



## Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)  
 Approved by Government of Tamil Nadu & Accredited by NAAC with A++ Grade (3<sup>rd</sup> Cycle - 3.64 CGPA)  
 Dr. N.G.P. - Kalapatti Road, Coimbatore – 641 048, Tamil Nadu, India  
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### REGULATIONS 2023-24 for Under Graduate Programme (Outcome Based Education model with Choice Based Credit System)

**Bachelor of Science in Computer Science with Data Analytics Degree**  
 (For the students admitted during the academic year 2023-24 and onwards)

**Programme: B. Sc. (Computer Science with Data Analytics)**

#### Eligibility

Candidates for admission to the first year of the **Bachelor of Science (Computer Science with Data Analytics)** Degree Programme shall be required to have passed in the Higher Secondary Examinations conducted by the Government of Tamil Nadu in the relevant subjects or an Examination accepted as equivalent there to by the Academic Council. Subject to such other conditions as may be prescribed there to are permitted to appear and qualify with any one of the following subjects: Mathematics / Computer Science / Statistics / Business Mathematics and wherever the students have not studied Mathematics, the necessary Mathematics knowledge be imparted through Tutorial/ Bridge Course.

#### Programme Educational Objectives

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. Demonstrate expertise to solve diverse range of problems in computer science.
2. Exhibit skills for employment in industries especially in the field of Data Analytics.
3. Practice professional ethics and remain socially responsible.
4. Involve in life-long learning by adapting contemporary technologies, tools and Methodologies.
5. Progress towards higher studies and entrepreneurship



## PROGRAMME OUTCOMES

On the successful completion of the program, the following are the expected outcomes.

PO Number	PO Statement
PO1	Ability to apply knowledge of Computer science and mathematics to identify problems and model solutions
PO2	Ability to analyze large data sets in the context of real world problems and interpret results
PO3	Ability to Design, Implement and Evaluate solutions for computing problems
PO4	Ability to apply current techniques, skills and tools necessary for data analytics
PO5	Ability to exhibit soft skills and understand professional and social responsibilities



*Guidelines for Programmes offering Part I & Part II for Four Semesters*

Part	Subjects	No. of Papers	Credit	Semester No.
I (12 Credits)	Tamil / Hindi / French/Malayalam	4	4 x 3 = 12	I to IV
II (12 Credits)	English	4	4 x 3 = 12	I to IV
III (108 Credits)	Core (Credits 4)	11	11 x 4 = 44	I to VI
	Core (Credits 3)	2	2 x 3 = 6	I to VI
	Core (Credits 5) (Embedded- Core )	2	2 x 5 = 10	III to IV
	Core Project (Credits 4)	1	1 x 4 = 4	VI
	Core Practical (Credits 2)	3	3 x 2 = 6	I to VI
	Inter Departmental Course (IDC)	4	4 x 4 = 16	I to IV
	Discipline Specific Elective (DSE)	3	3 x 4 = 12	V & VI
	Skill Enhancement Course (SEC)	4	4 x 2 = 8	III, IV, V & VI
IV (8 Credits)	Industrial Training	1	1 x 2 = 2	V
	Environmental Studies (AECC)	1	2	I
	Basic Tamil/Advance Tamil/Human Rights, & Women's Rights (AECC)	1	2	II
	Innovation & IPR/ Innovation, IPR & Entrepreneurship (AECC)	1	2	VI
V (2 Credits)	Generic Elective (GE)	1	1 x 2 = 2	V
	NSS/NCC/YRC/RRC/Yoga/Sports	-	2	I - II
TOTAL CREDITS			142	



Dr. NGPASC

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*B.Sc. Computer Science with Data Analytics (Students admitted during the AY 2023-24)*

CURRICULUM  
B. Sc. Computer Science with Data Analytics

Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits
							CIA	ESE	Total	
<b>First Semester</b>										
<b>Part- I</b>										
231TL1A1TA	Language-I	Tamil-I	4	1	-	3	25	75	100	3
231TL1A1HA		Hindi-I								
231TL1A1MA		Malayalam-I								
231TL1A1FA		French -I								
<b>Part- II</b>										
231EL1A1EA	Language-II	English -I	4	-	1	3	25	75	100	3
<b>Part- III</b>										
234AI1A1CA	Core - I	Problem Solving and Programming in C	4	1	-	3	25	75	100	4
234DA1A1CP	Core Practical - I	C Programming	-	-	4	3	40	60	100	2
234IT1A1CA	Core -II	Digital Computer Fundamentals	4	-	-	3	25	75	100	4
232MT1A1ID	IDC -I	Mathematics for Computing-I	4	1	-	3	25	75	100	4
<b>Part-IV</b>										
233MB1A1AA	AECC-I	Environmental Studies	2	-	-	-	50	-	50	2
<b>Part-V</b>										
234DA1A1XA	Extension Activity	NSS/NCC/ YRC/RRC/ Yoga/Sports	-	-	-	-	50	-	50	1
<b>Total</b>			<b>22</b>	<b>03</b>	<b>05</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>700</b>	<b>23</b>

*Dr. N. G. P.*  
9/6/23

**BoS Chairman/HoD**  
Department of Computer Science with Data Analytics  
Dr. N. G. P. Arts and Science College  
Coimbatore - 641 048  
COIMBATORE | INDIA

 <b>Dr. N. G. P. Arts and Science College</b>		
<b>APPROVED</b>		
BoS - 8th 09.06.23	AC - 15th 14.07.23	AB - 20th 05.08.23



B.Sc. Computer Science with Data Analytics (Students admitted during the year 2023-24)

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
<b>Second Semester</b>										
<b>Part-I</b>										
231TL1A2TA	Language-I	Tamil-II	4	1	-	3	25	75	100	3
231TL1A2HA		Hindi-II								
231TL1A2MA		Malayalam-II								
231TL1A2FA		French -II								
<b>Part- II</b>										
231EL1A2EA	Language-II	English -II	4	-	1	3	25	75	100	3
<b>Part- III</b>										
234CA1A2CA	Core -III	Data Structures	4	1	-	3	25	75	100	4
234CS1A2CA	Core -IV	Object Oriented Programming with C++	4	-	-	3	25	75	100	4
234DA1A2CP	Core Practical-II	Data Structures using C++	-	-	4	3	40	60	100	2
232MT1A2ID	IDC -II	Mathematics for Computing-II	4	1	-	3	25	75	100	4
<b>Part-IV</b>										
231TL1A2AA	AECC-II	Basic Tamil/ Advance Tamil/Human Rights and Women's Rights	2	-	-	-	50	-	50	2
231TL1A2AB										
235CR1A2AA										
<b>Part-V</b>										
234DA1A2XA	Extension Activity	NSS/NCC/ YRC/RRC/ Yoga/Sports	-	-	-	-	50	-	50	1
<b>Total</b>			<b>22</b>	<b>03</b>	<b>05</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>700</b>	<b>23</b>



Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
<b>Third Semester</b>										
<b>Part – I</b>										
231TL1A3TA	Language-I	Tamil-III	3	1	-	3	25	75	100	3
231TL1A3HA		Hindi-III								
231TL1A3MA		Malayalam-III.								
231TL1A3FA		French -III								
<b>Part – II</b>										
231EL1A3EA	Language-II	English -III	3	1	-	3	25	75	100	3
<b>Part – III</b>										
234DA1A3CA	Core-V	Database System Concepts	4	-	-	3	25	75	100	4
234DA1A3CP	Core Practical - III	Programming in Java	3	-	4	3	40	60	100	5
234CS1A3CA	Core -VI	Operating Systems	3	-	-	3	25	75	100	3
234DA1A3SP	SEC - I	Database Systems	-	-	4	3	40	60	100	2
232MT1A3ID	IDC -III	Discrete Mathematics	4	-	-	3	25	75	100	4
Total			20	02	08	-	-	-	700	24



Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
<b>Fourth Semester</b>										
<b>Part – I</b>										
231TL1A4TA	Language-I	Tamil-IV	3	1	-	3	25	75	100	3
231TL1A4HA		Hindi-IV								
231TL1A4MA		Malayalam-IV								
231TL1A4FA		French –IV								
<b>Part – II</b>										
231EL1A4EA	Language-II	English -IV	3	1	-	3	25	75	100	3
<b>Part – III</b>										
234DA1A4CA	Core -VII	Machine Learning	4	-	-	3	25	75	100	4
234DA1A4CP	Core Practical - IV	Python Programming	3	-	4	3	40	60	100	5
234DA1A4CB	Core VIII	Software Engineering	3	-	-	3	25	75	100	3
234DA1A4SP	SEC -II	Data Mining	-	-	4	3	40	60	100	2
235CO1A4IA	IDC - IV	Customer Relationship Management	4	-	-	3	25	75	100	4
<b>Total</b>			<b>20</b>	<b>02</b>	<b>08</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>700</b>	<b>24</b>



Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
<b>Fifth Semester</b>										
<b>Part – III</b>										
234CT1A5CA	Core – IX	Computer Networks	4	1	-	3	25	75	100	4
234DA1A5CA	Core – X	R Programming	4	1	-	3	25	75	100	4
234DA1A5CB	Core - XI	Big Data Technologies	4	1	-	3	25	75	100	4
234DA1A5CP	Core Practical - V	Big Data Technologies	-	-	4	3	40	60	100	2
234DA1A5SP	SEC - III	Web Designing	-	-	4	3	40	60	100	2
234DA1A5DA	DSE-I	Cloud Computing	4	1	-	3	25	75	100	4
234DA1A5DB		Web Analytics								
234DA1A5DC		Text Analytics								
234DA1A5TA	IT	Industrial Training	-	-	-	3	40	60	100	2
<b>Part-IV</b>										
	GE		2	-	-	-	50	-	50	2
Total			18	04	08	-	-	-	750	24





Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Sixth Semester										
Part – III										
234DA1A6CA	Core -XII	Next Generation Databases	4	-	-	3	25	75	100	4
234DA1A6CB	Core -XIII	Artificial Intelligence	4	-	-	3	25	75	100	4
234DA1A6SP	SEC -IV	Data Visualization	-	-	4	3	40	60	100	2
234DA1A6CV	Core – XIV	Project Work	-	-	8	3	40	60	100	4
234DA1A6DA	DSE –II	Data Security and Privacy	4	-	-	3	25	75	100	4
234DA1A6DB		Social Media Analytics								
234DA1A6DC		Healthcare Analytics								
234DA1A6DD	DSE –III	Internet of Things	4	-	-	3	25	75	100	4
234DA1A6DE		Human Computer Interaction								
234DA1A6DF		Ethics for Data Science								
Part – IV										
233BC1A6AA	AECC-III	Innovation, IPR and Entrepreneurship	2	-	-	-	50	-	50	2
Total			18	-	12	-	-	-	650	24
*Grand total									4200	142



### DISCIPLINE SPECIFIC ELECTIVE

Students shall select the desired course of their choice in the listed elective course during Semesters V & VI

#### Semester V (Elective I)

##### List of Elective Courses

S. No.	Course Code	Name of the Course
1	234DA1A5DA	Cloud Computing
2	234DA1A5DB	Web Analytics
3	234DA1A5DC	Text Analytics

#### Semester VI (Elective II)

##### List of Elective Courses

S. No.	Course Code	Name of the Course
1	234DA1A6DA	Data Security and Privacy
2	234DA1A6DB	Social Media Analytics
3	234DA1A6DC	Healthcare Analytics

#### Semester VI (Elective III)

##### List of Elective Courses

S. No.	Course Code	Name of the Course
1	234DA1A6DD	Internet of Things
2	234DA1A6DE	Human Computer Interaction
3	234DA1A6DF	Ethics for Data Science

### GENERIC ELECTIVE COURSES (GE)

The following are the courses offered under Generic Elective Course

#### Semester V

S. No.	Course Code	Name of the Course
1	234DA1A5GA	Introduction to Data Analytics

### EXTRA CREDIT COURSES

The following are the courses offered under self-study to earn extra credits:

#### Semester III

S. No.	Course Code	Name of the Course
1	234DA1ASSA	Decision Support Systems
2	234DA1ASSB	Software Testing



## UG - REGULATION (R5)

(2023-24 and onwards)

### (OUTCOME BASED EDUCATION WITH CBCS)

#### 1. NOMENCLATURE

**1.1 Faculty:** Refers to a group of programmes concerned with a major division of knowledge Eg. Faculty of Computer Science consists of disciplines like Departments of Computer Science, Information Technology, Computer Technology, Computer Applications, Data Analytics, Cognitive Systems, Artificial Intelligence and Machine Learning and Cyber Security

**1.2 Programme:** Refers to the Bachelor of Science / Commerce / Arts stream that a student has chosen for study.

**1.3 Batch:** Refers to the starting and completion year of a programme of study. Eg. Batch of 2023-26 refers to students belonging to a 3 year Degree programme admitted in 2023 and completing in 2026.

**1.4 Course:** Refers to component of a programme. A course may be designed to involve lectures / tutorials / laboratory work / seminar / project work/ practical training / report writing / Viva- voce, etc., or a combination of these, to meet effectively the teaching learning needs.

- a) **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement
- b) **Inter Disciplinary Course (IDC):** A course chosen generally from a related discipline/subject with an intention to seek exposure in the discipline relating to the core domain of the student
- c) **Discipline Specific Elective (DSE) Course:** Elective courses offered under main discipline/ subject of study.
- d) **Skill Enhancement Courses (SEC):** Value-based and/or skill-based courses which are aimed at providing hands-on-training, competencies, skills, etc.
- e) **Ability Enhancement Compulsory Courses (AECC):** Mandatory courses that lead to Knowledge enhancement. Environmental Science, Human Rights and Women's Rights, Basic Tamil/ Advanced Tamil, Innovation and IPR, Innovation, IPR and Entrepreneurship.
- f) **Ability Enhancement Elective Course (AEEC)/Generic Elective (GE)** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is Generic Elective.



### 1.5 Project Work:

Course involving application of knowledge in problem solving / analyzing /exploring a real life situation / difficult problem. The Project work will be given in lieu of a Core paper.

### Internship/Industrial Training

Students must undertake industrial / institutional training for a minimum of 15 days during the IV semester summer vacation. The students will submit the report for evaluation during V semester.

### 1.6 Extra Credits:

Extra credits shall be awarded for achievements in identified curricular/co-curricular/Extracurricular activities executed outside the regular class hours. Extra credits are not mandatory for completing the programme.

## 2. STRUCTURE OF PROGRAMME

### 2.1 PART- I: LANGUAGE- I

Tamil or any one of the languages namely Malayalam, Hindi and French will be offered under Part – I in the first four semesters.

### 2.2 PART- II: LANGUAGE- II

English will be offered during the first four semesters.

### 2.3 PART- III:

- Core Course
- Inter Departmental Course (IDC)
- Discipline Specific Elective (DSE)
- Skill Enhancement Course (SEC)
- Industrial Training (IT)

### 2.4 PART- IV:

#### 2.4.1 Ability Enhancement Compulsory Course (AECC):

The Ability Enhancement Compulsory Courses such as i)Environmental Studies, ii) Human Rights and Womens' Rights, iii) Innovation and IPR/ Innovation, IPR and Entrepreneurship are offered during I,II and VI Semester.

