KG COLLEGE OF ARTS AND SCIENCE

Autonomous Institution | Affiliated to Bharathiar University
Accredited with A++ Grade by NAAC
ISO 9001:2015 Certified Institution
KGiSL Campus, Saravanampatti, Coimbatore – 641 035

Regulations 2025 -26 for Undergraduate Programme

**Learning Outcomes Based Curriculum Framework- (LOCF) model with
Choice Based Credit System (CBCS)**

Programme: B.Sc. Computer Science (AI&DS)
Programme Code: BAI

(Applicable for the Students admitted during the Academic Year 2025 - 26 onwards)

Eligibility

The Student should have passed Higher Secondary Examination and wherever the students have not studied mathematics knowledge be imparted through Residential/Bridge Course.
(As per the eligibility condition given Ref. BU/R/B3-B4/Eligibility Condition/2025/7960
dated 08/05/2025).

Program Learning Outcomes (PLOs)

The successful completion of B.Sc. CS (AI & DS) Programme shall enable the students to:

PLO1	Graduates in Artificial Intelligence and Data Science should be able to develop AI-based and domain-specific processes for efficient decision making in a variety of domains, including business and governance.
PLO2	Solve complicated issues, apply the technical and analytical abilities found in the fields of data science and artificial intelligence.
PLO3	Develop and create, choose, implement, and manage complex societal issues by combining real-world industrial tools and processes with theoretical understanding of AI and Data Analytics.
PLO4	Understand the need of continuing education independently throughout life, and possess the skills necessary to do so in the present context of technological development and meet society's most pressing demands.
PLO5	Recognize the effects of expert technical solutions in social and environmental contexts and exhibit a consciousness of the necessity of environmentally friendly growth. Utilize moral precepts and make a commitment to professional responsibilities, ethics, and technological norms in new business ventures and hospitality industries.

B.Sc. Computer Science (Artificial Intelligence & Data Science)
Distribution of Credits and Hours for all the Semesters

Part	Course Category	No. of. Courses	Hrs.		Credits		Total		Semester
I	Language – I	4	4 X 4	16	4 X 3	12	12		1 – 4
II	Language – II	4	4 X 4	16	4 X 3	12	12		1 – 4
III	Core Theory (6 hrs/Week)	4	4 X 6	24	4 X 4	16			3,6
	Core Theory (5 hrs/Week)	9	9 X 5	45	9 X 4	36			1,2,4,5
	Core Lab (4 hrs/Week)	4	4 X 4	16	4 X 2	8			1 – 4
	Core Lab (5 hrs/Week)	3	3 X 5	15	3 X 3	9			5,6
	Allied	4	4 X 4	16	4 X 3	12			1 – 4
	Electives	2	2 X 5	10	2 X 3	6			5,6
	Project	1	1 X 6	6	1 X 5	5			6
	Internship (IT)	1	-	-	1 X 2	2			5
	Skill Enhancement (SEC)	3	3 X 2	6	3 X 2	6			3, 4, 6
IV	Foundation Course (FC)	2	2 X 2	4	3 X 2	6			1 - 2
	Foundation Course (FC)	1	-	-	2 X 2	4			3
	Ability Enhancement Compulsory Course (AECC)	3	3 X 2	6	3 X 2	6	14		1, 2, 4
	Ability Enhancement Compulsory Course (AECC) - Online Course - MOOC	1	-	-	1 X 2	2			3
V	Liberal Arts (Extra-curricular and Co- curricular)	-	-	-	2	2	2		4
	Total	**46**		**180**			**140**	**140**	

Consolidated Semester wise and Component wise
Hours and Credits Distribution

Semester	Part I		Part II		Part III		Part IV		Part V		Total	
	Hrs.	Credits	Hrs.	Credits	Hrs.	Credits	Hrs.	Credits	Hrs.	Credits	**Hrs.**	**Credits**
1	4	3	4	3	18	13	4	4	-	-	**30**	**23**
2	4	3	4	3	18	13	4	4	-	-	**30**	**23**
3	4	3	4	3	22	15	-	4	-	-	**30**	**25**
4	4	3	4	3	20	15	2	2	-	2	**30**	**25**
5	-	-	-	-	30	23	-	-	-	-	**30**	**23**
6	-	-	-	-	30	21	-	-	-	-	**30**	**21**
Total	**16**	**12**	**16**	**12**	**138**	**100**	**10**	**14**	**-**	**2**	**180**	**140**

Semester 1

Curriculum

B.Sc. Computer Science (Artificial Intelligence & Data Science)

						Examination			
Semester – 1									
Course Code	Part	Course Category	Course Name	Hrs. / Week	Duration in hrs.	Max Marks			Credits
						CIA	ESE	Total	
25TAM11L	I	Language-I	Tamil-I	4	3	25	75	100	3
25HIN11L	I		Hindi-I						
25FRE11L	I		Malayalam-I						
25MAL11L	I		French-I						
25ENG12L	II	Language-II	English-I	4	3	25	75	100	3
25BAI13C	III	Core – I	Python Programming	5	3	25	75	100	4
25BAI14P	III	Core Lab – I	**Lab:** Python Programming	4	3	40	60	100	2
25BAI15C	III	Core – II	Data Literacy & Fundamentals of Data Science	5	3	25	75	100	4
25BAI16A	III	Allied – I	Linear Algebra and Discrete Mathematics	4	3	25	75	100	3
25ENV1FC	IV	FC – I	Environmental Studies	2	2	50	-	50	2
25SOF1AE	IV	AECC – I	Soft Skills	2	2	-	50	50	2
			Total	**30**				**700**	**23**

Curriculum

B.Sc. Computer Science (Artificial Intelligence & Data Science)

Course Code	Course Name	Category	Hours / Week	Credits
25TAM11L	Tamil - I	Language – I	4	3

Course Objectives

- இலக்கிய வளர்ச்சியை அறிந்து கொள்ளுதல்
- இலக்கியம் படைக்கும் திறன்
- இலக்கிய இலக்கண உரைசெய்தல்
- திறனாய்வு முறையினைக் கற்றுத்தேர்தல்

