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 2026-27 for Undergraduate Programme

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

Programme: B.Sc. Computer Science with Cyber Security
Programme Code: BCY

(Applicable for the Students Admitted During the Academic Year 2026 - 27 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/2026/7425 dated 15/05/2026).

Program Learning Outcomes (PLOs)

The successful completion of B.Sc. CS With Cyber Security Programme shall enable the students to

PLO1	Design, implement, and evaluate a computer network and information security needs of an organization
PLO2	Analyze and evaluate the cyber security needs of an organization and society
PLO3	Explore Current and emerging techniques and technologies to formulate solutions for systems and organizations.
PLO4	Provide solutions making use of the knowledge gained in Artificial Intelligence& machine learning, Cloud Computing, Big Data and Cyber Security.
PLO5	Demonstrate comprehensive knowledge in IT solution development leading to excellence in professional career and/or higher education including research.

B.Sc. Computer Science with Cyber Security
Distribution of Credits and Hours for all the Semesters

Part	Courses	No. of Courses	Hours		Credits	Total		Semester
I	Language – I	4	4 X 4	16	3	12	12	1-4
II	Language - II	4	4 X 4	16	3	12	12	1-4
III	Core Theory(6 hrs / week)	2	4 X 6	24	4	16	100	3,6
	Core Theory(5 hrs / week)	11	9 X 5	45	4	36		1,2,4,5
	Core Lab (4 hrs / week)	4	4 X 4	16	2	8		1-4
	Core Lab (5 hrs /week)	3	3 X 5	15	3	9		5,6
	Allied	4	4 X 4	16	3	12		1-4
	Electives	2	2 X 5	10	3	6		5,6
	Project	1	1 X 6	6	5	5		6
	SEC : Internship	1	-	-	2	2		5
	Skill Enhancement (SEC)	3	3 X 2	6	2	6		3,4,6
IV	Foundation Course(FC)	2	2 X 2	4	2	4	14	1,2
	Foundation Course(FC) - Self-study	1	-	-	2	2		3
	Ability Enhancement Compulsory Course(AECC)	3	3 X 2	6	2	6		1,2,4
	Ability Enhancement Compulsory Course(AECC) - MOOC	1	-	-	2	2		3
V	Extension Activity-Liberal Arts Extra curricular and co-curricular activities	-	-	-	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**
I	4	3	4	3	18	13	4	4	-	-	**30**	**23**
II	4	3	4	3	18	13	4	4	-	-	**30**	**23**
III	4	3	4	3	22	15	-	4	-	-	**30**	**25**
IV	4	3	4	3	20	15	2	2	-	2	**30**	**25**
V	-	-	-	-	30	23	-	-	-	-	**30**	**23**
VI	-	-	-	-	30	21	-	-	-	-	**30**	**21**
Total	**16**	**12**	**16**	**12**	**138**	**100**	**10**	**14**	**-**	**2**	**180**	**140**

Curriculum

B.Sc. Computer Science with Cyber Security

Semester – 1									
Course Code	**Part**	**Course Category**	**Course Name**	**Hours /Week**	**Examination**				**Credits**
					Duration in Hours	**Max Marks**			
						CIA	**ESE**	**Total**	
26TAM11L	I	Language-I	Tamil-I	4	3	25	75	100	3
26HIN11L	I		Hindi-I						
26MAL11L	I		Malayalam-I						
26FRE11L	I		French-I						
26ENG12L	II	Language-II	English-I	4	3	25	75	100	3
26BCY13C	III	Core – I	Computing Fundamentals and C Programming	5	3	25	75	100	4
26BCY14P	III	Core Lab – I	C Programming Lab	4	3	40	60	100	2
26BCY15C	III	Core – II	Foundations of Networking and Cybersecurity	5	3	25	75	100	4
26BCY16A	III	Allied – I	Linear Algebra	4	3	25	75	100	3
26ENV1FC	IV	FC – I	Environmental Studies	2	2	50	-	50	2
26SOF1AE	IV	AECC – I	Soft Skills	2	2	-	50	50	2
			Total	**30**				**700**	**23**