Basic Tamil

a) Those who have not studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take oneBasic Tamil coursein the second semester.



(OR)

Advanced Tamil

b) Those who have studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take one Advanced Tamil course in the second semester.

**Note:** Students who come under the above a+b categories are exempted from Human Rights and Women's Rights in the second semester.

**Ability Enhancement Elective Course (AEEC)/Generic Elective (GE)** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is Generic Elective offered in V semester. (Theory/Practical/Non-Lab Practical)

### 2.5 PART- V: EXTENSION ACTIVITIES

The following extracurricular activities like NSS/YRC/NCC/RRC/Yoga/Sports/Clubs are offered under extension activities during semester I & II. Students will be evaluated based on their active participation in any one of the above activities. 75% Attendance is compulsory for extension activity.

### 3. CREDIT ALLOTTMENT

The following is the credit allotment:

- Lecture Hours (Theory) : 1 credit per lecture hour per week
- Laboratory Hours : 1 credit for 2 Practical hours per week
- Project Work : 1 credit for 2 hours of project work per week

### 4. DURATION OF THE PROGRAMME

The B.A. /B.Com./B. Sc. Programme must be completed within 3 years (6 semesters) and a maximum of 6 years (12 semesters) from the date of acceptance to the programme. If not, the candidate must enroll in the course determined to be an equivalent by BoS in the most recent curriculum recommended for the Programme.

### 5.REQUIREMENTS FOR COMPLETION OF A SEMESTER

Every student shall ordinarily be allowed to keep terms for the given semester in a program of his/ her enrolment, only if he/ she fulfills at least seventy five percent (75%) of the attendance taken as an average of the total number of lectures, practicals, tutorials, etc. wherein short and/or long excursions/field visits/study tours organised by the college and supervised by the faculty as envisaged in the syllabus shall be credited to his/her attendance. Every student shall have a minimum of 75% as an overall attendance.



## 6. EXAMINATIONS

The end semester examinations shall normally be conducted after completing 90 working days for each semester. The maximum marks for each theory and practical course shall be 100 with the following breakup:

### a) Mark distribution for Theory Courses

Continuous Internal Assessment (CIA)	: 25 Marks
End Semester Exams (ESE)	: 75 Marks
Total	: 100 Marks

### i) Distribution of Internal Marks

S.No.	Particulars	Distribution of Marks
1	CIA I (2.5 Units) (On completion of 45 <sup>th</sup> working day)	5
2	Model ( All 5 Units) (On completion of 85 <sup>th</sup> working day)	5
3	Attendance	5
4	Library Usage	5
5	Skill Enhancement *	5
<b>Total</b>		<b>25</b>

### Breakup for Attendance Marks:

S.No	Attendance Range	Marks Awarded
1	95% and Above	5
2	90% - 94%	4
3	85% - 89%	3
4	80% - 84%	2
5	75% - 79%	1

#### Note:

Special Cases such as NCC, NSS, Sports, Advanced Learner Course, Summer Fellowship and Medical Conditions etc. the attendance exemption may be given by principal and Mark may be awarded.



## Break up for Library Marks:

S.No	Attendance Range	Marks Awarded
1	10h and above	5
2	9h- less than 10h	4
3	8h - less than 9h	3
4	7h - less than 8h	2
5	6h - less than 7h	1

**Note:**

In exception, the utilization of e-resources of library will be considered.

**\*Components for "Skill Enhancement" may include the following:**

Class Participation, Case Studies Presentation/term paper, Field Study, Field Survey, Group Discussion, Term Paper, Presentation of Papers in Conferences, Industry Visit, Book Review, Journal Review, e-content Creation, Model Preparation, Seminar and assignment.

**Components for Skill Enhancement**

Any one of the following should be selected by the course coordinator

S.No.	Skill Enhancement	Description
1	Class Participation	<ul style="list-style-type: none"> <li>• Engagement in class</li> <li>• Listening Skills</li> <li>• Behaviour</li> </ul>
2	Case Study Presentation/ Term Paper	<ul style="list-style-type: none"> <li>• Identification of the problem</li> <li>• Case Analysis</li> <li>• Effective Solution using creativity/imagination</li> </ul>
3	Field Study	<ul style="list-style-type: none"> <li>• Selection of Topic</li> <li>• Demonstration of Topic</li> <li>• Analysis &amp; Conclusion</li> </ul>
4	Field Survey	<ul style="list-style-type: none"> <li>• Chosen Problem</li> <li>• Design and quality of survey</li> <li>• Analysis of survey</li> </ul>
5	Group Discussion	<ul style="list-style-type: none"> <li>• Communication skills</li> <li>• Subject knowledge</li> <li>• Attitude and way of presentation</li> <li>• Confidence</li> <li>• Listening Skill</li> </ul>
6	Presentation of Papers in Conferences	<ul style="list-style-type: none"> <li>• Sponsored</li> <li>• International/National</li> <li>• Presentation</li> <li>• Report Submission</li> </ul>
7	Industry Visit	<ul style="list-style-type: none"> <li>• Chosen Domain</li> <li>• Quality of the work</li> </ul>



		<ul style="list-style-type: none"> <li>• Analysis of the Report</li> <li>• Presentation</li> </ul>
8	Book Review	<ul style="list-style-type: none"> <li>• Content</li> <li>• Interpretation and Inferences of the text</li> <li>• Supporting Details</li> <li>• Presentation</li> </ul>
9	Journal Review	<ul style="list-style-type: none"> <li>• Analytical Thinking</li> <li>• Interpretation and Inferences</li> <li>• Exploring the perception if chosen genre</li> <li>• Presentation</li> </ul>
10	e-content Creation	<ul style="list-style-type: none"> <li>• Logo/ Tagline</li> <li>• Purpose</li> <li>• Content (Writing, designing and posting in Social Media)</li> <li>• Presentation</li> </ul>
11	Model Preparation	<ul style="list-style-type: none"> <li>• Theme/ Topic</li> <li>• Depth of background Knowledge</li> <li>• Creativity</li> <li>• Presentation</li> </ul>
12	Seminar	<ul style="list-style-type: none"> <li>• Knowledge and Content</li> <li>• Organization</li> <li>• Understanding</li> <li>• Presentation</li> </ul>
13	Assignment	<ul style="list-style-type: none"> <li>• Content and Style</li> <li>• Spelling and Grammar</li> <li>• References</li> </ul>

ii) Distribution of External Marks (ESE)

Total	:	75
Written Exam	:	75

Marks Distribution for Practical course

Total	:	100
Internal	:	40
External	:	60





## i) Distribution of Internals Marks

S.No.	Particulars	Distribution of Marks
1	Experiments/Exercises	15
2	Test 1	10
3	Test 2	10
4	Observation Notebook	05
<b>Total</b>		<b>40</b>

## ii) Distribution of Externals Marks

S.No.	Particulars	External Marks
1	Practical	40
2	Record	10
3	Viva- voce	10
<b>Total</b>		<b>60</b>

Practical examination shall be evaluated jointly by Internal and External Examiners

## Mark Distribution for Project/ Internship/ Industrial Training

<b>Total</b>	<b>:</b>	<b>100</b>
<b>Internal</b>	<b>:</b>	<b>40</b>
<b>External</b>	<b>:</b>	<b>60</b>

## i) Distribution of Internal Marks

S.No.	Particulars	Internal Marks
1	Review I	15
2	Review II	20
3	Attendance	5
<b>Total</b>		<b>40</b>

## ii) Distribution of External Marks

S.No	Particulars	External Marks
1	Project Work /Internship /Industrial training Presentation	40
2	Viva -voce	20
<b>Total</b>		<b>60</b>

Evaluation of Project Work/Internship/ Industrial training shall be done jointly by Internal and External Examiners.