Course Learning Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	புதுக்கவிதையின் மூலம் வாழ்வியல் விழுமியங்களை உணர்ந்து கொள்ளுதல்.	K1, K2
CLO2	சிறந்த மற்றும் வாழும் கவிஞர்களை அறிந்து கொள்ளுதல்.	K2, K3
CLO3	சிறந்த படைப்பாளர்களின் சிறுகதையில் வெளிப்படும் சமூகச் சிந்தனைகளை அறிந்து விழிப்புணர்வைப் பெறுதல்.	K3
CLO4	தற்கால இலக்கியங்களான புதுக்கவிதை, சிறுகதை தோன்றி வளர்ந்த பின்புலத்தை அறிதல்.	K1, K3
CLO5	மொழியைப் பிழையின்றி பேச எழுத கற்கத் தேவையான தமிழ் இலக்கணத்தின் இன்றியமையாமையை உணர்தல். நடைமுறை வாழ்வியலுக்குத் தேவைப்படும் ஆங்கிலக் கடிதத்தைத் தமிழாக்கம் செய்தலுக்கான பயிற்சி அடைதல்.	K2, K3
K1 - Remember; **K2** - Understand; **K3** - Apply		

Part – I: Tamil – I

Unit	Content	No. of Hours
I	**நாட்டுப்பற்று** 1. உலகத்தை நோக்கி வினவுதல் - பாரதியார் 2. பாரதிதாசன் கவிதைகள் - பாரதிதாசன் • தமிழ்ப்பேறு 3. ஒற்றுமையே உயிர்நிலை - நாமக்கல் கவிஞர் 4. தேவதேவன் கவிதைகள் -தேவதேவன் • சாலையும் மரங்களும் செருப்பும் • புதிய வீடு 5. ஆலாபனை - கவிக்கோ அப்துல் ரகுமான் • போட்டி • பாதை 6. புத்தகச் சந்தை -கவிஞர் வாலி	14
II	**சமூகம்** 1. எட்டாவது சீர்........ - ஈரோடு தமிழன்பன் 2. தொலைந்து போனேன் - கவிஞர் தாமரை 3. திருநங்கைகள் காகிதப் பூக்கள் - நா. காமராசன் 4. மரங்களைப் பாடுவேன் - வைரமுத்து 5. புள்ளிப் பூக்கள் (ஹைக்கூ) - அமுத பாரதி 6. நாட்டுப்புறப் பாடல்கள் (தாலாட்டுப் பாடல் , தெம்மாங்குப் பாடல் , உழவுத்தொழில்)	14
III	**சிறுகதை** 1. காஞ்சனை - புதுமைப்பித்தன் 2. சுமைதாங்கி - ஜெயகாந்தன் 3. சோற்றுக் கணக்கு - ஜெயமோகன் 4. ஆறு யானைகள் - எஸ்.ராமகிருஷ்ணன் 5. மரத்தைக் கர்ப்பம் சுமந்தவள் - ஆண்டாள் பிரியதர்சினி	12

Unit	Content	No. of Hours
IV	**இலக்கிய வரலாறு** 1. மரபுக்கவிதையின் தோற்றமும் வளர்ச்சியும் 2. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் 3. ஹைக்கூ கவிதையின் தோற்றமும் வளர்ச்சியும் 4. சிறுகதையின் தோற்றமும் வளர்ச்சியும்	10
V	**இலக்கணம்** 1. எழுத்துகள் (முதல் எழுத்துகள், சார்பெழுத்துகள்) 2. எழுத்துக்களின் பிறப்பு 3. மாத்திரைகள் 4. பயிற்சிக்குரியன - மொழிபெயர்ப்பு (ஆங்கிலத்திலிருந்து தமிழுக்கு மொழிபெயர்த்தல்)	10
	Total Hours	**60**

	Reference Books
1	பேரா. குருசாமி, ம.ரா.போ. (2014), பாரதி பாடல்கள், ஆய்வுப் பாதிப்பு, , தமிழ்ப் பல்கலைக் கழகம், தஞ்சாவூர்.
2	அப்துல் ரகுமான்,(2000), ஆலாபனை, கவிக்கோ பதிப்பகம்
3	தாமரை கவிதைகள், (2012), நியூ செஞ்சுரி புக் ஹவுஸ்
4	வரதராசனார் மு, (2021), தமிழ் இலக்கிய வரலாறு, சாகித்ய அகாடமி பதிப்பு.
5	முனைவர் பஞ்சாங்கம் கா, (2017), தமிழ் இலக்கிய வரலாறு, காவ்யா பதிப்பகம்.
6	முனைவர் வேங்கடராமன் கா. கோ (2008), தமிழ் இலக்கிய வரலாறு, கலையக வெளியீடு.
7	பரந்தாமனார் அ.கி. (2002), நல்ல தமிழ் எழுத வேண்டுமா?, அல்லி நிலையம்.
8	ராமகிருஷ்ணன் எஸ் (2006), 100 சிறந்த சிறுகதைகள் (தொகுதி 1 & 2) பதிப்பகம்: தேசாந்திரி பதிப்பகம்
9.	குமரன் கோ (2010), தமிழ் இலக்கணம் எளிய அறிமுகம் , சந்தியா பதிப்பகம்
10.	சக்திவேல் சு,(2012), நாட்டுப்புறவியல், மணிவாசகர் பதிப்பகம்

Course Code	Course Name	Category	Hours / Week	Credits
25HIN11L	**Hindi – I**	**Language – I**	**4**	**3**

Course Objectives:

- Improves grammatical knowledge
- Will continue to read and learn about articles and think about them
- It is possible to read and understand short stories and understand the thoughts and life of the people of this state
- Translation knowledge and the ability to read and analyze a message are also available

Course Learning Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	Understand the text styles and grammatical elements	K1, K2
CLO2	Discuss the content of a reading passage	K2, K3
CLO3	Develop an interest in the appreciation of short stories	K3
CLO4	Comprehend the grammatical structures and sentence making	K1, K3
CLO5	Understand the language and developing English to Hindi translation skill	K2, K3
K1 - Remember; **K2**-Understand;**K3**-Apply		

