gain knowledge on the concepts of IOT programming.
2. To design IoT applications in different domain and be able to analyze the performance
3. To know the various hardware and sensing technologies to build IoT applications.

LIST OF PRACTICAL PROGRAMS

1. Write a Program to Blink LED (Turn an LED on and off)
2. Design a program calculate the distance using ultrasonic sensor
3. Implement the program for LED light on/ off
4. Design program for detect water drops.
5. Write a program for Smart Door Lock System
6. Design program for detect the person using fingerprint sensor.
7. Write a program to detect presence of Gas using GAS Sensor
8. Write a program to detect motion using Motion Sensor (PIR sensor)
9. Write a Program to measure Temperature and Humidity using DHT11 Sensor
10. Write a Program to count the number of buttons pushes.
11. Write a program to water overflow system.
12. Design a program for Smart Agriculture activities.

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

UCA 119

Programme Code:10	<i>For ALL UG Students</i>			
Title of the Paper:		JOC -3 DATA VISUALIZATION LAB		
Batch 2026-2027	Hours / Week 2	Total Hours 30	Credits 2	Skill Development

Course Objectives

1. To implement the concepts of different types of charts for visualization.
2. To understand the concept of visualization using Power BI.
3. To facilitate students to create a Power Bi Dashboard and DAX Calculations.

LIST OF PRACTICAL PROBLEMS

1. Create Bar charts, Line graphs, Pie charts, Scatter plots in Excel and set data legends, scales, axes, title for the above charts.
2. Create an Excel program to Perform Data Validation in Excel like Filters, Grouping, Sorting
3. Create an excel sheet to perform filter and generate statistics using pivot table in Excel.
4. Create an excel sheet to perform Excel VLOOKUP basic Operations.
5. Import the sample datasets into Power BI Desktop for visualization.
6. Create different types of charts for visualize using Power BI.
7. Demonstrate how to add interactivity to visualize through slicers, filters, and drill-through actions.
8. Create relationships between tables using Data Modeling Techniques.
9. Implement DAX Calculations and Measures using Power BI.
10. Create interactive dashboards to showcase insights of Publishing dashboards using Power BI service.
11. Perform time series analysis and create trend charts.
12. Visualize location data using map charts in Power BI.

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

UCA 120

Programme Code:10		For ALL UG Students	
Title of the Paper: JOC -4 – MOBILE APP DEVELOPMENT USING OPEN-SOURCE TOOLS			
Batch 2026-2027	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. To gain knowledge on the concepts of App Development.
2. To design Mobile applications in different domain and be able to analyse the performance
3. To know the various mobile hardware technologies to build the applications.
4. Perform data calculations and display user-friendly outputs.
5. Design clean, user-friendly mobile interfaces.

LIST OF PRACTICAL PROGRAMS

1. Design a mobile shaking app.
2. Implement a speed meter mobile app.
3. Design location sensor in app.
4. Create a countdown timer app.
5. Create location tracker mobile app.
6. Design a light Detector mobile app.
7. Develop a piano app with recording.
8. Design a age calculator app.
9. Create a maths quiz app.
10. Create an app for a Component animation.
11. Develop an animal sound Mobile app.
12. Design a Mark statement mobile app.

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

PGDCA

KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029

**CURRICULUM AND SCHEME OF EXAMINATIONS
(CBCS)**

(2026 – 2027 onwards)



DEPARTMENT OF COMPUTER APPLICATIONS

**KONGUNADU ARTS AND SCIENCE COLLEGE
(AUTONOMOUS)
Coimbatore – 641029**

DEPARTMENT OF COMPUTER APPLICATIONS

Vision

- Our vision is to offer up to date and flexible programs which will allow our graduates to be competitive in the job market.
- To achieve excellent standards of quality education by keeping pace with rapidly changing technologies.
- Integral Formation and Empowerment of students for social transformation through Computer Applications.