Semester – 2									
Course Code	**Part**	**Course Category**	**Course Name**	**Hours /Week**	**Examination**				**Credits**
					Duration in Hours	**Max Marks**			
						CIA	**ESE**	**Total**	
	I	Language - I	Tamil – II	4	3	25	75	100	3
	I		Hindi – II						
	I		Malayalam – II						
	I		French – II						
	II	Language - II	English – II	4	3	25	75	100	3
	III	Core – III	Java Programming	5	3	25	75	100	4
	III	Core Lab - II	Java Programming Lab	4	3	40	60	100	2
	III	Core – IV	Security Fundamentals with Linux Operating System	5	3	25	75	100	4
	III	Allied – II	Optimization Techniques	4	3	25	75	100	3
	IV	FC – II	Human Rights	2	2	50	-	50	2
			Disaster Management						
	IV	AECC – II	Innovation & Design Thinking	2	2	-	50	50	2
			Intellectual Property Rights						
			Entrepreneurship Development						
Total				**30**				**700**	**23**

Semester – 3									
Course Code	Part	Course Category	Course Name	Hours/ Week	Examination				Credits
					Duration in Hours	Max Marks			
						CIA	ESE	Total	
	I	Language – I	Tamil – III	4	3	25	75	100	3
	I		Hindi – III						
	I		Malayalam – III						
	I		French – III						
	II	Language – II	English – III	4	3	25	75	100	3
	III	Core – V	Data Structures	6	3	25	75	100	4
	III	Core Lab – III	Data Structures Lab	4	3	40	60	100	2
	III	Core – VI	Cyber Law	6	3	25	75	100	4
	III	Allied – III	Number Theory	4	3	25	75	100	3
	III	SEC – I	Ethical Hacking Lab	2	3	40	60	100	2
	IV	FC – III	Basic Tamil / Advanced Tamil	-	2	50	-	50	2
			Indian Knowledge System (IKS)						
	IV	AECC – III	Online Course - MOOC	-	-	50	-	50	2
Total				**30**				**800**	**25**

Semester – 4									
Course Code	**Part**	**Course Category**	**Course Name**	**Hours / Week**	**Examination**				**Credits**
					Duration in Hours	**Max Marks**			
						CIA	**ESE**	**Total**	
	I	Language - I	Tamil – IV	4	3	25	75	100	3
	I		Hindi – IV						
	I		Malayalam –IV						
	I		French – IV						
	II	Language - II	English – IV	4	3	25	75	100	3
	III	Core – VII	Linux and Shell Programming	5	3	25	75	100	4
	III	Core Lab – IV	Linux and Shell Programming lab	4	3	40	60	100	2
	III	Core – VIII	Block Chain Technology	5	3	25	75	100	4
	III	Allied – IV	Statistical Methods and Their Applications	4	3	25	75	100	3
	III	SEC – II	Web Programming	2	3	40	60	100	2
	IV	AECC – IV	Quantitative Aptitude	2	2	-	50	50	2
	V	Extra-Curricular & Co-Curricular Activities	Liberal Arts	-	-	50	-	50	2
Total				**30**				**800**	**25**

Semester – 5									
Course Code	**Part**	**Course Category**	**Course Name**	**Hours/ Week**	**Examination**				**Credits**
					Duration in Hours	**Max. Marks**			
						CIA	**ESE**	**Total**	
	III	Core – IX	Cyber Crime Investigation and Digital Forensics	5	3	25	75	100	4
	III	Core Lab – V	Cyber Crime Investigation and Digital Forensics lab	5	3	40	60	100	3
	III	Core – X	Relational Database Management System	5	3	25	75	100	4
	III	Core Lab – VI	RDBMS lab	5	3	40	60	100	3
	III	Core – XI	Data Analytics for Fraud Detection	5	3	25	75	100	4
	III	Elective – I	Cloud Security	5	3	25	75	100	3
			Data Communication and Networking						
			Biometric Security						
	III	SEC- III	Internship	-	-	50	-	50	2
Total				**30**				**650**	**23**