Part – I: Hindi – I

Unit	Content	Hours
I	**Prose : Nuthan Gadya Sangrah** Lesson 1 – Bharathiya Sanskurthi - Dr.Rajendra Prsad Lesson 3 – Razia - Ramaviksha Benipuri Lesson 4 – Makreal - Yespal Lesson 5 – Bahtha Pani Nirmala -'Ageya' Lesson 6 – Rashtrapitha Mahathma Gandhi -Mukthibodh Lesson 9 – Ninda Ras - Harishankar Parsayi.	14
II	**Non Detailed Text Short Stories: Kahani Kunj** Pareksha - Premchand Mamtha - Jayashankar Prasad Apna paraya - Jaynendrakumar Admi ka bachcha - Yespal Bolaram ka jeev - Harishankar Parsayi Vapasi - Mannu Bhandari	14
III	**Grammar: Shabdha Vichar Only** (Noun, Pronoun, Adjective, Verb, Tense, Case, Endings) Theoretical & Applied.	12
IV	**Translation: English – Hindi Only.** Anuvadh Abhyas – Iii (1-15 Lessons Only)	10
V	**Comprehension**: 1 Passage From Anuvadh Abhyas–III (16-30)	10
	Total Hours	60

	Text Books
1	Jayaprakash, (2009), Nuthan Gadya Sangrah, Publisher : Sumitra Prakashan Sumitravas, 16/4, Hastings Road, Allahabad – 211001.
2	Amithab. V.P. (2011), Kahani Kunj, Publisher : Govind Prakashan Sadhar Bagaar, Mathura, Uttar Pradesh,–281 001

Course Code	Course Name	Category	Hours / Week	Credits
25MAL11L	**Malayalam - I**	**Language – I**	**4**	**3**

Course Objectives

- Improves grammatical knowledge
- Will continue to read and learn about articles and think about them
- It is possible to read and understand short stories and understand the thoughts and life of the people of this state
- Translation knowledge and the ability to read and analyze a message are also available
- Translation knowledge and the ability to read and analyze a message are also

Course Learning Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	Understand the text styles and grammatical elements	K1
CLO2	Discuss the content of a reading passage	K1
CLO3	Develop an interest in the appreciation of short stories	K2
CLO4	Comprehend the grammatical structures and sentence making	K3
CLO5	Understand the language and developing English to Malayalam translation skill	K4
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4**-Analyse		

Part – I – Malayalam

Unit	Content	Hours
I	Novel – Pathummayude Aadu - Vaikam Muhammed Basheer.	14
II	Novel- - Pathummayude Aadu - Vaikam Muhammed Basheer.	14
III	Short Story - Ente Priyappeta Kadhakal – Akbar Kakkattil).	12
IV	Short Story - Ente Priyappeta Kadhakal – Akbar Kakkattil)	10
V	Composition &Translation(English to Malayalam)	10
	Total Hours	**60**

Text Books	
1	Vaikam Muhammed Basheer, (2012), Novel- PathummayudeAadu, D.C.Books, Kottayam, Kerala
2	Akbar Kakkattil, (2009), Short Story - Ente Priyappeta Kadhakal
Reference Books	
1	Tharakan K.M , (2016), Malayala Novel SahithyaCharitram, N.B.S.Kottayam.
2	Achuyuthan M, (2014), Cherukatha Innale Innu-M.Achuyuthan D.C Books, Kottayam.
3	Dr George K.M,(2011) Sahithya CharitramPrasthanangalilude, D.C.Books Kottayam.
4	Sukumar Azheekode, (2015), Malayala Sahithyavimarsam, D.C.Books

Course Code	Course Name	Category	Hours / Week	Credits
25FRE11L	**French - I**	**Language – I**	**4**	**3**

Course Objectives:

To understand, speak, read and write simple, standard speech which is very slow and is carefully articulated and can recognize familiar words and very basic phrases concerning themselves, their family and immediate concrete surroundings when people speak slowly and clearly.

Course Outcomes:

CLO	Course Outcome	Knowledge Level
CLO1	Comprehend basic vocabulary	K1
CLO2	Understand basic syntax and grammar patterns	K2
CLO3	Converse slowly in known situations	K2
CLO4	Translate small basic sentences	K3
K1 - Remember; K2 - Understand; K3 - Apply		

Part – I: French – I

Unit	Content	Hours
I	Etape 0	14
	Etape1 (Lecons 1 - 3)	
II	Etape2 (Lecons 1 - 3)	14
III	Etape 3 - Leçons 1 - 2	12
IV	Etape 3 – Leçon 3	10
	Etape 4 – Leçon 1	
V	Etape 4 – Leçons 2 - 3	10
Total		**60**

Text Book	
1	Céline Himber, Corina Brillant, Sophie Erlich, (2008), Adomania 1 – Methode de francais, Publisher - Hachette Fle.
Reference Book	
1	Yves Loiseau, Régine, (2014), Latitudes 1, Merieux Publisher: French and European Publications Inc.

Part – II: English -I

Course Code	Course Name	Category	Hours /Week	Credits
25ENG12L	**English - I**	**Language II**	**4**	**3**

Course Objectives

The course intends to cover
- Various genres of literature.
- Active and passive vocabulary.
- Usage of Grammar and Communication.

Course Learning Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	Identify aesthetic sense and appreciate poetry, enhancing creativity and understanding relevant to professional environments.	K1
CLO2	Understand diverse styles of prose, facilitating versatility in writing and inculcating interpersonal skills	K2
CLO3	Apply the characters and the narrative techniques in creative writing and content creation ethically.	K3
CLO4	Employ vocabulary and grammatical proficiency in communication to enhance clarity in workplace interactions.	K3
CLO5	Enhance overall communication competence. Practicing these skills in combination reinforces learning and provides students with opportunities to use the language in authentic contexts.	K3
K1 - Remember**; K2 -** Understand**; K3 -** Apply		