## 7. Credit Transfer

a. Upon successful completion of 1 NPTEL Course (4 Credit Course) recommended by the department, during Semester I to IV, a student shall be eligible to get exemption of one 4 credit course during the V or VI semester. The proposed NPTEL course should cover content/syllabus of exempted core paper in V or VI semester.

S. No.	Course Code	Course Name	Proposed NPTEL Course	Credit
1			Option - 1 Paper title	4
			Option - 2 Paper title	
			Option - 3 Paper title	

b. Upon successful completion of 2 NPTEL Courses (2 Credit each) recommended by the department, during Semester I to IV, a student shall be eligible to get exemption of one 4 credit course during the V or VI semester. Out of 2 NPTEL proposed courses, atleast 1 course should cover content/syllabus of exempted core paper in V or VI semester.

### Mandatory

The exempted core paper in the V or VI semester should be submitted by the students for approval before the end of 4<sup>th</sup> semester

Credit transfer will be decided by equivalence committee

S. No.	Course Code	Course Name	Proposed NPTEL Course	Credit
1			Option - 1 Paper title	2
			Option - 2 Paper title	
			Option - 3 Paper title	
2			Option - 1 Paper title	2
			Option - 2 Paper title	
			Option - 3 Paper title	



NPTEL Courses to be carried out during semester I - IV.					
S.No.	Student Name	Class	Proposed NPTEL Course		Proposed Course for Exemption
			Course I	Option 1- Paper Title Option 2- Paper Title Option 3- Paper Title	Any one Core Paper in V or VI semester
			Course II	Option 1- Paper Title Option 2- Paper Title Option 3- Paper Title	

#### 8. Innovations

Upon Successful outcome of Design Thinking / Copy right/Product/ Patent by the end of the V Semester, student shall be eligible to get exemption in AECC: Innovation, IPR & Entrepreneurship / Innovation & IPR offered during VI Semester.

#### 9. Internship/Industrial Training

Students must undertake industrial / institutional training for a minimum of 15 days during the IV semester summer vacation. The students shall submit the report for evaluation during V semester.

#### 10. Extra Credits: 10

Earning extra credit is not essential for programme completion. Student is entitled to earn extra credit for achievement in Curricular / Co-Curricular/ Extracurricular activities carried out other than the regular class hours.

A student is permitted to earn a maximum of Ten extra Credits during the programme period.

A maximum of 1 credit under each category is permissible.



Dr. NGPASC

COIMBATORE | INDIA

B.Sc. Computer Science with Data Analytics (Students admitted during the AY 2023-24)

Category	Credit
Proficiency in foreign language	1
Proficiency in Hindi	1
Self study Course	1
Typewriting/Short hand	1
CA/ICSI/CMA (Foundations)	1
CA/ICSI/CMA(Inter)	1
Sports and Games	1
Publications / Conference Presentations (Oral/Poster)	1
Lab on Project	1
Innovation / Incubation / Patent / Sponsored Projects / Consultancy	1
Representation in State / National level celebrations	1
Awards/Recognitions/Fellowships	1

Credit shall be awarded for achievements of the student during the period of study only.

#### GUIDELINES

##### Proficiency in foreign language

A pass in any foreign language in the examination conducted by an authorized agency.

##### Proficiency in Hindi

A pass in the Hindi examination conducted by Dakshin Bharat Hindi Prachar Sabha.

Examination passed during the programme period only will be considered for extra credit.

##### Self study Course

A pass in the self study courses offered by the department.

The candidate should register the self study course offered by the department only in the III semester.

##### Typewriting/Short hand

A Pass in short hand /typewriting examination conducted by Tamil Nadu Department of Technical Education (TNDTE) and the credit will be awarded.

##### CA/ICSI/CMA(Foundations)



Dr. NGPASC  
COIMBATORE | INDIA

*B.Sc. Computer Science with Data Analytics(Students admitted during the AY 2023-24)*

Qualifying foundation in CA/ICSI/CMA / etc.

**CA/ICSI/CMA(Inter)**

Qualifying Inter in CA/ICSI/CMA / etc.

**Sports and Games**

Students can earn extra credit based on their achievements in sports in University/ State / National/ International levels.

**Publications / Conference Presentations (Oral/Poster)**

Research Publications in Journals  
oral/poster presentation in Conference

**Lab on Project (LoP)**

To promote the undergraduate research among all the students, the LoP is introduced beyond their regular class hours. LoP is introduced as group project consisting of not more than five members. It consist of four stages namely Literature collection, Identification of Research area, Execution of research and Reporting / Publication of research reports/ product developments. These four stages spread over from III to IV semester.

(Evaluation will be done internally)

**Innovation / Incubation / Patent / Sponsored Projects / Consultancy**

Development of model/ Products /Prototype /Process/App/Registration of Patents/ Copyrights/Trademarks/Sponsored Projects /Consultancy

**Representation in State/ National level celebrations**

State / National level celebrations such as Independence day, Republic day Parade, National Integration camp.

**Awards/Recognitions/Fellowships**

Regional/ State / National level awards/ Recognitions/Fellowships



### GUIDELINES

100 % CIA Courses:

- AECC
- AEEC

S.No	Type of Course
1	Environmental Studies (AECC)
2	Human Rights and Women's Rights, Basic Tamil / Advanced Tamil (AECC)
3	Innovation & IPR/ Innovation, IPR and Entrepreneurship (AECC)
4	Generic Elective (AEEC)

### **Modalities for Implementing Internal Assessment Marks:**

- Student pertaining to 2023 Batch (2023-26) UG programme for the above mentioned courses shall secure a minimum of 40% out of the maximum marks in the continuous internal assessment (CIA) i.e., 20 marks out of 50 marks.
- Students who have not acquired the minimum marks shall be allowed to reappear to improve their marks in the exam components only within the time duration of the programme, in the forthcoming semesters.

### **Distribution of Internal Marks for AECC & AEEC**

S.No.	Particulars	Distribution of Marks
1	CIA I (2.5 Units) (On completion of 45th working day)	15
2	Model ( All 5 Units) (On completion of 85th working day)	15
3	Assignment	05
4	Attendance	05
5	Library Usage	05
6	Skill Enhancement *	05
<b>Total</b>		<b>50</b>



## Distribution of Internal Marks for Generic Elective (AEEC) (Practical)

S.No.	Particulars	Distribution of Marks
1	CIA -I (1-5 Exercise)	5
2	CIA-II (6-10 Exercise)	5
3	Class Participation	10
4	Practical Record	10
5	Test-III & Viva -Voce(10+10)	20
Total		50

## Question paper pattern AECC &amp; AEEC

Test	MARKS	DESCRIPTION	TOTAL	Remarks
CIA Test I 1 Hour First 2.5 Units	50 x 1 = 50 Marks	MCQ	50 Marks	Marks secured will be Converted to 15 marks
CIA test II/ Model test 1 Hour All five Units	50 x 1 = 50 Marks	MCQ	50 Marks	Marks secured will be Converted to 15 marks

Question paper pattern		Total Marks - 50	
<u>Basic Tamil</u>		<u>Advanced Tamil</u>	
Section -A		Section -A	
Choose the correct answer	10x2=20	Choose the correct answer	10x1=10
Section -B		Section -B	
True or false	10x2=20	Fill in the blanks	10x2=20
Section -C		Section -C	
Answer in one page	1x10=10	Write an essay in two pages	2x10=20

Question paper pattern for all other courses falling under Part I to Part III

## CIA I : [1 1/2 Hours-2.5 Units] - 25 Marks

SECTION	MARKS	DESCRIPTION	TOTAL	Remarks
Section - A	8 x 0.5 = 04 Mark	MCQ	25 Mark	Marks secured will be converted To 5 mark
Section - B	3 x 3 = 09 Mark	Answer ALL Questions Either or Type ALL Questions Carry Equal Marks		
Section - C	2 x 6 = 12 Mark			