Semester – 6									
Course Code	**Part**	**Course Category**	**Course Name**	**Hours/ Week**	**Examination**				**Credits**
					Duration in Hours	**Max Marks**			
						CIA	**ESE**	**Total**	
	III	Core – XII	Cyber Security	6	3	25	75	100	4
	III	Core Lab- VII	Cyber Security Lab	5	3	40	60	100	3
	III	Core – XIII	Artificial Intelligence & Machine Learning	6	3	25	75	100	4
	III	Elective – II	Internet of Things	5	3	25	75	100	3
			Intrusion Detection and Prevention System						
			Network Security & Cryptography						
	III	SEC – III	Network Management Systems and Operations Lab	2	3	40	60	100	2
	III	Core – XIV	Project with viva Voce	6	3	40	60	100	5
Total				**30**				**700**	**21**
Grand Total				**180**				**4200**	**140**

Semester I

Semester – 1									
Course Code	**Part**	**Course Category**	**Course Name**	**Hours /Week**	**Examination**				**Credits**
					Duration in Hours	**Max Marks**			
						CIA	**ESE**	**Total**	
26TAM11L	I	Language-I	Tamil-I	4	3	25	75	100	3
26HIN11L	I		Hindi-I						
26MAL11L	I		Malayalam-I						
26FRE11L	I		French-I						
26ENG12L	II	Language-II	English-I	4	3	25	75	100	3
26BCY13C	III	Core – I	Computing Fundamentals and C Programming	5	3	25	75	100	4
26BCY14P	III	Core Lab – I	C Programming Lab	4	3	40	60	100	2
26BCY15C	III	Core – II	Foundations of Networking and Cybersecurity	5	3	25	75	100	4
26BCY16A	III	Allied – I	Linear Algebra	4	3	25	75	100	3
26ENV1FC	IV	FC – I	Environmental Studies	2	2	50	-	50	2
26SOF1AE	IV	AECC – I	Soft Skills	2	2	-	50	50	2
			Total	**30**				**700**	**23**

Part – I: Language I – Tamil – I

(All the Undergraduate Programmes)

Course Code	Course Name	Category	Hours / Week	Credits
26TAM11L	Tamil - I	Language – I	4	3

Course Objectives

The Course intends to cover

- இலக்கியத்தின் வளர்ச்சி நிலைகளைக் கற்பித்தல்
- மொழியியல் அடிப்படையில் இலக்கணம் கற்பித்தல்
- திறனாய்வு முறையினை ஊக்குவித்தல்
- படைப்பாக்கத் திறன் பயிற்சி அளித்தல்

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 கொள்வர்.	K1, K2
CLO2	சிறந்த மற்றும் வாழும் கவிஞர்களின் கவிதை வழியாக தர்மம், அன்பு, ஈகை போன்ற மனித மாண்புகளை அறிந்து கொள்வர்.	K2, K3
CLO3	சிறந்த படைப்பாளர்களின் சிறுகதைகள் மற்றும் குறுநாவலில் வெளிப்படும் சமூகச் சிந்தனைகளை அறிந்து ஒழுகுதல்.	K3
CLO4	தற்கால இலக்கியங்களான புதுக்கவிதை, சிறுகதை தோன்றி வளர்ந்த பின்புலத்தை அறிதல்.	K1, K3
CLO5	மொழித்திறனைக் கற்றலின் வாயிலாக நடைமுறை வாழ்வியலுக்குத் தேவையான சிறுகதை மற்றும் புதுக்கவிதைகளைப் படைத்தல்.	K2, K3
K1 - Remember; **K2** - Understand; **K3** – Apply		