Part - II: English – I

Unit	Content	No. of Hours
I	**Poetry : Nature** 1. I Wandered Lonely as a Cloud - William Wordsworth 2. The Sparrow - Paul Laurence Dunbar 3. Stopping by woods on a snowy Evening – Robert Frost	12
II	**Prose : Friendship** 1. The Man in Black - Oliver Goldsmith 2. Of Friendship - Francis Bacon 3. The Blessing of Friends - Sir John Lubbock	12
III	**Short Stories: Morality** 1. The Necklace – Guy de Maupassant 2. The Lottery - Shirley Jackson 3. The Monkey's Paw - W. W. Jacobs	12
IV	**Language Competency** 1. Vocabulary : Synonyms, Antonyms, Word Formation 2. Parts of Speech 3. Error correction	12
V	**English for Communication** 1. Listening for General and Specific Information. 2. Self - Introduction, Introducing others, Greetings. 3. Reading a prose passage, Reading a poem and Reading a short story 4. Descriptive writing – Writing a short descriptive essay of two to three paragraphs.	12
	Total Hours	**60**

Text Books

1.	Zama, M. (2004). Poetry Down the Ages. Orient Blackswan.
2.	Goldsmith, O. (1869). The Works of Oliver Goldsmith. J. Dicks
3.	Bacon, F., & Montagu, B. (1857). The Works of Francis Bacon (Vol. 1). Parry & McMillan.

Reference Books

1.	Kumar,V. T. Bhavani, Durga.K. Srinivas.YL. (2018). English in use - A textbook for College Students. (English, Paperback).
2.	Swan, M. (2005). Practical English usage (Vol. 7). Oxford: Oxford university press.

Web Resources (Swayam / NPTEL)

1.	**https://nptel.ac.in/courses/109105205**

Course Code	Course Name	Category	Hours / Week	Credits
25BAI13C	**Python Programming**	**Core - I**	5	4

Course Objectives

The course intends to cover

- Core syntax and semantics of Python programming language.
- Process of structuring the data using lists, dictionaries, tuples and sets.

Course Learning Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	Remember the fundamentals of solving problems with computers and execute simple Python programs.	K1
CLO2	Learn the Basic Programming constructs in Python.	K2
CLO3	Understand the basic functions in Python Programming.	K2
CLO4	Apply Software Objects and databases in Python.	K3
CLO5	Apply OOPs concepts in Python programs.	K3
K1 - Remember; **K2** - Understand; **K3** - Apply;		

CLO – PLO Mapping

CLOs/PLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	3	3	1	1	1
CLO2	3	3	2	1	1
CLO3	3	2	2	2	1
CLO4	3	2	2	2	1
CLO5	3	2	2	2	1
3 - Substantial (high)		**2** - Moderate (medium)		**1** - Slight (low)	

Core - I : Python Programming

Unit	Content	No. of Hours
I	**Introduction:** The essence of computational problem solving – Limits of computational problem solving - Computer Algorithms - Computer Hardware - Computer Software - process of computational problem solving - Python programming language - Literals - Variables and Identifiers - Operators - Expressions and Data types, Input / Output.	15
II	**Control Structures:** Boolean Expressions - Selection Control - If Statement Indentation in Python - Multi-Way Selection - Iterative Control - While Statement- Infinite loops - Definite vs. Indefinite Loops - Boolean Flag. String, List, Tuple, Manipulations. Building blocks of Python programs, Understanding and using range-Slicing	15
III	**Functions:** Program Routines- Defining Functions- More on Functions : Calling Value - Returning Functions - Calling Non-Value – Returning Functions- Parameter Passing - Keyword Arguments in Python – Default Arguments in Python-Variable Scope. **Recursion:** Recursive Functions. Decorators. **Modular Design** : Modules - Top-Down Design - Python Modules**.**	15
IV	**Objects and their use**: Software Objects - Turtle Graphics – Turtle Attributes. **Text Files:** Opening, reading and writing text files. **Database Programming:** Connecting to a database, **C**reating Tables, **R**ead, **U**pdate, **D**elete (CRUD) and Insert operations, Transaction Control, Disconnecting from a database, String Processing – Exception Handling.	15
V	**Dictionaries and Sets**: Dictionary type in Python - Set Data type. **Object Oriented Programming using Python**: Encapsulation - Inheritance – Polymorphism. **Python packages:** Simple programs using the built-in functions of packages matplotlib, numpy, pandas etc.	15
	Total Hours	**75**

Text Books

1.	Charles Dierbach (2022), Introduction to Computer Science using Python - A Computational Problem solving Focus, Wiley India Edition. (Unit – I, II, III, IV)
2	Wesley J. Chun (2016), Core Python Applications Programming, 3rd Edition, Pearson Education. (Unit – V)

Reference Books

1.	Mark Lutz (2018), Learning Python Powerful Object Oriented Programming, O‟Reilly Media, 5th Edition.
2.	Timothy A. Budd (2011), Exploring Python, Tata MCGraw Hill Education Private Limited, 1st Edition.
3.	John Zelle (2016), Python Programming: An Introduction to Computer Science, 3rd Edition, Course Technology Cengage Learning Publications, ISBN 978- 1590282410.

Web Resources(Swayam / NPTEL)

1.	https://onlinecourses.nptel.ac.in/noc20_cs07/preview

Course Code	Course Name	Category	Hours / Week	Credits
25BAI14P	**Lab : Python Programming**	**Core Lab - I**	**4**	**2**

S.No.	Programs
1	Sample Programs using Lists, Tuples , Dictionaries and Decorators.
	Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2	Program to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from the user.
3	Write a Python script that prints prime numbers less than 20.
4	Program to find factorial of the given number using recursive function.
5	Write a Python program to count the number of even and odd numbers from array of N numbers.
6	Write a Python class to reverse a string word by word.
7	Given a tuple and a list as input, write a program to count the occurrences of all items of the list in the tuple. (Input : tuple = ('a', 'a', 'c', 'b', 'd'), list = ['a', 'b'], Output : 3)
8	Create a Savings Account class that behaves just like a BankAccount, but also has an interest rate and a method that increases the balance by the appropriate amount of interest (Hint: use Inheritance).
9	Write a Python program to construct the following pattern, using nested loop * ** *** **** ***** **** *** ** *
10	Read a file content and copy only the contents at odd lines into a new file.