Mission:

- To provide outstanding education and training to our graduate students for their productive careers in industry, academia, and government.
- To impart quality and value based education to raise satisfaction level of all stakeholders.
- To empower students with academic excellence, knowledge and training.
- To enable critical thinking among students towards development in IT with reference to social transformation.
- To apply new developments in Information Management and provide all possible support to promote research & development.
- To serve as a platform whereby the student enrich their personalities to assume greater responsibilities.

PROGRAMME OUTCOME (PO)

- PO1 To enhance their skills and new computing technologies through practical and theoretical knowledge of Computer.
- PO2 To exhibit understanding of broad business concepts and principles.
- PO3 To expertise students as computing professionals to earn more and to contribute to the economic development of the region, state and nation.
- PO4 To analyze the impact of computing on individuals, organizations, and society, including ethical, legal, security, and global policy issues.
- PO5 To develop various real time applications using latest technologies and programming languages.
- PO6 To pursue higher education to enhance their skill and Capable of recognizing and resolving ethical issues.
- PO7 To demonstrate the capabilities required to apply cross-functional business knowledge and technologies in solving real-world business problems.
- PO8 To blend analytical, logical and managerial skills with the technical aspects to resolve real world issues.

PROGRAMME SPECIFIC OUTCOME (PSO)

- PSO1 An ability to apply knowledge of computing and mathematics appropriate to the Discipline
- PSO2 An ability to apply current techniques, skills, and tools necessary for computing practice and to integrate IT-based solutions into the user environment effectively.
- PSO3 An ability to apply design and development principles in the construction of software systems of varying complexity.
- PSO4 An ability to use knowledge in various domains to identify real world problems and hence to provide solution to new ideas and innovations.
- PSO5 An ability to design, document and develop robust applications by considering human, financial and environmental factors using cutting edge technologies to address individual and organizational needs.

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
COIMBATORE-641029

Post Graduate Diploma in Computer Applications [PGDCA]

CURICULUM & SCHEME OF EXAMINATION

**[APPLICABLE TO STUDENTS ADMITTED FROM THE
ACADEMIC YEAR 2026-2027 & ONWARDS]**

Semester	Subject code	Title of the Paper	Instruction Hours/Cycle	Exam. Marks			Duration of Exam (hours)	Credits
				CIA	ESE	Total		
I	26PDC101	Core Paper 1- Computer Networks	3	25	75	100	3	3
	26PDC102	Core Paper 2 - Relational Database Management System	3	25	75	100	3	4
	26PDC1CL	Core Practical 1 - Relational Database Management System Lab	3	40	60	100	3	4
	26PDC1CM	Core Practical 2 - Web Designing Lab	3	40	60	100	3	4
II	26PDC203	Core Paper 3 - Software Engineering	3	25	75	100	3	3
	26PDC204	Core Paper 4 - Python Programming	3	25	75	100	3	4
	26PDC2CN	Core Practical 3 - Python Programming Lab	3	40	60	100	3	4
	26PDC2CO	Core Practical 4 - Office Automation Lab	3	40	60	100	3	4
	Total					800		30

Part-wise total marks:

SUBJECT	MARKS	TOTAL CREDITS
Core Theory	400	14
Core Practical	400	16

CIA – Continuous Internal Assessment

ESE – End –of- Semester Examination

50 % CIA is applicable to all subjects for both Theory and Practical

PDC 1

SEMESTER I

SUB.CODE: 26PDC101

Programme	POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS		
Title of the paper:	Core Paper 1 - COMPUTER NETWORKS		
Batch 2026-2027	Hours/ Week 3	Total Hours 45	Credits 3

Course Objectives

1. To deal with basic ideas of networking domain.
2. To present the principles of Cryptography in Computer Networks.
3. To know the classical, advanced encryption standards and techniques, message Authentication codes, digital signatures, email.

Course Outcomes (CO)

K1 to K5	CO1	Understanding cryptography and network security concepts and application.
	CO2	Applying security principles in system design.
	CO3	Detecting network security threats.
	CO4	Understanding the various cryptographic algorithms.
	CO5	Evaluating the challenges in building networks.

