

KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

Coimbatore - 641 029



DEPARTMENT OF COMPUTER SCIENCE WITH DATA ANALYTICS

**CURRICULUM AND SCHEME OF EXAMINATIONS
(2026 - 2027)**

DEPARTMENT OF COMPUTER SCIENCE WITH DATA ANALYTICS

Vision

To emerge as a throbbing and pioneering academic and research hub of global standards to empower students in Computer Science with Data Analytics.

Mission

- To incorporate modern trends in Data Science and Analytics.
- To fuel the passion in student community to excel in all fronts like logical thinking, decision making, reliability and application based on strong theoretical foundation and extensive practical training.
- To undertake industry – institute collaborations for knowledge and technology exchange.
- To generate new knowledge by high impact research in data analytics that has significant benefits for individual, industry and society by enabling better decision making.

Programme Outcomes (POs)	
On successful completion of the B.Sc. Computer Science with Data Analytics	
PO1	Demonstrate comprehensive knowledge in Computer Science and Data Analytics and effectively fulfill assigned responsibilities with professionalism, efficiency, and adherence to quality standards.
PO2	Apply analytical reasoning, critical thinking, and computational skills to identify, formulate, analyze, and solve complex problems, leading to logical and evidence-based conclusions.
PO3	Design, develop, and implement innovative and research-oriented solutions to complex computing and data-driven problems while considering societal, environmental, health, safety, and cultural factors.
PO4	Exhibit effective listening, reading, writing, and presentation skills to communicate technical and non-technical information clearly and professionally to diverse audiences.
PO5	Develop leadership qualities and managerial abilities to make informed decisions, motivate teams, and effectively manage professional and organizational responsibilities.
PO6	Function effectively as an individual and as a member or leader of multidisciplinary teams, contributing positively toward the achievement of common goals.
PO7	Uphold ethical principles, professional integrity, and social responsibility by evaluating the impact of decisions and actions on society and actively contributing to community welfare and sustainable development.
PO8	Utilize modern computing tools, data analytics techniques, and emerging technologies effectively to analyze data, derive meaningful insights, and support informed decision-making.

Programme Specific Outcomes (PSOs)	
After the successful completion of B.Sc. Computer Science with Data Analytics programme the students are expected to	
PSO1	Impart education with domain knowledge effectively and efficiently in par with the expected quality standards for Data Analyst professional.
PSO2	Ability to apply the mathematical, technical and critical thinking skills in the discipline of Data analytics to find solutions for complex problems.
PSO3	Ability to engage in life-long learning and adopt fast changing technology to prepare for professional development.
PSO4	Expose the students to key technologies in data science and business analytics: data mining, machine learning, visualization techniques, predictive modeling, and statistics.
PSO5	Inculcate effective communication skills combined with professional & ethical attitude.

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

COIMBATORE – 641 029

Programme Name: **B. Sc Computer Science with Data Analytics**

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	26UDA101	Core Paper 1- Problem Solving using C Programming	5	25	75	100	3	4
	III	26UDA1CL	Core Practical 1- Problem Solving using C Lab	5	40	60	100	3	3
	III	26UDA1A1	Allied Paper 1 - Discrete Mathematics and Statistics	6	25	75	100	3	5
	IV	26EVS101	Environmental Studies **	2	-	50	50	3	2
	Total			30	-	-	550	-	20
II	I	26TML202	Language II@	6	25	75	100	3	3
	II	26ENG202	English –II	6	25	75	100	3	3
	III	26UDA202	Core Paper 2 - Object Oriented Programming in Java	5	25	75	100	3	4
	III	26UDA2CM	Core Practical 2- Object Oriented Programming in Java Lab	5	40	60	100	3	3
	III	26UDA2A2	Allied Paper 2 - Optimization Techniques and Linear Algebra	6	25	75	100	3	5
	IV	26VED201	Value Education- Moral and Ethics**	2	-	50	50	3	2
	Total			30	-	-	550	-	20
III	I	26TML303	Language III@	6	25	75	100	3	3
	II	26ENG303	English –III	6	25	75	100	3	3
	III	26UDA303	Core Paper 3- Python Programming	4	25	75	100	3	4
	III	26UDA3CN	Core Practical 3 - Python Programming Lab	4	40	60	100	3	3
	III	26UDA3A3	Allied Paper 3 – Distributed Operating System	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	26UDA404	Core Paper 4- Fundamentals of Data Analytics	3	25	75	100	3	4
	III	26UDA4CO	Core Practical 4- Data Analytics and its Applications Lab	5	40	60	100	3	3
	III	26UDA4A4	Allied Paper 4 – Design and Analysis of Algorithms	6	25	75	100	3	5
	IV	26UDA4SL	Skill Based Subject 2- Web Design 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	26UDA505	Core Paper 5- R Programming	5	20	55	75	3	3
	III	26UDA5CP	Core Practical 5- R Programming Lab	6	40	60	100	3	4
	III	26UDA506	Core Paper 6- Relational Database Management System	5	25	75	100	3	4
	III	26UDA5CQ	Core Practical 6 – Relational Database Management System Lab	6	40	60	100	3	4
	III	26UDA5OP	Generative AI ##	1	25	-	25	2	1
	III	26UDA5E1	Major Elective Paper 1 -	5	25	75	100	3	5
	IV	-	EDC	2	100	-	100	3	3
	-	26UDA5IT	Internship Training ****	Grade					
Total				30	-	-	600	-	24
VI	III	26UDA607	Core Paper 7- Artificial Intelligence and its Applications	5	25	75	100	3	4
	III	26UDA6CR	Core Practical 7- Artificial Intelligence and Machine Learning Lab	5	40	60	100	3	4
	III	26UDA608	Core Paper 8- Machine Learning	5	25	75	100	3	4
	III	26UDA6CS	Core Practical 8- Data Visualization Lab	4	40	60	100	3	4
	III	26UDA6E2	Major Elective Paper 2 -	5	25	75	100	3	5
	III	26UDA6Z1	Project and Viva Voce***	4&&	20	80	100	-	5
	IV	26UBI6S3	Skill Based Subject 3- Basics of Intellectual Property Rights	2	100	-	100	3	3
Total				30	-	-	700	-	29
V		26NCC \$ / NSS/YRC /PYE/ECC/ RRC/WEC10 1#	Cocurricular Activities*	-	50	-	50	-	1
Grand Total				-	-	-	3800	-	140

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.

**** 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.

One credit Self Study Course.

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 8 papers)

1. Internet of Things
2. Software Testing and Quality Assurance
3. Cloud Computing Fundamentals
4. Digital Forensics
5. Natural Language Processing
6. Deep Learning
7. Data Warehousing and Data Mining
8. Cryptography and Information system

Non-Major Elective Papers

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

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

26UDA5XL - Internet Basics and Advanced Excel 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)

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^{ss}, 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 credits
 - 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 Classroom/Powerpoint 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 perspectives.

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:
 - One session / week / course and each session shall be for 30 minutes in duration, with follow-up learning activities.
 - 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 options 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)	25
CIA II	75		
Objective Capacity Testing */Seminar		5	
Attendance		5	
Practical			
CIA Practical		25	40
Observation Notebook		10	
Attendance		5	
One Credit Course			
CIA I/Seminar/Assignment/Online quiz (any one)		10	25
CIA II/Seminar/Assignment/Online quiz (any one)		10	
Case Study		5	
Project			
Review		15	20
Regularity		5	
Theory (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

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	

(iii) CIA I & II and ESE: 50 Marks (One Credit Course – Duration 2 hours)

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

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