S.No.	Programs
11	Create a Turtle graphics window with a specific size.
12	Write a Python program for Towers of Hanoi using recursion
13	Create a menu driven Python program with a dictionary for words and their meanings.
14	Devise a Python program to implement the Hangman Game.
15	Program to create a student database and calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria: Grade A: Percentage >=80 Grade B: Percentage >=70 and 80 Grade C: Percentage >=60 and <70 Grade D: Percentage >=40 and <60 Grade E: Percentage < 40
	Capstone Project : "Weather Data Analysis and Visualization" (Using Python libraries like matplotlib, numpy, and pandas to process and visualize weather data)

	Total Hours	**60**

Text Books

1	Charles Dierbach (2015), Introduction to Computer Science using Python - A computational Problem-solving Focus, Wiley India Edition.
2	Wesley J. Chun (2016), Core Python Applications Programming, Pearson Education, 3rd Edition.

Reference Books

1.	Mark Lutz (2018), Learning Python Powerful Object Oriented Programming, O'reilly Media,5th Edition.
2	John Zelle (2013), Python Programming: An Introduction to Computer Science.Course Technology Cengage Learning Publications, 2nd Edition, ISBN 978- 1590282410 .
3	Timothy A. Budd (2011), Exploring Python, Tata McGraw Hill Education Private Limited,1st Edition.

Web Resources (SWAYAM / NPTEL Courses)

1	https://onlinecourses.swayam2.ac.in/cec22_cs20/preview
2	https://onlinecourses.nptel.ac.in/noc21_cs32/preview

Course Code	Course Name	Category	Hours / Week	Credits
25BAI15C	**Data Literacy & Fundamentals of Data Science**	**Core - II**	**5**	**4**

Course Objectives

The course intends to cover

- Apply data validation techniques such as creating drop-down lists and using forms for structured data

- Understanding the foundational concepts of data, types of data, and the importance of data literacy input.

- Design and customize charts and visualizations to enhance data insights.

- Incorporate design elements such as color, labels, legends, and filters to enhance readability and user engagement.

- Learn the steps involved in preparing and analyzing data to support insights.

Course Learning Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	Identify and evaluate data sources and collection methods while considering quality and ethical standards.	K1
CLO2	Create and utilize Excel forms for structured data collection.	K2
CLO3	Identify and apply appropriate data types (numeric, text, date) and structures (tables, ranges).	K3
CLO4	Use advanced tools like Tableau or Power BI to build more interactive and insightful visualizations.	K3
CLO5	Identify practical problems that can be solved using a data-centric approach.	K3
K1 - Remember; **K2** - Understand; **K3** - Apply		

CLO – PLO Mapping

CLOs/PLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	3	2	3	2	2
CLO2	3	2	2	3	2
CLO3	2	2	3	2	1
CLO4	2	2	2	2	1
CLO5	2	2	2	2	1
3 - Substantial (high)		**2** - Moderate (medium)		**1** - Slight (low)	

Core I: Data Literacy & Fundamentals of Data Science

Unit	Content	No. of Hours
I	**Understanding Data and Data Literacy:** What is Data? Types of Data (Structured, Unstructured, Semi-structured) - Importance of Data Literacy in the Modern World - Data Collection Methods and Sources - Data Quality and Ethics. **Basics of Data Science:** What is Data Science? Overview and Applications - The Data Science Lifecycle: Collection, Cleaning, Analysis, Visualization, and Interpretation - Introduction to Key Tools & Technologies (Excel, Python, R, SQL) - Overview of Data Science Roles and Skills. **Data Analysis and Visualization:** Introduction to Data Analysis Concepts: Descriptive Statistics - Data Visualization Basics: Charts, Graphs, and Dashboards - Introduction to Visualization Tools (Excel Charts, Tableau, or Power BI basics). **Introduction to Data Science Workflow:** Data Cleaning and Pre-processing - Exploratory Data Analysis (EDA) - Basic Introduction to Machine Learning Concepts (Supervised vs Unsupervised) - Ethics and Responsible Use of Data. **Hands-on Exercises:** Lab 1: Exploring and Cleaning Real-World Datasets Lab 2: Visualizing Data with Charts and Graphs Using Excel or Tableau Lab 3: Conducting Basic Statistical Analysis and Interpretation Using Python or Excel	15
II	**Introduction to Data Collection in Excel:** Overview of Data Collection and Its Importance - Methods of Data Entry and Importing Data (CSV, Text files, Web Queries) - Data Validation and Creating Drop-down Lists - Using Forms for Data Collection. **Data Cleaning Basics:** Identifying and Handling Missing Data - Removing Duplicates and Inconsistent Entries - Using Text Functions for Cleaning (TRIM, CLEAN, SUBSTITUTE, LEFT, RIGHT, MID) - Working with Dates and Numbers: Correcting Formats. **Advanced Data Cleaning Techniques:** Using Conditional Formatting to Identify Errors - Using Filters and Sorting to Detect Issues - Introduction to Excel's Power Query for Data Cleaning. **Best Practices and Automation:** Creating Data Cleaning Checklists - Using Macros for Repetitive Cleaning Tasks - Tips for Maintaining Clean and Accurate Data. **Hands-on Exercises:** Lab 1: Importing and Validating Data Sets in Excel Lab 2: Cleaning and Transforming Raw Data Using Excel Functions Lab 3: Using Power Query and Macros for Efficient Data Cleaning	15
III	**Introduction to Data Analysis and Excel Basics:** Overview of Data Analysis Concepts - Navigating Excel Interface and Basic Features - Data Entry and Formatting Tips - Understanding Data Types and Structures. **Descriptive Statistics and Data Summarization:** Using Functions: SUM, AVERAGE, MEDIAN, MODE, MIN, MAX - Calculating Variance and Standard Deviation - Using COUNT, COUNTA, COUNTIF, COUNTIFS for Data Counting - Creating Pivot Tables for Data Summarization. **Data Visualization and Interpretation:** Creating Charts: Column, Bar, Pie, Line, Scatter Plots - Customizing Charts for Better Insights - Conditional Formatting for Data Highlights - Basic Dashboard Creation. **Introduction to Data Analysis Tools:** Using Excel's Data Analysis Toolpak - Introduction to What-If Analysis: Goal Seek, Scenario Manager - Basic Correlation and Regression Analysis. **Hands-on Exercises:** Lab 1: Calculating Descriptive Statistics and Using Pivot Tables Lab 2: Creating and Customizing Charts for Data Visualization Lab 3: Using Data Analysis Toolpak and What-If Analysis	15