Part – I: Language – I: தமிழ் - I

Unit	Content	No. of Hours
I	**நாட்டுப்பற்று** 1. பாரதியார - உலகத்தை நோக்கி வினவுதல் 2. பாரதிதாசன் - தமிழ்ப்பேறு 3. கவிமணி - ஒற்றுமையே உயிர்நிலை 4. தேவதேவன் - சாலையும் மரங்களும் செருப்பும், புதிய வீடு 5. அப்துல் ரகுமான் - போட்டி, பாதை 6. கவிஞர் வாலி - புத்தகச் சந்தை	14
II	**சமூகம்** 1. ஈரோடு தமிழன்பன் - எட்டாவது சீர்... 2. கவிஞர் தாமரை - தொலைந்து போனேன் 3. நா. காமராசன் - திருநங்கைகள் காகிதப் பூக்கள் 4. வைரமுத்து - மரங்களைப் பாடுவேன் 5. அமுத பாரதி - புள்ளிப் பூக்கள் (ஹைக்கூ) 6. நாட்டுப்புறப் பாடல்கள் (தாலாட்டுப் பாடல் , தெம்மாங்கு பாடல் , உழவுத்தொழில்)	14
III	**வாழ்வியல்** சிறுகதை 1. காஞ்சனை - புதுமைப்பித்தன் 2. சோற்றுக் கணக்கு - ஜெயமோகன் 3. மரத்தைக் கர்ப்பம் சுமந்தவள் - ஆண்டாள் பிரியதர்சினி குறுநாவல் • ஆயிஷா – இரா.நடராசன்	12
IV	**இலக்கிய வரலாறு** 1. மரபுக்கவிதையின் தோற்றமும் வளர்ச்சியும் 2. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் 3. ஹைக்கூ கவிதையின் தோற்றமும் வளர்ச்சியும் 4. சிறுகதையின் தோற்றமும் வளர்ச்சியும்	10

Unit	Content	No. of Hours
V	**இலக்கணம் மற்றும் படைப்பாற்றல்** 1. எழுத்துகள் (முதல் எழுத்துகள், சார்பெழுத்துகள்) 2. எழுத்துக்களின் பிறப்பு 3. மாத்திரைகள் 4. படைப்பாற்றல் திறன்(சிறுகதை மற்றும் புதுக்கவிதைப் படைத்தல்)	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, (1995), ஒரு கதவும் கொஞ்சம் கள்ளிப்பாலும் கவிதை தொகுப்பு, காந்தளகம் பதிப்பகம், சென்னை.
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	ஜெயமோகன், (2024), அறம் (சிறுகதை), விஷ்ணுபுரம் பதிப்பகம்.
8	இரா.நடராசன், (2022) ஆயிஷா, பாரதி புத்தகாலயம்.
9	குமரன் கோ (2010), தமிழ் இலக்கணம் எளிய அறிமுகம் , சந்தியா பதிப்பகம்.
10	சக்திவேல் சு,(2012), நாட்டுப்புறவியல், மணிவாசகர் பதிப்பகம்.

Part – I: Language I – Hindi – I

Course Code	Course Name	Category	Hours / Week	Credits
26HIN11L	Hindi - I	Language - I	4	3

Course Objectives

The course intends to

- Improve grammatical knowledge
- Continue to read and learn about articles and think about them
- Read and understand short stories and understand the thoughts and life of the people of this country
- Provide translation knowledge and the ability to read and analyse a message are also gained

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.	K2
CLO3	Develop an interest in the appreciation of short stories.	K2, K3
CLO4	Comprehend the grammatical structures and sentence making.	K3
CLO5	Understand the language and developing English to Hindi translation skill.	K4
K1 - Remember; **K2** - Understand; **K3** – Apply; **K4**-Analyse		