Syllabus

UNIT I

(9 Hours)

Introduction: Uses of computer networks: Business Applications-Home- Applications-Mobile Users-Social Issues. Network Hardware: LAN-MAN-WAN– Reference Models.

PDC 2

SUB.CODE: 26PDC101
(9 Hours)

UNIT II

The Physical layer: Guided transmission media – Magnetic media-Twisted pair - Coaxial cable – Fiber Optics –Comparison of Fiber optics and Copper wire- modems- Switching.

UNIT III (9 Hours)

The Data link layer: Data link layer design Issues – Error Detection and Correction. Bluetooth: Blue tooth Architecture, **Bluetooth Applications** *.Data link layer switching: repeaters, hubs, bridges, switches, routers and gateways.

UNIT IV (9 Hours)

The Network layer: Network layer design issues – Routing algorithms: The optimality principle, shortest path routing- The Transport layer: Elements of Transport protocols.

UNIT V (9 Hours)

The Application layer: DNS – The Domain Name System – **Electronic mail: Architecture and services** *, Cryptography – DES – Digital Signatures: Symmetric-Key Signatures, Public-Key signatures.

* denotes self study

Text Book

1. Andrew S. Tanenbaum, “**Computer Networks**”, Sixth Edition - Pearson Education Publication, 2021.

Reference Books:

1. Behrouz A. Forouzan,(2007), “**Data Communications and Network**”, Second Edition, Tata McGraw Hill.
2. William A Shay, (2001),“**Understanding data communications and Networks**” , Second Edition -Vikas Publication.

PDC 3

MAPPING

CO	PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1		S	S	H	S	S
CO2		S	H	S	H	M
CO3		S	H	M	H	S
CO4		S	M	S	M	H
CO5		S	H	H	S	H

S– Strong **H** – High

M – Medium

L – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme	POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS		
Title of the paper: Core Paper 2 - RELATIONAL DATABASE MANAGEMENT SYSTEM			
Batch 2026-2027	Hours/ Week 3	Total Hours 45	Credits 4

Course Objectives

1. To develop the knowledge in various Database concepts.
2. It also gives introduction to SQL language to retrieve the data from the database with suitable application development.
3. To be able to construct a new normalized database.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic concepts of database management systems and database Techniques
	CO2	Understand Data constraints and CODDs rules, DML and DDL statements of ORACLE,
	CO3	Apply various DDL and DML statements, joins queries, PL / SQL statements.
	CO4	Analyze the granting and revoking permissions, cursors.
	CO5	Evaluating the challenges in building networks.

UNIT I

(9 Hours)

Introduction: Purpose of Database Systems - View of Data - Data Models - Database Languages - Database Administrator - Database Users. Entity Relationship Model: Basic concepts –Mapping Cardinalities.

UNIT II

(9 Hours)

Entity Relationship Diagram- E-R Features - Relational Model: Structure of Relational Databases - Relational Algebra. Interactive SQL: Invoking SQL * Plus- data definition- data manipulation in DBMS – The oracle data types.

UNIT III (9 Hours)

DML and DDL statements-Data constraints- arithmetic, logical operators- oracle functions- grouping data from tables.

UNIT IV (9 Hours)

Manipulating dates- union, intersect and minus clause-Granting permissions-Revoking permissions- Codd's Rules- Normalization.

UNIT V (9 Hours)

PL/SQL: Introduction, PL/SQL syntax, understanding PL/SQL block structure, oracle transactions, cursors, stored procedures, stored functions, database triggers.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, (2006), Database System Concepts, Fifth Edition, Tata McGraw Hill Publication
2. Ivan Bayross, (2007), Commercial application development using ORACLE developer 2000, First Edition.

Reference Books:

1. Bipin.C.Desai, (2000), An Introduction to database systems, First Edition, Galgotia Publication.
2. Ivan Bay Ross, Oracle 7 The Complete Reference, First Edition, BPB Publications, Chennai.