## CIA II /Model: [3 Hours-5 Units] - 75 Mark

SECTION	MARKS	DESCRIPTION	TOTAL	Remarks
Section - A	10 x 1 = 10 Mark	MCQ	75 Mark	Marks secured will be converted To 5 mark
Section - B	5 x 5 = 25 Mark	Answer ALL Questions (Either or Type Questions) Each Questions Carry Equal Mark		
Section - C	5 x 8 = 40 Mark			

## End Semester Examination: [3 Hours-5 Units] - 75 Mark

SECTION	MARKS	DESCRIPTION	TOTAL
Section - A	10 x 1 = 10 Mark	MCQ	75 Mark
Section - B	5 x 5 = 25 Mark	Answer ALL Questions (Either or Type Questions) Each Questions Carry Equal Mark	
Section - C	5 x 8 = 40 Mark		





Course Code	Course Name	Category	L	T	P	Credit
231TL1A1TA	TAMIL - I	LANGUAGE- I	4	1	-	03

#### PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு நாகரீகம், பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

#### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத் திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத் திறனை ஊக்குவித்தல்	K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓	✓		✓
CO2	✓			✓	
CO3		✓			✓
CO4			✓		
CO5	✓			✓	✓

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input checked="" type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input checked="" type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



231TL1A1TA	TAMIL - I	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

Unit I      மறுமலர்ச்சிக் கவிதைகள்      13 h

1. இலக்கிய வரலாறு      - மறுமலர்ச்சிக் கவிஞர்களின் தமிழ்ப்பணிகள்
2. பாரததேசம்      - பாரதியார்
3. படி      - பாரதிதாசன்
4. தமிழரின் பெருமை      - நாமக்கல் கவிஞர்
5. தமிழ்க் கொலை புரியாதீர்      - புலவர் குழந்தை
6. திரைத்தமிழ்
  - அ) 'விஞ்ஞானத்த வளர்க்கப் போறண்டி' எனத் தொடங்கும் பாடல் - உடுமலை நாராயண கவி
  - ஆ) 'சும்மா கிடந்த நிலத்தை' எனத் தொடங்கும் பாடல் - பட்டுக்கோட்டை கல்யாண சுந்தரனார்
  - இ) 'சமரசம் உலாவும் இடமே' எனத் தொடங்கும் பாடல் - மருதகாசி
  - ஈ) 'உன்னை அறிந்தால்' எனத் தொடங்கும் பாடல் - கண்ணதாசன்

Unit II      புதுக்கவிதைகள்      13 h

1. இலக்கிய வரலாறு      - புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்
2. கடமையைச் செய்      - மீரா
3. மலையாளக் காற்று      - சிற்பி
4. ஒப்பிலாத சமுதாயம்      - அப்துல் ரகுமான்
5. கன்னிமாடம்      - மு.மேத்தா
6. கரிக்கிறது தாய்ப்பால்      - ஆரூர் தமிழ்நாடன்
7. ஐந்தாம் வகுப்பு 'அ' பிரிவு      - நா. முத்துக்குமார்
8. ஹைகூ கவிதைகள்      - 10 கவிதைகள்

Unit III      பெண்ணியம்      09 h

1. தொலைந்து போனேன்      - தாமரை
2. நீரில் அலையும் முகம்      - அ. வெண்ணிலா
3. தற்காத்தல்      - பொன்மணி வைரமுத்து
4. ஏனிந்த வித்தியாசங்கள் ?      - மல்லிகா
5. புதையுண்ட வாழ்க்கை      - சுகந்தி சுப்ரமணியன்



## Unit IV சிறுகதைகள்

15 h

1. இலக்கிய வரலாறு - சிறுகதையின் தோற்றமும் வளர்ச்சியும்
2. கனகாம்பரம் - கு.ப.ராஜகோபாலன்
3. ஆற்றங்கரைப் பிள்ளையார் - புதுமைப்பித்தன்
4. பொம்மை - ஜெயகாந்தன்
5. காய்ச்சமரம் - கி. ராஜநாராயணன்
6. காட்டில் ஒருமான் - அம்பை
7. வேட்கை - சூர்யகாந்தன்

## Unit V பயிற்சிப் பகுதி

10 h

## அ. இலக்கணம்

1. வல்லின ஒற்று மிகும், மிகா இடங்கள் - ஒற்றுப்பிழை நீக்கி எழுதுதல்
2. ர,ற-ல,ழ,ள - ண,ந,ன வேறுபாடு - ஒலிப்பு நெறி, சொற்பொருள் வேறுபாடு அறிதல்)

## ஆ. படைப்பாக்கம்

1. கவிதை - எழுதுதல் (15 வரிகள் முதல் 30 வரிகள் வரை)
2. சிறுகதை - எழுதுதல் (குறைந்தது 3 பக்கங்கள்)

## Text Book

தமிழ் மொழிப்பாடம் - 2022-2023, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி.

- 1 கலை அறிவியல் கல்லூரி, கோயம்புத்தூர் - 641048, வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை - 600 098.

## References

- 1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு - 2014, தமிழ் இலக்கிய வரலாறு - மணிவாசகர் பதிப்பகம், சென்னை - 600 108.
- 2 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு - 2013, இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன் - பூவேந்தன் பதிப்பகம், சென்னை-600 004.
- 3 இணையதள முகவரி: <https://www.tamilvu.org>



Course Code	Course Name	Category	L	T	P	Credit
231TL1A1HA	HINDI - I	LANGUAGE - 1	4	1	-	3

#### PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- The techniques for expansion of ideas and translation process

#### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2		✓			✓
CO3				✓	
CO4	✓		✓		
CO5		✓	✓		✓

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input checked="" type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input checked="" type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



231TL1A1HA	HINDI - I	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

### Syllabus

Unit I	13 h
गद्य - नूतन गद्य संग्रह (जय प्रकाश) पाठ 1- रजियापाठ 2- मक्रीलपाठ 3- बहता पानी निर्मला पाठ 4- राष्ट्रपिता महात्मा गाँधी	
Unit II	13 h
कहानी कुंज- डॉ वी.पी. 'अमिताभ'(पाठ 1-4)	
Unit III	12 h
व्याकरण : शब्द विचार ( संज्ञा, सर्वनाम, विशेषण)	
Unit IV	12 h
अनुच्छेद लेखन	
Unit V	10 h
अनुवाद अभ्यास-III (केवल अंग्रेजी से हिन्दी में) (पाठ 1 to 10)	

### Text Books

- 1 प्रकाशक: सुमित्र प्रकाशन 204 लीला अपार्टमेंट्स, 15 हेस्टिंग्स रोड अशोक नगर इलाहाबाद-211001
- 2 प्रकाशक: गोविन्द प्रकाशन सदर बाजार, मथुरा उत्तरप्रदेश-281001
- 3 पुस्तक: व्याकरण प्रदिप - रामदेव प्रकाशक: हिन्दी भवन 36 टेगोर नगर इलाहाबाद-211024
- 4 पुस्तक: व्याकरण प्रदिप - रामदेव प्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024
- 5 प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई -17



Course Code	Course Name	Category	L	T	P	Credit
231TL1A1MA	MALAYALAM- I	LANGUAGE - I	4	1	-	3

#### PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

#### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Apply creative ability	K3
CO5	Build the power of creative reading	K3

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2					✓
CO3		✓	✓		
CO4	✓			✓	
CO5		✓			✓

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input checked="" type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input checked="" type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



231TL1A1MA	MALAYALAM - I	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

### Syllabus

Unit I	Novel	14 h
	Pathummayude Adu	
Unit II	Novel	10 h
	Pathummayude Adu	
Unit III	Short Story	14 h
	Nalinakanthi	
Unit IV	Short Story	10 h
	Nalinakanthi	
Unit V	Practical Application	12 h
	Expansion of ideas, General Essay and Translation	

### Text Books

- 1 Vaikkam Muhammed Basheer, "Pathummayude Adu" (NOVEL), DC Books & Kottayam
- 2 T.Padmanabhan, "Nalinakanthi" (Short Story), DC Books & Kottayam.