Part – I: Language – I - Hindi - I

Unit	Content	No. of Hours
I	**Prose : Bharthi Gadya Sangrah** 1.Sanskurthi hai kya? (Lalith nibandh)- Ramdhari singh Dinkar 2. Voh cheeni Bhayi (Rekha chitra) – Mahadevi varma 3. Badthe shor ka gahratha sankat (pradoshan) - Rajendrakumr ray & Ravindra Varma 4. Ghar Loutthe huye – (Athma katha) – Harivamshraai Bacchan 5. Paramanu urja evam khadya padarth samrakshan (vaigyanik lek) - Parmaanu urja vibhag (Bharth sarkar) 6. Cinema (film) – Manmohan Chdda	14
II	**Non Detailed Text Short Stories: Aat Kahaniyan** 1. Vrath-bang - Jayashankar Prasad 2. Sath gathi - Premchand 3. parda - Yespal 4. Apna apna bhagya - Jaynendrakumar 5. Bhrammarakshas ka shishya - Mukthibhodh 6. Dana-bhusa - Markandeya	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	Bharathi gadya sangrah, editor: Madhudhavan, publisher: Vani prakashan, 4697/5,Daryaganch, New Delhi – 110002.
2	Aatt Kahaniyan, Editor : Dr. H.R. Mihir, Publisher : Jaya bharthi prakashan, 267 B, Maya press Road, Allahabad–211 003
Reference Book	
1	Naveenhindivyakaran, 2002,Dakshin Bharat Hindi Prachar, Sabha,Chennai–600017

Part – I: Language – I - Malayalam – I

Course Code	Course Name	Category	Hours / Week	Credits
26MAL11L	Malayalam - I	Language - I	4	3

Course Objectives

The Course intends to

- Improve grammatical knowledge
- Read and learn about articles and think about them
- Read and understand short stories and understand the thoughts and life of the people of this state
- Provide translation knowledge and the ability to read and analyze a message

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: Language – I - Malayalam – I

Unit	Content	No. of Hours
I	Novel – Njanabharam - E. Santhoshkumar	14
II	Novel – Njanabharam - E. Santhoshkumar	14
III	Short Story - Ente Priyapetta Kadhakal –Sara Joseph	12
IV	Short Story - Ente Priyapetta Kadhakal – Sara Joseph	10
V	Composition & Translation (English to Malayalam)	10
	Total Hours	**60**

Text Books

1	Novel -Njanabharam - E. (2018) Santhoshkumar, Mathrubhumi Books, Kochi, Kerala.
2	Short Story-Ente Priyappeta Kadhakal -Sara Joseph, (2005) D.C.Books,Kottayam, Kerala.
3	Expansion of ideas, General Essay and Translation. (A Simple passage).

Reference Books

1	Malayala Novel SahithyaCharitram-K.M.Tharakan (2018) (N.B.S.Kottayam)
2	Cherukatha Innale Innu-M.Achuyuthan (2020) (D.C Books, Kottayam)
3	Sahithya Charitram Prasthanangalilude- Dr.K.M George, (2017) (D.C.Books Kottayam)
4	Malayala Sahithyavimarsam- Sukumar Azheekode (2022) (D.C.books)

Part – I: Language I – French - I

Course Code	Course Name	Category	Hours / Week	Credits
26FRE11L	French - I	Language - I	4	3

Course Objectives

The Course intends to cover

- Familiar everyday expressions and basic phrases aimed at the satisfaction of concrete needs.
- Key aspects and recognize of Francophone cultures such as greetings, etiquette, daily life, and basic geography of French-speaking countries.
- Short, simple texts such as postcards, emails, or short descriptions about themselves and their immediate environment.
- Construction of simple sentences using correct word order and basic vocabulary.
- The developing of sensitivity to cross-cultural differences in communication and social practices.
- The reading and understanding of short, simple texts such as personal messages, advertisements, menus, and schedules.

Course Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	Improve all the four French language skills (speaking, listening, reading and writing) (Effective communicators).	K1
CLO2	Comprehend French and other Francophone nations' cultures and civilizations.	K2
CLO3	Comprehend the fundamentals of language structure, vocabulary, grammar and phonetics (language skill).	K3
CLO4	The French DELF-A1 Certification is appreciated.	K4
K1 - Remember; **K2** - Understand; **K3** – Apply; **K4**-Analyse		