Unit	Content	No. of Hours
IV	**Fundamentals of Data Visualization:** Importance and Principles of Data Visualization - Types of Visualizations: Charts, Graphs, Maps, and Infographics - Choosing the Right Visualization for Your Data. **Creating Visualizations in Tools:** Using Excel for Basic Visualizations (Bar, Line, Pie, Scatter) - Introduction to Advanced Tools (Tableau / Power BI) - **Customizing Visual Elements:** Colors, Labels, Legends, and Filters - Using Interactive Elements: Slicers and Filters. Dashboard Design and Best Practices: Components of an Effective Dashboard - Layout and User Experience Design - Storytelling with Data. **Building Dashboards:** Creating a Dashboard in Excel or Tableau/Power BI - Incorporating Multiple Visuals and Interactivity - Publishing and Sharing Dashboards. **Hands-on Exercises:** Lab 1: Building Basic Charts and Visualizations in Excel Lab 2: Designing Interactive Dashboards Using Tableau or Power BI Lab 3: Creating a Comprehensive Dashboard with Filters and Slicers	15
V	Understanding Data-Driven Decision Making: Concepts and Importance of Data-Driven Decisions - Identifying Business/Real-World Problems to Solve with Data - Overview of Data Sources and Collection Methods. Data Preparation and Analysis: Data Cleaning and Pre-processing - Exploratory Data Analysis (EDA) - Using Descriptive Statistics and Visualization to Derive Insights. Decision Modeling and Interpretation: Applying Basic Analytical Models (What-If Analysis, Simple Forecasting) - Interpreting Results for Decision Making - Presenting Data-Driven Recommendations. **Hands-on Exercises:** Lab 1: Problem Identification and Data Collection for Decision Making Lab 2: Data Cleaning, Analysis, and Visualization Lab 3: Building Decision Models and Presenting Insights	15
	Total Hours	**75**

Text Books

1	Marr, B. (2016). *Data Strategy: How to Profit from a World of Big Data, Analytics and the Internet of Things*. Kogan Page.
2	Provost, F., & Fawcett, T. (2013). *Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking*. O'Reilly Media.
3	McKinney, W. (2018). *Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython* (2nd ed.). O'Reilly Media.

Reference Books

1	Walkenbach, J. (2015). *Excel 2016 Bible*. Wiley.
2	Few, S. (2013). *Data Visualization: A Practical Introduction*. Analytics Press.
3	Knaflic, C. N. (2015). *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Wiley.

Web Resources (Swayam / NPTEL)

1	https://nptel.ac.in/courses/106/106/106106212/
2	https://swayam.gov.in/nd1_noc21_mg47/preview

Part – III: Allied Course

Course Code	Course Name	Category	Hours / Week	Credits
25BAI16A	Linear Algebra and Discrete Mathematics	Allied	4	3

Course Objectives

The Course intends to cover
- The computational techniques and algebraic skills essential for the study of systems of linear equations and matrix algebra.
- The fundamental concepts and tools in discrete mathematics with emphasis on their applications to computer science.

Course Learning Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	Remember the concept and basic operations of matrices.	K1
CLO2	Describe various types of graphs and their representations in computer memory.	K2
CLO3	Apply the concepts of connectives and tautological implications in data analysis.	K3
CLO4	Apply the concepts of Boolean algebra and lattices.	K3
CLO5	Develop regular expressions and finite automata for recognizing regular languages.	K3
K1- Remember**; K2 -** Understand**; K3 -**Apply**;**		

CLO – PLO Mapping

CLOs/PLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	2	2	2	2	3
CLO2	3	2	3	3	2
CLO3	3	2	3	3	2
CLO4	3	3	3	3	3
CLO5	3	3	3	3	2
3 - Substantial (high)	**2 - Moderate (medium)**		**1 - Slight (low)**		

Allied I- Linear Algebra and Discrete Mathematics

Unit	Details	No. of Hours
I	**Matrix:** Introduction- Transpose- Properties of Transpose-Determinants- Inverse of a Matrix- Solving Simultaneous linear equations by matrix method-Rank of a Matrix- Characteristics roots and vectors.	12
II	**Graph Theory:** Basic terminology - Paths, cycle and connectivity - Sub graphs - Types of graphs - Representation of graphs in computer memory - Trees - Properties of trees - Binary trees - Traversing Binary trees - Computer representation of general trees**.**	12
III	**Mathematical Logic:** Propositional calculus - Basic logical operations - Tautologies- Contradiction- Argument- Method of proof- Predicate calculus.	12
IV	**Boolean algebra and Lattices:** Boolean algebra – Basics theorems on Boolean Algebra – Lattices -Duality-Types of lattices -join reducible elements.	12
V	**Languages:** Operations on languages - Regular Expressions and regular languages - Grammar – Types of grammars - Finite state machine - Finite state automata.	12
	Total Hours	**60**

Text Books	
1.	Navanitham, P.A(2023), "Business Mathematics & Statistics", Jai Publishers, Trichy. Unit I: Chapter 4 P.No. :147-190 P.R.Vittal (2012) "Allied Mathematics", 6th Edition, Margham Publishers. Unit I: Chapter 5: P.No.: 5.50-5.75

2	J.K. Sharma, (2022)," Discrete Mathematics",2nd Edition, Macmillan India Ltd.
	 Unit II: Chapter 9 Section 9.1 – 9.5, 9.8
	          Chapter 10 Section 10.1 -10.3, 10.6, 10.8
	 Unit III: Chapter 12 Section 12.1 – 12.3, 12.8 ,12.9,12.11,12.12, 12.14
	 Unit IV: : Chapter13 Section 13.1-13.3
	          Chapter14 Section 14.1 -14.5
	 Unit V: Chapter 15 Section 15.3 – 15.7

Reference Books	
1	K. Sankara Rao (2018), "Numerical Methods for Scientists and Engineers", Prentice Hall India.
2	J. P. Tremblay, R. Manohar (2002), "Discrete Mathematics Structures with Applications to Computer Science", McGraw Hill International Edition.