MAPPING

PS O CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	S	H	M	H	S
CO4	S	M	S	M	H
CO5	S	H	H	S	H

S– Strong**H** – High**M** – Medium**L** – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme	POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS		
Title of the paper: Core Practical 1 - RELATIONAL DATABASE MANAGEMENT SYSTEM LAB			
Batch 2026-2027	Hours/ Week 3	Total Hours 45	Credits 4

Course Objectives

1. To understand the use of Structured Query Language (SQL) and its syntax.
2. To understand and apply the principles of data modeling using entity relationship and develop a good database design.
3. To study the concepts and techniques relating query processing using SQL engines.

Course Outcomes (CO)

K3 to K5	CO1	Designing the basic concepts of database.
	CO2	Implementing data integrity constraints in database.
	CO3	Validating the various fundamental tasks to perform data modeling.
	CO4	Implementing functions, packages, stored procedures and user defined exception.
	CO5	Evaluate the trigger function to perform event.

LIST OF PRACTICAL PROGRAMS

1. Create a student mark list and do the following
 - Alter the table to add total and average fields with required size.
 - Modify to increase the total field size.
 - Calculate the total and average.
2. Create two tables in the name Employee_Personal and Employee_Salary using Primary and Foreign key concept and perform necessary operations.

PDC 8

SUB.CODE: 26PDC1CL

- Display the employee details who are all getting salary above 15000.
 - Display the employee name and address who are all coming from city “Coimbatore” or “Chennai”.
 - Display the employee name, who are all coming from city “Coimbatore” and pincode 641029 or 641001.
 - Display the employee details in descending order based on name.
3. Create a table and perform the queries using comparison, logical, set, sorting and grouping operators.
 4. Write necessary queries to perform oracle built-in functions.
 5. Write PL/SQL block to prepare electricity bill.
 6. Write PL/SQL block:
 - ✓ Find the sum of individual number.
 - ✓ Find the given number is Armstrong number or not
 7. Create a Database Triggers to check the validity of records
 8. Use SQL queries to manage Views.

Guidelines to the distribution of marks for practical Examinations:

- Two questions will be given for each student (3 Hours / 60 Marks)
- Record Work - 10 Marks
- Algorithm, Program, Typing and Execution: 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

PDC 9**SUB.CODE: 26PDC1CL****MAPPING**

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	S	H	M	H	S
CO4	S	M	S	M	H
CO5	S	S	S	S	S

S– Strong**H** – High**M** – Medium**L** – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme	POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS		
Title of the paper:	Core Practical 2 - WEB DESIGNING LAB		
Batch 2026-2027	Hours/ Week 3	Total Hours 45	Credits 4

Course Objectives

1. To understand the basic concepts principles involved in website development.
2. To gain Basic knowledge in HTML tags and skill of creating web pages.
3. To gain knowledge about internet and it applications.

Course Outcomes (CO)

K3 to K5	CO1	Learn and visualize the basic concept of HTML.
	CO2	Understanding and recognize the elements of HTML.
	CO3	Analyzing the principle and basics concept of Frameset.
	CO4	Applying the principles and techniques of web page creation.
	CO5	Evaluating the functionality of Web pages using HTML.

LIST OF PRACTICAL PROGRAMS

1. Write HTML tags to display sentence with different font sizes
2. Implement the concept of Links using HTML tags.
3. Display image in web page using HTML tag.
4. Implement the types of Lists in a webpage.
5. Write HTML tags to implement Text formatting.
6. Create a static webpage using Table tags of HTML.
7. Implement the concept of Frameset in HTML.

8. Write HTML tag to display text with Marquee properties.
9. Design a new web page, which shows your Biodata.
10. Design a web page for your department.