Part – I: Language – I French – I

Unit	Content	No. of Hours
I	Grammaire: pg(122-124) Bienvenue (pg 10-17)	14
II	Contacts(pg 18-28) Grammaire: pg(125-128)	14
III	Communication pg(29-33) Grammaire: pg(129-130)	12
IV	Qu'est-ce qu'il font pg(34-44) Grammaire: pg(131-136)	10
V	Communication pg(45-49) Grammaire: pg(137-139(	10
Semester I Portions from Textbook « Nouvelle Génération A1» :UNITÉ 1, UNITÉ 2 (Pg 10-49). Cahier d'exercices (Pg122-139)		
	Total Hours	**60**

Reference Books	
1	Luca Giachino, Carla Baracco, Romain Chrétien (DELF), (2022) Nouvelle Génération A1, Didier FLE.
2	Nathalie Hirschsprung, Tony Tricot, 2017, Cosmopolite, Hachette.

Course Code	Course Name	Category	Hours / Week	Credits
26ENG12L	English-I	Language-II	4	3

Course Objectives

The course intends to cover

- Literary appreciation and textual analysis
- Vocabulary and reading comprehension skills
- Grammatical competence to enhance writing and speaking skills

Course Learning Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	Recognize and interpret poetic elements that cultivate aesthetic sensibility, creativity and cultural understanding.	K1, K2
CLO2	Interpret and apply the characterisation and the narrative techniques in creative writing and content creation ethically.	K2,K3
CLO3	Analyze and apply vocabulary and reading strategies to interpret workplace documents	K3, K4
CLO4	Employ vocabulary and grammatical proficiency in communication to enhance clarity in workplace interactions.	K3
CLO5	Demonstrate effective communication skills for lifelong learning.	K3
K1 - Remember; **K2** - Understand; **K3** – Apply; **K4**-Analyse		

Part II: Language-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	**Short Stories: Morality** 1 The Necklace – Guy de Maupassant 2 The Lottery - Shirley Jackson 3 The Monkey's Paw - W. W. Jacobs	12
III	**Grammar** 1. **Nouns:** Types, Singular vs. Plural forms, Case and Gender, Common errors with nouns 2. **Pronouns:** Types, Personal, Possessive, Reflexive, Intensive (Emphatic), Demonstrative, Relative, Interrogative, Indefinite, and Reciprocal pronouns, Common errors with pronouns 3. **Verbs:** Action verbs and linking verbs, Transitive and intransitive verbs, Auxiliary verbs and Modal verbs, Verb tenses, Common errors with verbs	12
IV	**Language Competency: Vocabulary** 1. **Vocabulary:** Synonyms, Antonyms, Guessing meaning from context, 2. **Word Formation:** Homonyms, Homophones, Homographs, Portmanteau words, Collocations, Compounding Words, Root Words, Prefixes and Suffixes, Clipping, Acronym, Abbreviations, Reduplication	12
V	**English for Communication** Listening for General and Specific Information. Self - Introduction, Introducing others, Greetings. Intensive Reading - a prose passage, a poem and a short story Descriptive writing – writing descriptive essays in two to three paragraphs.	12
	Total Hours	**60**

Reference Books

1.	Leech, G., & Svartvik, J. (2002). A communicative grammar of English (2nd ed.). Pearson Education.
2.	Swan, M. (2016). Practical English usage (4th ed.). Oxford University Press.
3.	Shepherd, M., Carter, P. (Illustrator), & Hogan, S. (2005). The art of civilized conversation: A guide to expressing yourself with style and grace. Perigee Books.
4.	Ramazani, J., Ellmann, R., & O'Clair, R. (Eds.). (2003). The Norton anthology of modern and contemporary poetry (Vols. 1–2). W. W. Norton & Company.
5.	Wren, P. C., & Martin, H. (2015). High school English grammar and composition (50th ed.). S. Chand & Company.

Web Resources (Swayam/NPTEL)

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

Course Code	Course Name	Category	Hours / Week	Credits
26BCY13C	Computing Fundamentals and C Programming	Core-I	5	4

Course Objectives

The Course intends to cover

- The knowledge about Computer fundamentals.
- The concepts and techniques in C Programming.
- Problem solving in C.