### References

- 1 Malayala Novel Sahithyam.
- 2 Malayala Cherukatha Innale Innu.



Course Code	Course Name	Category	L	T	P	Credit
231TL1A1FA	FRENCH - I	LANGUAGE - I	4	1	-	3

#### PREAMBLE

This course has been designed for students to learn and understand

- the competence in general communication skills with oral, written and comprehension & expression
- the culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire competency in translating simple French sentences into English and vice versa

#### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Select the Plural, Articles and the Hobbies	K2
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K3

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2					✓
CO3					
CO4	✓		✓		✓
CO5	✓		✓		

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input checked="" type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input checked="" type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





231TL1A1FA	FRENCH - I	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

Unit I Salut I Page 10 12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>• Saluer</li> <li>• Enter en contact avec quelqu'un.</li> <li>• Se presenter.</li> <li>• S'excuser</li> </ul>	En cours de cuisine, premiers contacts avec les members d'un groupe	<ul style="list-style-type: none"> <li>• Comprendre des personnes qui se saluent.</li> <li>• Échanger pour entrer en contact, se présenter, saluer, s'excuser.</li> <li>• Communiquer avec <i>tu</i> ou <i>vous</i>.</li> <li>• Comprendre les consignes de classe</li> <li>• Épeler son nom et son prénom.</li> </ul> Computer jusqu'à 10.

Unit II Enchanté I Page 20 12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>• Demander de se presenter.</li> <li>• Présenter quelqu'un.</li> </ul>	Dans la classe de français, se presenter et remplir une fiche pour le professeur.	<ul style="list-style-type: none"> <li>• Comprendre les informations essentielles dans un échange en milieu professionnel.</li> <li>• Échanger pour se presenter et présenter quelqu'un.</li> </ul>

Unit III J'adore I Page 30 12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>• Exprimer ses goûts.</li> </ul>	Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation	<ul style="list-style-type: none"> <li>• Dans une soirée de rencontres rapid comprendre des personnes qui échangent sur elles et sur leurs goût</li> <li>• Comprendre une personne qui parler des goûts de quelqu'un d'autre</li> </ul>



## Unit IV J'adore I Page 30

14 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>Présenter quelqu'un</li> </ul>	Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation	<ul style="list-style-type: none"> <li>Exprimer ses goûts</li> <li>Comprendre une demande laissée sur un répondeur téléphonique.</li> <li>Parler de ses projets de week-end</li> </ul>
Autoévaluation du module I Page 40 – Préparation au DELF A1 page 42		
Demander à quelqu'un de faire quelque chose. Demander poliment. Parler d'actions passées. Tu veux bien?	Organiser un programme d'activités pour accueillir une personne importante	Comprendre une personne demande un service à quelqu'un. Demander à quelqu'un de faire quelque chose. Imaginer et raconter au passé à partir de situations dessinées.

## Unit V Practical Application

10 h

Make in Own Sentences

## Text Book

- 1 Regine Merieux, Yves Loiseau. 2012. LATITUDES - 1: Méthode de français (Page No: 9-55) Les Editions Dider, Paris, Imprime en Roumanie par Canale en Janvier



Dr.NGPASC

COIMBATORE | INDIA

B.Sc. Computer Science with Data Analytics (Students admitted during the AY 2023-24)

Course Code	Course Name	Category	L	T	P	Credit
231EL1A1EA	ENGLISH - I	LANGUAGE- II	4	-	1	3

#### PREAMBLE

This course has been designed for students to learn and understand

- the effect of dialogue, imagery and varied genres
- any spontaneous spoken discourse and respond to them with proper sentence structure
- the transactional concept of English language

#### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the various aspects in poetry	K2
CO2	Infer linguistic and non-linguistic features of the context for understanding and interpreting	K3
CO3	Construct sentences and convey messages effectively in real life situations	K3
CO4	Apply different reading strategies with varying speed	K3
CO5	Prepare modules with their own ideas and present them coherently in a grammatically correct form	K3

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓	✓	✓
CO2		✓			✓
CO3	✓	✓		✓	
CO4			✓		
CO5	✓	✓			✓

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input checked="" type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input checked="" type="checkbox"/>	Innovations
<input checked="" type="checkbox"/>	Intellectual Property Rights	<input checked="" type="checkbox"/>	Gender Sensitization
<input checked="" type="checkbox"/>	Social Awareness/ Environment	<input checked="" type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



231EL1A1EA	ENGLISH-I	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

### Syllabus

#### Unit I Genre Studies 12 h

Nissim Ezekiel: The Worm- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques- Annotations

Niyi Osundare: Our Earth Will Not Die- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques- Annotations

A. G. Gardiner: On Superstitions- Author's biography- Narrative structure- Exploration of the text- passage analysis- insight of ideas- cohesion and context- style- language techniques- Annotation

Nancy Bella: Clever Thief- Author's Biography- Plot Summary- Detailed summary and Analysis- Themes- Important Quotations- Characters- Description - analysis- Terms- Symbols- Critical analysis

H. G. Wells: The Truth about Pycraft- Author's Biography-narrative structure- passage analysis- insight of ideas- cohesion and context- style- language techniques

#### Unit II Listening Skills 12 h

Listening vs. hearing- Types of listening, Tips to enhance Listening Skills, Non-verbal and Verbal signs of active listening - Comprehensive Listening - Listening to pre-recorded audios on speeches, interviews and conversations - Listening Activities- Listening and responding to complaints (formal situation), Listening to problems and offering solutions (informal)

#### Unit III Speaking Skills 14 h

Formal occasions- Introducing oneself, Introducing others, Enquiries and Seeking permission, Making short presentations- Informal occasions- Requests, Offering help, Congratulating, Farewell party, graduation speech- Giving instructions to do a task and to use a device, Giving and asking directions

#### Unit IV Reading Skills 10 h

Study Skills: Skimming and Scanning- Reading different kinds of texts- Types of reading-Developing a good reading speed, reading aloud, Referencing skill - Word



Power (Denotation and Connotation) - Reading comprehension, Data interpretation -Charts, Graphs, Advertisements

**Unit V** Writing Skills 12 h

Sentence patterns, Note- making and note taking-Strategies - Paragraph writing: Structure and Principles - Academic Writing - Formal and Informal Letters, Report, Book /Movie Review

### Text Books

- 1 Gardiner, A. G. 1926. Alpha of the Plough: Second series, J.M. Dent & Sons Ltd., London, United Kingdom. pg.no-151-156. (Unit I)
- 2 Ezekiel, Nissim. "The Worm," Crazy Romantic Love, www.mianmawaisarain.live/2020/05/poem-worm-nissim-ezekiel.html. Accessed 3 Aug. 2022. (Unit I)
- 3 < <http://livros01.livrosgratis.com.br/ln000835.pdf> /> (Unit I)
- 4 Mithra, S. M. 1919. Hindu Tales from the Sanskrit, Macmillan & Co Ltd., London, United Kingdom. pg.no-127-142. (Unit I)
- 5 Nation, I. S. P and Jonathan Newton. 2009. Teaching ESL/EFL Listening and Speaking. Routledge, New York, United States. (Unit II)
- 6 Prabha, Dr. R. Vithya & S. Nithya Devi. 2019. Sparkle. (1st Edn.) McGraw - Hill Education, Chennai, India. (Unit III- V)

### References

- 1 Our Earth Will Not Die By Niyi Osundare." Studocu.Com, studocu.com /in/document/bangalore-university/bachelor-of-computer-applications /1586771577-our-earth-will-not-die/27675462. Accessed 3 Aug. 2022.
- 2 OnSuperstitions."THEHISTORIAN,thehistorian1947.wordpress.com/2019/03/08/on-superstitions-by-a-g-gardiner. Accessed 3 Aug. 2022.
- 3 Swales, John M. & Feak, Christine B. 2012. Academic Writing for Graduate Students: Essential Tasks and Skills, University of Michigan Press, Michigan, United States.
- 4 Rudzka, Brygida -Ostyn, 2003. Word Power: Phrasal Verbs and Compounds: A Cognitive Approach, Mouton de Gruyter, New York, United States.