Guidelines to the distribution of marks for practical Examinations:

- Two questions will be given for each student (3 Hours / 60 Marks)
- Record Work - 10 Marks
- Algorithm, Program, Typing and Execution: 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

PDC 12**SUB.CODE: 26PDC1CM****MAPPING**

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	S	H	M	H	S
CO4	S	M	S	M	H
CO5	S	S	S	S	S

S– Strong **H** – High **M** – Medium **L** – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

PDC 13
SEMESTER II

SUB.CODE: 26PDC203

Programme	POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS		
Title of the paper:	Core Paper 3 - SOFTWARE ENGINEERING		
Batch 2026-2027	Hours/ Week 3	Total Hours 45	Credits 3

Course Objectives

1. To understand the basic theory of Software Engineering.
2. To describe software engineering layered technology and Process frame work.
3. To gain knowledge about quality control and how to ensure good quality software.

Course Outcomes (CO)

K1 to K5	CO1	Learning the fundamentals of software engineering concepts.
	CO2	Understanding common lifecycle processes such as waterfall model, spiral model, prototyping model, evolutionary models etc.,
	CO3	Applying the principles and techniques of software engineering in the architectural design, detail design, and implementation of software applications.
	CO4	Developing the software using different testing concepts.
	CO5	Evaluating the ability of students to perform various lifecycle activities like Analysis, Design, Implementation, Testing and Maintenance.

UNIT I

(9 Hours)

Introduction- The Evolving role of S/W-S/W crisis-S/W Myths-S/W engineering technology- The/w process-S/w Process models- The Prototyping model.

UNIT II

Requirements engineering-System modelling- requirements analysis and elicitation for S/W- S/W prototyping- specification-mechanics of structured analysis-data dictionary- elements of analysis model- data modelling.

UNIT III

(9 Hours)

Object oriented design-design for object-oriented systems-the system design process - s/w design and s/w engineering- the design process-design principles- design concepts- effective modular design- design heuristics for effective modularity.

UNIT IV

(9 Hours)

Mapping requirements into a s/w architecture- transform mapping- transaction mapping- user interface design-interface design activities-s/w testing techniques- S/W testing fundamentals-White box testing-Basis path testing- Control structure testing- Black box testing.

UNIT V

(9 Hours)

Software testing strategies-A strategic approach to S/W Testing-Validation testing-system Testing- the art of debugging- S/W quality-S/W re-engineering-Reverse engineering- **Building blocks for CASE- A taxonomy of CASE tools***

*Self-study

Text Book:

1. Ian Sommerville, “Software Engineering”, 10th Edition, 2017, Pearson Publishers.
2. Roger S Pressman, “Software Engineering”, 5th Edition, 2001, TMH Publishers.

PDC 15

SUB.CODE: 26PDC203

Reference Books:

1. Watts S Humphrey, “A discipline for software engineering”, Pearson Education Publishers, 2001.
2. Ian Somerville, “Software Engineering”, 6th Edition Pearson Education publications, 2001.

MAPPING

CO \ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	S	H	M	H	S
CO4	S	M	S	M	H
CO5	S	S	S	H	H

S– Strong

H – High

M – Medium

L – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme	POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS		
Title of the paper:	Core Paper 4 - PYTHON PROGRAMMING		
Batch 2026-2027	Hours / Week 3	Total Hours 45	Credits 4

Course Objectives

1. To understand the fundamentals of Python Programming.
2. To get knowledge about the Functions in Python.
3. To understand the concepts of List and String methods.

Course Outcomes (CO)

K1 to K5	CO1	To implement basic concepts of operators and functions.
	CO2	To Review various string, list, tuple and dictionaries.
	CO3	To evaluate the functionality of an exception handling.
	CO4	To analyze the concept of classes and objects.

Unit I**(9 Hours)**

Introduction – Python Overview - Statements – Comments – Identifiers – Keywords- Data types.

Unit II**(9 Hours)**

Python Program Flow: Indentation - Simple Input & Output – Simple Output Formatting – Operators in Python –Control Statements - Looping Statement.

Unit III

(9 Hours)

Functions: Built-in- Functions – User Defined Functions – Parameters and Arguments –
Function Calls

Unit IV

(9 Hours)

Strings and Lists

Unit V

(9 Hours)

Tuples and Dictionary

Text book:

1. E. Balagurusamy (2017), Problem Solving and Python Programming by, McGraw-Hill first edition.

Reference books:

1. Ashok Namdev Kamthane, Amit Ashok Kamthane (2017), Programming and Problem Solving with Python.
2. John B. Schneider Shira Lynn Broschat Jess Dahmen (2019), Algorithmic Problem Solving with Python.