Course Learning Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	Learn about the Computer fundamentals and the Problem solving.	K1
CLO2	Understand the basic concept s of C Programming	K2
CLO3	Describe the reason why different decision making and loop constructs are available for iteration in C	K2
CLO4	Demonstrate the concept of user defined Functions, Recursions, Scope and Lifetime of Variables, Structures and Unions.	K2
CLO5	Develop C programs using Pointers Arrays and file management	K3
K1 - Remember; **K2** - Understand; **K3** – Apply		

CLO – PLO Mapping

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

Core - I: Computing Fundamentals and C Programming

Unit	Content	No. of Hours
I	**Fundamentals of Computers:** Introduction - History of Computers - Generations of Computers - Classification of Computers - Basic Anatomy of a Computer System -Input Devices - Processor - Output Devices - Memory Management - AI Memory System- Types of Software - Overview of Operating System - Programming Languages - Translator Programs - Problem Solving Techniques.	15
II	**Overview of C** : Introduction - Character set - C tokens - keywords and Identifiers - Constants -Variables - Data types - Declaration of variables - Assigning values to variables - Defining Symbolic Constants - Arithmetic, Relational, Logical, Assignment, Conditional, Bitwise, Special, Increment and Decrement operators – Arithmetic Expressions-Evaluation of expression- precedence of arithmetic operators –Type conversion in expression–operator precedence and associativity - Mathematical Functions - Reading & Writing a character - Formatted input and output.	15
III	**Decision Making and Branching:** Introduction – if, if….else, Nesting of, if …else statements- elseif ladder – the switch statement, the ?: Operator – the goto Statement. **Decision Making and Looping :** Introduction - the while statement- the do statement – the for statement-jumps in loops. **Arrays :** Character Arrays and Strings.	15
IV	**User Defined Functions :** Introduction – need and elements of user - defined functions -Definition- Return Values and their types- Function Calls–Declarations–Category of Functions - Nesting of Functions -Recursion–Passing Arrays and Strings to Functions – The Scope, Visibility and Life time of Variables-Multifile Programs. Structures and Unions- Dynamic Memory Allocation – malloc(), calloc(), free().	15
V	**Pointers :** Introduction -Understanding Pointers -Accessing the address of a variable Declaration and Initialization of pointer variable – Accessing a variable through its pointer - Chain of Pointers -Pointer Expressions – Pointer Increments and Scale factor- Pointers and Arrays- Pointers and Strings – Array of Pointers – Pointers as Function Arguments - Functions returning Pointers – Pointers to Functions – Pointers and Structures. File Management in C.	15
	Total Hours	**75**
Text Book		
1.	Balagurusamy E(2017), Computing Fundamentals & C Programming – Tata McGraw-Hill, Second Reprint.	
Reference Books		
1.	Ashok N Kamthane(2002), Programming with ANSI and Turbo C, Pearson	
2.	Henry Mullish & Hubert L. Cooper(1996), The Spirit of C, Jaico.	
Web Resources (Swayam / NPTEL)		
1.	https://nptel.ac.in/courses/106106210	
2.	https://nptel.ac.in/courses/106105171	
3.	https://atlan.com/know/ai-memory-system/	

Course Code	Course Name	Category	Hours / Week	Credits
26BCY14P	C Programming Lab	Core Lab-I	4	2