Course Code	Course Name	Category	L	T	P	Credit
234AI1A1CA	PROBLEM SOLVING AND PROGRAMMING IN C	CORE	4	1	-	4

#### PREAMBLE

This course has been designed for students to learn and understand

- The fundamental aspects of programming and problem solving
- The C language fundamentals
- The representation and working of arrays, pointers, functions and files

#### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Illustrate the basic principles of programming and problem solving	K2
CO2	Understand the fundamentals of C Language	K2
CO3	Implement decision making using branching and looping.	K3
CO4	Develop programs using arrays and functions	K3
CO5	Execute programs using pointers, structures and files	K3

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓		
CO2	✓		✓		
CO3	✓	✓	✓	✓	
CO4	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



234AI1A1CA	PROBLEM SOLVING AND PROGRAMMING IN C	SEMESTER I
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Total Credits: 4

Total Instruction Hours: 60 h

### Syllabus

**Unit I** Introduction to Programming and Problem Solving 12 h

Introduction: Types of Programming Languages – High level Languages – Assembly Languages – Machine Level Languages – System Software – Operating Systems – Compiler – Linker and Interpreter. Problem Solving Strategies: Steps involved in problem solving - Algorithms - Flow Charts - Symbols used in Flow Charts - Pseudo Codes – Structured Programming - Sequence – Selection – Repetition – Modular Programming.

**Unit II** C Language Fundamentals 12 h

Language Fundamentals: Introduction to C - Basic Structure of C Program – Constants – Variables – Data Types - Operators – Expressions – Evaluation of Expressions - Operator Precedence and Associativity - Managing the Input and Output – Formatted I/O – Unformatted I/O – Storage classes- Simple programs for logic building.

**Unit III** Decision Making and Arrays 12 h

Branching: Simple if Statement – if-else statement – elseif Ladder – Switch statement – goto, break and continue statements. Looping: while loop – do-while loop -for loop-nested for loop – Pre-processor Directives: Macro substitution – File inclusion – Compiler control directives. Arrays: Introduction – Types of arrays – Declaration and Initialization of Arrays – Dynamic Arrays.

**Unit IV** Strings, Functions and Pointers 12 h

Strings: Declaring and Initializing the string variables – String handling functions. Functions – Need for functions – Elements of functions – Category of functions – Passing arrays to functions - Recursion. Pointers: Understanding Pointers – Declaration and Initialization of pointer variables – Accessing variables through pointers – Pointers and arrays.



**Unit V** Structures and Files

12 h

Structures: Defining a structure - Declaring structure variables - Accessing structure member - Array of structures - Structure within structures - Unions. Files: Defining and opening a File - Closing a file - I/O Operations on files - Dynamic memory allocation - Command Line Arguments.

**Text Books**

- 1 Ashok N. Kamthane, 2009, "Programming and Data Structures", 1st Edition, Pearson Education.
- 2 Byron Gottfried, 2018, "Schaum's Outline of Programming with C", 4th Edition, McGraw Hill Education.

**References**

- 1 E. Balagurusamy, 2017, "Programming in ANSI C", 7th Edition TMH.
- 2 H. Schildt, 2000, "C: The Complete Reference", 4th Edition, TMH.
- 3 Reema Thareja, 2015, "Programming in C", 2nd Edition, Oxford University Press.
- 4 Anita Goel, Ajay Mittal, 2016, "Computer Fundamentals and Programming in C", 1st Edition, Pearson.





234DA1A1CP	CORE PRACTICAL : C PROGRAMMING	SEMESTER I
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Total Credits: 2  
Total Instructions Hours: 48h

S.No	List of Programs
1	Simple Program to understand the concepts of data types
2	Program to get familiarity on using conditional statements
3	Program to implement patterns
4	Program to perform matrix and Dynamic Array operations
5	Program to Work with pointers
6	Program to implement functions
7	Program to perform recursion
8	Program to create and implement String manipulation
9	Program to test dynamic Memory Allocations
10	Program to implement structures
11	Program to perform union and enumerated Data types
12	Application Program using File operations

**Note:** Out of 12 programs 10 Mandatory



Course Code	Course Name	Category	L	T	P	Credit
234IT1A1CA	DIGITAL COMPUTER FUNDAMENTALS	CORE	4	-	-	4

#### PREAMBLE

This course has been designed for students to learn and understand

- The concepts of number system and circuits
- The principles of logic gates and memory
- The design and architecture of microprocessors and microcontrollers

#### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the types of number systems, Boolean Algebra	K2
CO2	Understand and analyze Logic gates	K2
CO3	Illustrate the concepts of combinational circuits	K3
CO4	Understand the different types of sequential logic and memory organization	K2
CO5	Understand the architecture of microprocessors and microcontrollers	K2

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓		
CO2	✓		✓	✓	
CO3	✓	✓	✓	✓	
CO4	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



234IT1A1CA	DIGITAL COMPUTER FUNDAMENTALS	SEMESTER I
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Total Credits: 4

Total Instruction Hours: 48 h

### Syllabus

**Unit I** Binary Systems and Boolean Algebra 10 h

Binary Numbers- Number base conversions- Octal and Hexadecimal conversions- Complements- Binary codes - Decimal codes.

Basic Definitions-Boolean functions- Canonical standard forms: Minterms and Maxterms - Sum of Minterms-Product of Maxterms-conversion between canonical forms.

**Unit II** Logic Gates and Boolean functions 8 h

Digital Logic Gates: AND, OR, Inverter, Buffer, NAND, NOT, Exclusive-OR, Exclusive-NOR.

The Map method-Two and three-variable Maps-Four variable Map - Five and Six-Variable Maps- Product of Sum simplification - Don't care conditions.

**Unit III** Combinational Logic 10 h

Adders: Half-Adder, Full-Adder. Subtractors Half-Subtractor, Full-Subtractor. Multilevel NAND Circuits: Universal Gate. Multilevel NOR Circuits: Universal Gate. Binary Parallel Adder- Decimal Adder - BCD Adder. Decoders: Demultiplexers- Encoders - Multiplexer.

**Unit IV** Sequential Logic & Memory Unit 10 h

Introduction- Flip-flops-Clocked RS Flip-flop - D Flip-flop - JK Flip-flop - Design of Counters- Registers -Ripple Counters.

The Memory Unit - Random Access Memories: Integrated-circuit Memory- Magnetic-core Memory.

**Unit V** Introduction to Microprocessors and Microcontrollers 10 h

Introduction - Microprocessor- Microcomputer- Architecture of Microprocessors- History- Evolution- Microprocessor Applications- Evolution of Microcontrollers- Application of Microcontrollers. Architecture of 8085 Microprocessor- Pin diagram of 8085 Microprocessor.