Web Resources (Swayam / NPTEL)	
1.	https://archive.nptel.ac.in/courses/111/106/111106086/

Course Code	Course Name	Category	Hours / Week	Credits
25ENV1FC	**Environmental Studies**	**FC- I**	**2**	**2**

Unit	Content
I	The Multidisciplinary nature of environmental studies Definition; Scope and importance, Need for public awareness.
II	**Natural Resources:** Renewable and non-renewable resources: Natural resources and associated problems. - Forest resources: Use and Over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. - Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. - Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies. - Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.
III	**Ecosystems** - Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem. - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem: - .Forest ecosystem a.Grassland ecosystem b.Desert ecosystem c.Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Unit	Content
IV	**Biodiversity and its Conservation** - Introduction-Definition: genetic, species and ecosystem diversity. - Bio geographical classification of India. - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. - Biodiversity at global, National and local levels. - India as a mega-diversity nation. - Hot-spots of biodiversity. - Threats to biodiversity: habital loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India. - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
V	**Environmental Pollution Definition** - Causes, effects and control measures of: - a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards - Solid waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.
VI	**Social Issues and the Environment** - From Unsustainable to Sustainable development. - Urban problems related to energy. - Water conservation, rain water harvesting, watershed management. - Resettlement and rehabilitation of people; its problems and concerns. Case studies. - Environmental ethics: Issues and possible solutions. - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. - Wasteland reclamation. - Consumerism and waste products. - Environment Protection Act. - Air (Prevention and Control of Pollution) Act. - Water (Prevention and Control of Pollution) Act. - Wildlife Protection Act. - Forest Conservation Act. - Issues involved in enforcement of environmental legislation. - Public awareness.

Unit	Content
VII	**Human Population and the Environment** - Population growth, variation among nations. - Population explosion-Family welfare Programme. - Environment and human health. - Human Rights. - Value Education. - HIV/AIDS. - Women and Child Welfare. - Role of information Technology in Environment and human health. - Case Studies. **Biosafety and Biosecurity** The basic principles of biosafety. - Biological hazards and assess risk in laboratory settings. - Biosafety protocols to minimize risks associated with biological agents. - Role of biosafety in the protection of public health, environment, and nationalsecurity. The theoretical knowledge as well as practical applications to prepare learners for real-world biosafety challenges. 1. Introduction to Biosafety - Definition and importance of biosafety. - Historical perspective on biosafety incidents. - Biosafety vs. biosecurity: Key differences. 2. Biological Hazards and Risk Assessment - Classification of biological agents (e.g., bacteria, viruses, fungi, parasites). - Risk assessment methodology: Identifying hazards, evaluating risks, and control measures. 3. Biological Waste Management - Types of biological waste: Solid, liquid, sharps, etc. - Waste disposal techniques: Autoclaving, incineration, chemical disinfection. - Environmental impact and regulations surrounding waste management. 4. Standard Operating Procedures (SOPs) and Safety Practices - Developing and implementing SOPs for laboratory safety. - Practices for handling, storing, and disposing of biological materials.

VIII	**Field Work (Practical).** - Visit to a local area to document environmental assets-river/forest/grassland/ hill/mountain. - Visit to a local polluted site-Urban/Rural/Industrial/Agricultural. - Study of common plants, insects, birds. - Study of simple ecosystems-pond, river, hill slopes, etc.

Total Hours. 30

Web Resources

1.	https://www.ugc.gov.in/oldpdf/modelcurriculum/env.pdf
2.	Biosafety in Microbiological and Biomedical Laboratories (CDC, NIH). (BMBL) 6th Edition
3.	Sateesh, M. K. (2010). Bioethics and Biosafety. New Delhi: I. K. International Pvt Ltd.
4.	Additional Readings:Relevant journal articles, government publications, and guidelines (e.g., WHO, CDC, European Union, etc.).https://www.iberdrola.com/innovation/what-is-biosafety

Part – IV : Ability Enhancement Compulsory Courses(AECC)
(All the Undergraduate Programmes)

Course Code	Course Name	Category	Hours / Week	Credits
25SOF1AE	**Soft Skills**	**AECC - I**	**2**	**2**

Course Objectives
The course intends to cover
- The essential soft skills that is crucial for success in today's dynamic and interconnected workplace.

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

CLO	CLO Statements	Knowledge Level
CLO1	Understand the comprehensive skills to participate actively in conversation, writing short texts with expression	K1, K2, K3
CLO2	Infer the cohesive devices to describe and discuss any objects, pictures using compound, complex sentence forms.	K2, K3
CLO3	Comprehend the logic in the given situation to organize the ideas to write formal and informal letters.	K2, K3
CLO4	Understand the given material to organize it in a logical sequence to present a paragraph with main and supporting ideas with concluding sentences.	K3
CLO5	Present valuable ideas in conversation to emulate the main ideas and key points in short essays.	K3
K1 - Remember; **K2** - Understand; **K3** - Apply;		