PDC18**SUB.CODE: 26PDC204****MAPPING**

CO \ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	H	H	S	H	M
CO3	S	H	S	H	S
CO4	H	M	S	M	H
CO5	S	H	M	H	H

S–Strong**H**–High**M**–Medium**L**–Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme	POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS		
Title of the paper:	Core Practical 3 - PYTHON PROGRAMMING LAB		
Batch 2026-2027	Hours / Week 3	Total Hours 45	Credits 4

Course Objectives

1. To gain knowledge about the fundamentals of python programming.
2. To understand the concepts of string, list, tuple.
3. To implement the concept of exception handling, classes and objects.

Course Outcomes (CO)

K3 - K5	CO1	To implement basic operators and function concepts.
	CO2	To Review various string and list methods.
	CO3	To execute exception handling.

LIST OF PRACTICAL PROGRAMS

1. Write a python program to check prime number.
2. Write a python program to display Fibonacci series using recursion.
3. Write a Python Program to Convert Decimal to Binary, Octal and Hexadecimal.
4. Write a Python Program to demonstrate String Operations.
5. Write a Python Program to Check Whether a String is Palindrome or Not
6. Write a Python function that accepts a string and counts the number of Upper case and Lowercase letters.
7. Write a Python function to calculate the Factorial of a number
8. Write a Python function to sum all the numbers in a list.
9. Python Program to Check if a Key is Already Present in a Dictionary
10. Write a Python Program to demonstrate Working with Tuples.

Guidelines to the distribution of marks for practical examinations:

- Two questions will be given for each student (3 Hours / 60 Marks)
- Record Work - 10 Marks
- Algorithm, Program, Typing and Execution: 50 Marks.

Particulars	Program 1 (Marks)	Program 2 (Marks)
Algorithm	10	10
Design	10	10
Result	5	5

MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	H	H	S	H	M
CO3	S	H	S	H	S
CO4	H	M	S	M	H
CO5	S	H	M	H	H

S–Strong

H–High

M–Medium

L–Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD

Programme	POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS		
Title of the Paper:	Core Practical 4 - OFFICE AUTOMATION LAB		
Batch 2026-2027	Hours / Week 3	Total Hours 45	Credits 4

Course Objectives

1. To understand the basic concepts of MS-Word.
2. To develop database using MS-Access.
3. To understand the concepts in MS-Excel.

Course Outcomes (CO)

K3 to K5	CO1	Learning the formatting skills on paragraphs, tables and lists.
	CO2	Generating various visualization representations
	CO3	Understanding and remember various menus in office automation
	CO4	Applying the database components to develop table using MS-Access
	CO5	Implementing the basics of MS -Excel

LIST OF PRACTICAL PROBLEMS

1. Create a mail merge using MS-word
2. Prepare Resume using Ms-word.
3. Create a front page for Newspaper using MS-Word.
4. Prepare Student mark sheet using MS-Excel.
5. Payroll calculation using MS-Excel.

6. Create a Bar Chart in excel for Result Analysis
7. Create database for stock maintenance and generate report.
8. Create a table in MS-Access.

Guidelines to the distribution of marks for practical Examinations:

- Two questions will be given for each student (3 Hours / 60 Marks)
- Record Work - 10 Marks
- Algorithm, Program, Typing and Execution: 50 Marks.

Particulars	Program 1 (Marks)	Program 2 (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

PDC 23**SUB.CODE: 26PDC2CO****MAPPING**

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	S	H	M	H	S
CO4	S	M	S	M	H
CO5	S	S	S	H	H

S– Strong**H** – High**M** – Medium**L** – Low

Content prepared by (Based on Inputs)	
Signature of the Course in-charge	Signature of the HOD