## Text Books

- 1 M.Morris Mano, 2019, "Digital Logic and Computer Design", Pearson India Education.
- 2 Soumitra Kumar Mandal, 2018, "Microprocessors and Microcontrollers - Architecture, Programming and Interfacing using 8085, 8086, 8051", 15<sup>th</sup> Edition, Tata Mc Graw Hill Education.

## References

- 1 S. Salivahanan and S Arivazhagan, 2018, "Digital Circuits and Design", 5th Edition, Oxford University Press, Noida
- 2 Thomas Floyd L., 2015, "Digital Fundamentals", 11th Edition, Pearson Publication Ltd, New Delhi
- 3 M Morris Mano, 2016, " Digital Logic and Computer Design", 5th edition, Pearson
- 4 Aditya P Mathur, 2016, "Introduction to Microprocessor", 3rd Edition, McGraw Hill Education.



Course Code	Course Name	Category	L	T	P	Credit
232MT1A1ID	MATHEMATICS FOR COMPUTING-I	IDC	4	1	-	4

#### PREAMBLE

This course has been designed for students to learn and understand

- the concepts of matrices and determinants
- the technique of obtaining eigen values and eigen vectors
- the method of solving linear system of equations

#### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	define the various terms of matrices and the operations involved in it	K1
CO2	identify the determinant value of matrices	K2
CO3	determine the eigen values and eigen vectors through different methods	K3
CO4	recognize the direct and indirect methods for solving algebraic equations	K1
CO5	discuss the method of solving differential and integral problems	K2

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	
CO2	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	
CO4	✓	✓	✓		
CO5	✓	✓	✓		

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



232MT1A1ID	MATHEMATICS FOR COMPUTING-I	SEMESTER I
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Total Credits: 4

Total Instruction Hours: 60 h

### Syllabus

**Unit I** Systems of Linear Equations 13 h

Introduction to system of linear equations- - linear systems in two and three unknown - augmented matrices and elementary row operations - Gaussian elimination- Matrices and Matrix operations - inverses - algebraic properties of matrices - elementary matrices - method for finding  $A^{-1}$ - invertible matrices - diagonal matrices - triangular matrices - symmetric matrices

**Unit II** Determinants 12 h

Introduction - determinants by cofactor expansion- minors and cofactors - technique for evaluating  $2 \times 2$  and  $3 \times 3$  determinants - evaluating determinants by row reduction - elementary row operations - Matrices with proportional rows or columns - properties of determinants - Cramer's rule.

**Unit III** Eigenvalues and Eigenvectors 10 h

Definition of eigenvalues and eigenvectors - computing eigenvalues and eigenvectors - Diagonalization - Geometric and Algebraic multiplicity - complex vector spaces - vectors in  $C^n$  - differential equations - first order linear systems - solution by diagonalization

**Unit IV** Solution of Algebraic , Transcendental and Linear Systems of Equations 13 h

Introduction - Newton-Raphson method-Direct methods -Matrix inversion method-Gaussian elimination method - Gauss Jordan method Iterative methods - Gauss Seidel Method - Gauss Jacobi method

**Unit V** Interpolation, Numerical Differentiation and Integration 12 h

Introduction - Finite differences - Newton's formulae for interpolation - Interpolation with unevenly spaced points: Lagrange's interpolation formula-Numerical differentiation - maximum and minimum values of a tabulated Function - Numerical integration - Trapezoidal rule - Simpson's 1/3 Rule - Simpson's 3/8 Rule.



### Text Books

- 1 Howard Anton and Chris Rorres, 2015 "Elementary Linear Algebra with Supplemental Applications", 11th Edition, Wiley India Pvt. Ltd, New Delhi. (Unit I to III)
- 2 Sastry, S.S, 2012, "Introductory methods of Numerical Analysis", Prentice-Hall of India. New Delhi. (Unit IV to V)

### References

- 1 Partha Karmakar, Chandan Bikash Das, Pabitra kumar Gouri, 2021 "Introduction to Linear Algebra", 1st Edition, Books and Allied(P) Ltd, Kolkata
- 2 Gilbert Strang, 2005, "Linear Algebra and its Applications", 4th Edition, Brooks/Cole, Noida.
- 3 Veerarajan.T, Ramachandran.T, 2004, "Theory and Problems in Numerical Methods With Programs in C and C++", 10th Edition, Tata Mc- Graw Hill Publishing Company Limited, New Delhi.
- 4 Venkataraman,M.K. 2004, "Numerical Methods in Science and Engineering", 4th Edition, NPC



Course Code	Course Name	Category	L	T	P	Credit
233MB1A1AA	ENVIRONMENTAL STUDIES	AECC	2	-	-	2

#### PREAMBLE

This course has been designed for students to learn and understand

- Multi disciplinary aspects of Environmental studies
- Importance to conserve the Biodiversity
- Causes of Pollution and its control

#### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the importance of natural resources in order to conserve for the future.	K2
CO2	Infer on Natural resources and its conservation	K2
CO3	Apply the knowledge on Biodiversity and its conservation	K3
CO4	Relate effects, causes and control of air, water, soil and noise pollution etc.,	K2
CO5	Build awareness about sustainable development and Environmental protection	K2

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1					✓
CO2					✓
CO3					✓
CO4					✓
CO5					✓

#### COURSE FOCUSES ON

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





233MB1A1AA	ENVIRONMENTAL STUDIES	SEMESTER I
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Total Credits: 2

Total Instruction Hours: 24 h

### Syllabus

**Unit I** Introduction to Environmental studies & Ecosystems 5 h

Introduction to Environmental studies & Ecosystems: Multidisciplinary nature of environmental studies; components of environment - atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance; Concept of sustainability and sustainable development. Ecosystem- Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession.

**Unit II** Natural Resources: Renewable and Non-renewable Resources 5 h

Natural Resources: Renewable and Non-renewable Resources: Land Resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Water: Use and overexploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs.

**Unit III** Biodiversity and Conservation 5 h

Biodiversity and Conservation: Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot spots. India as a mega-biodiversity nation; Endangered and endemic species of India. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

**Unit IV** Environmental Pollution, Environmental Policies & Practices 5 h

Environmental Pollution, Environmental Policies & Practices: Environmental pollution: types, causes, effects and controls; Air, water, soil, chemical and noise pollution. Nuclear hazards and human health risks. Solid waste management: Control measures of urban and industrial waste. Pollution case studies. Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment Laws: Environment Protection Act; Prevention & Control of Pollution Act - Air & Water. Wildlife Protection Act; Forest Conservation Act;

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B.Sc. Computer Science with Data Analytics (Students admitted during the AY 2023-24)



**Unit V** Human Communities and the Environment & Field Work 4 h

Human Communities and the Environment & Field Work: Human population and growth: Impacts on environment, human health and welfares. Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness. Visit to an area to document environmental assets; river/forest/flora/fauna, etc. Population explosion – Family Welfare Programmes. Role of Information Technology in Environment and human health. Role of the Colleges, Teachers and Students in village adoption towards clean, green and make in villages in various aspects.

**Text Books**

- 1 Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
- 2 Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.

**References**


- 1 Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge
- 2 Gleick, P.H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press
- 3 Groom, Martha J. Gary K. Meffe, and Carl Ronald carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006
- 4 Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.
- 5 McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29-64). Zed Books
- 6 McNeil, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century
- 7 Odum, E.P., Odum, h.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.

*W.D. Saha*  
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Coimbatore – 641 048



Dr. N.G.P.A.S.C

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 <b>Dr. N.G.P. Arts and Science College</b>		
<b>APPROVED</b>		
BoS- 8th 09.06.23	AC- 15th 14.07.23	GB- 20th 05.08.23

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