Ability Enhancement Compulsory Course - I : Soft Skills

Unit	Details	No. of Hours
	Presentation Skills	
I	1 **Getting to Know You:** Grammar: Introduction to Tenses, Everyday English, Role-Play. Reading Activity: Different ways of communication. *Activities*: Fill in the blanks (Listening), Self Introduction (Speaking).	6
	2 **My Day:** Grammar: Present simple positive & negative/Adverbs of Frequency, Vocabulary & Speaking about Daily Activities. Listening: Observe and Answer/ Telling the time. *Activities:* Reading & Writing: Describe where you live.	
	3 **Your World:** Grammar: Possessive determiners. Listening: Positive & negative contractions. Reading & Writing: Personal profile. *Activities:* Talk about countries, nationalities (Vocabulary & Speaking).	
	4 **The World of Work:** Grammar: Yes/No & Wh Questions. Vocabulary & Speaking: Jobs. Listening: Recognize the schwa sound. *Activities:* Opening and closing an email (Reading & Writing).	
	5 **Places and Things:** Grammar: There is / there are, articles. Vocabulary & Speaking: Talk about rooms & furniture. Listening: Directions. Reading & Writing: Imperatives.	
	6 **24 Hours:** Grammar: Likes & Dislikes. Vocabulary & Speaking: Speak about hobbies and interests. Reading: Match the photos with descriptions. Writing: Write complete sentence using prompt. *Activities:* Observe & answer *(Listening).*	
	Practice: Listening & Speaking Presentations - Talking about how you learn – Understanding key information in a presentation – Writing sentences about you.	
II	**Confidence**	
	1 **Clothes and Shopping:** Grammar: Modal verbs/Adverbs of Frequency/Adjectives and Adverbs. Vocabulary & Speaking: Shopping. Reading & Writing: Product Review. *Activities:* Observe & answer *(Listening).*	6
	2 **Travel & Transport:** Grammar: Past simple questions. Vocabulary & Speaking: Talk about holidays. Listening: At the train station. *Activities:* Email - A perfect holiday (Reading & Writing).	
	3 **Health & Fitness:** Grammar: Past simple irregular verbs; Listening: Listen & Answer; Reading & Writing: Time sequencers; *Activities:* Talk about a healthy lifestyle (Vocabulary & Speaking)	
	4 **Music:** Grammar: Present perfect simple; Vocabulary & Speaking: Survey about music; Listening: Listen two people talk about music; *Activities:* Use adjectives and create sentences (Reading)	
	5 **Let's go shopping:** Vocabulary & Speaking: Town Survey; Listening: Listen and answer; Reading & Writing: Read and match; Activities: Countable & Uncountable (Grammar)	
	Practice: Writing a personal statement.	

Unit		Content	No. of Hours
III		**Creativity**	6
	1	**Cooking & Eating:** Grammar: Some & Any, Quantifiers. Vocabulary & Speaking about Food & Drink. *Activities* Kitchen conversation (Listening). Reading an article & answering.	
	2	**Survival:** Grammar: Comparison of adjectives. *Activities* Describing people (Speaking and Vocabulary). Listening to an audio & Answering. Reading & Writing: Read and Answer.	
	3	**Working Together:** Grammar: Verb + Noun phrases. *Activities* Technology (Vocabulary & Speaking). Listening: Listen & Answer. Reading & Writing: Notice.	
	4	**Music:** Grammar: Present perfect simple. *Activities* Survey about music (Vocabulary & Speaking). Listen to two people talking about music (Listening). Reading: Use adjectives and create sentences.	
	5	**Culture and Arts:** Grammar: Present perfect.Vocabulary & Speaking activity: Speak on the phone. *Activities:* Listen and answer. Reading & Writing activity: Review.	
		Practice: Writing comparison sentences & paragraphs.	
IV		**Problem-Solving**	6
	1	**Do's and Don'ts:** Grammar, Modal Verbs. *Activities* Roleplay (Speaking). Holidays in January (Listening). Reading an article & answering.	
	2	**Body:** Grammar: First conditional. Vocabulary & Speaking about Personality & Appearance. *Activities* Conversations about personality (Listening), Reading & Writing: Read and Answer about your skills.	
	3	**Speed:** Grammar: Present simple passive. Vocabulary & Speaking about relationships. Listening: Listen & Answer. Reading and Error spotting.	
	4	**Work:** Grammar: Adverbs of manner. Vocabulary & Speaking about work advice. Listening: Observe & Answer; Reading: Read & check your ideas.	
		Practice: Writing argumentative and descriptive essays.	
V		**Critical Thinking**	6
	1	**Influence:** Grammar: would / past habits. Listening: Sentence Correction. *Activities* Your inspiration (Speaking). Picture description (Reading).Rewrite the sentences (Writing).	
	2	**Money:** Grammar: Second conditional. *Activities:* Radio programme (Listening). Talk about games (Speaking). Reading & Writing: Fill in the blanks.	
	3	**Things that changed the world:** Grammar: articles. *Activities* :Talk about chewing gum (Speaking & Listening). Reading & Writing: Read and write a book review.	
		Practice: Writing Emails, reports and proposals.	
		Total Hours	30

Components for Internal Assessment and Distribution of Marks for CIA and ESE (Theory)

Max Marks	Marks for		Components for CIA						
	CIA	ESE	CIA		Model		Attendance	Active Engagement	Total
100	25	75	Actual	Weightage	Actual	Weightage	5	5	25
			50	5	75	10			

Question Paper Pattern

Component	Duration in Hours	Section A			Section B			Section C			Total
		Type of Question	No. of Questions	Marks	Type of Question	No. of Questions	Marks	Type of Question	No. of Questions	Marks	
CIA	2	MCQ	8	8x1=8	Either or	3	3x6=18	Either or	3	3x8=24	50
Model Exam / ESE	3	MCQ	10	10x1=10	Either or	5	5x5=25	Either or	5	5x8=40	75

Components for Internal Assessment and Distribution of Marks for CIA (Lab)

Max Marks	Marks for		Components for CIA					
	CIA	ESE	Test		Model		Experiments / Programs	Observation	Total
100	40	60	Actual	Weightage	Actual	Weightage	Marks	5	40
			50	10	50	15	10		

Examination Pattern

Component	Duration in Hours	Marks			Total Marks
		Practical Exam	Record	Weightage	
Test	2	50	-	10	50
Model	3	60	-	15	60
Experiments	-	-	-	10	10
Observation	-	-	-	05	05
Total Marks - CIA				40	40
ESE	3	50	10	-	60

Components for Internal Assessment and
Distribution of Marks for CIA (Foundation Course -Theory)

Max Marks	Marks for		Components for CIA				
	CIA	ESE	CIA		Model		Total
			Actual	Weightage	Actual	Weightage	
50	50	-	50	**25**	50	**25**	**50**

Question Paper Pattern

Duration in Hours	Mode of Exam	Type of Questions	No. of Questions	Marks
2	Offline	Open Choice	5 (Out of 8)	5 x 10=50

Components for and Distribution of Marks for ESE (Theory)
Ability Enhancement Compulsory Courses (AECC)
&
Question Paper Pattern

Duration in Hours	Mode of Exam	Type of Questions	No. of Questions	Marks
2	Online	MCQ	50	50x1=50