S. No.	List of Programs
1.	Sample programs.
	Write a C program to reverse a number.
2.	Write a C program to display day of the week using switch case.
3.	Write a C program to check whether a number is an Armstrong number.
4.	Write a C program to find the sum, average, standard deviation for a given set of numbers.
5.	Write a C program to generate n prime numbers.
6.	Write a C program to generate Fibonacci series.
7.	Write a C program to print magic square of order n where n>3 and n is odd.
8.	Write a C program to sort the given set of numbers in ascending order.
9.	Write a C program to check whether the given string is a palindrome or not using pointers.
10.	Write a C program to count the number of vowels in the given sentence.
11.	Write a C program to find the factorial of a given number using recursive function.
12.	Write a C program to print the students mark sheet assuming roll no, name, and marks in 5 subjects in a structure. Create an array of structures and print the mark sheet in the university pattern.
13.	Write a function using pointers to add two matrices and to return the resultant matrix to the calling function.
14.	Write a C program which receives two filenames as arguments and check whether the file contents are same or not. If same delete the second file
15.	Write a program which takes a file as command line argument and copy it to another file. At The end of the second file write the total i) no of chars ii) no. of words and iii) no. of lines.
	Total Hours **60**
Text Book	
1.	E Balagurusamy (2008), Computing Fundamentals & C Programming – Tata McGraw-Hill, Second Reprint.
Reference Books	
1.	Ashok N Kamthane (2002), Programming with ANSI and Turbo C, Pearson
2.	Henry Mullish & Hubert L. Cooper(1996), The Spirit of C, Jaico.
Web Resources (Swayam / NPTEL)	
1.	https://nptel.ac.in/courses/106106210
2.	https://nptel.ac.in/courses/106105171

Course Code	Course Name	Category	Hours / Week	Credits
26BCY15C	Foundations of Networking and Cybersecurity	Core II	5	4

Course Objectives

The course intends to cover

- The basics of networking, OSI model and key protocols
- Different types of networking devices and their uses
- Tools to simulate network scenarios.

Course Learning Outcomes

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

CLO	CLO Statements	Knowledge Level
CLO1	Understand basic networking concepts and protocols.	K1,K2
CLO2	Understand network device functions and recognize common security threats.	K2
CLO3	Understand and detect the cyber-attacks like spoofing and tunneling.	K3
CLO4	Analyze static and dynamic routing, WAN Technologies	K4
CLO5	Analyze and configure Access Control Lists.	K4
K1 - Remember; **K2** - Understand; **K3** - Apply;**K4** - Analyze		

CLO – PLO Mapping

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

Core - II: Foundations of Networking and Cybersecurity

Unit	Content	No. of Hours
I	**Introduction to Networking:** What is a Network?- Local Area Network (LAN)- Wide Area Network (WAN)-Types of Mode. **Open Systems Interconnection (OSI) Model:** Why we Need Open Systems Interconnection (OSI)- Open Systems Interconnection (OSI) Layers-Transmission Control Protocol (TCP) / User Datagram Protocol (UDP)- Way Hand Shake-Real-World Attack Examples at each OSI layer-Packet Sniffing using Wireshark. **TCP/IP Model:** Need of Transmission Control Protocol (TCP) / Internet Protocol (IP) Model- Transmission Control Protocol (TCP) / Internet Protocol (IP) Layer-TCP 3-Way Handshake with attack simulation. 1. Real-world attack examples at each OSI layer. 2. Packet sniffing using Wireshark. 3. TCP 3-Way Handshake with attack simulation .	15
II	**Sub Netting:** Subnetting-Classless Inter Domain Routing (CIDR)- Create Subnets Understanding Variable Length Subnet Masks (VLSM)- Private Internet Protocol (IP) Addresses-How subnetting helps with network segmentation for Zero Trust. **Packet Flow in Same & Different Network:** Domain Name System (DNS) and Working - Map Hostnames to Internet Protocol (IP) Addresses-Configure Cisco Device as Domain Name System (DNS) Client-How to Configure a Cisco Router as a DNS Server? - No Internet Protocol (IP) - Domain-lookup Command-Address Resolution Protocol (ARP)-Analyze DNS tunneling, DNS spoofing attacks. **Information about Networking Device:** Network Devices-Hubs-Switch-Carrier Sense Multiple Access with Collision Detection (CSMA CD)- Collision & Broadcast DomainHow Switches Work? - Layer 2 Switching- Router-Layer 3 Switch and working threat detection. 1. Design a segmented network for HR, IT, DevOps, and isolate with firewall rules. 2. Use Wireshark to detect a suspicious DNS 3. Simulate port mirroring and analyze mirrored traffic.	15

Unit	Content	No. of Hours
III	**Internet Protocol (IP) / Internet Control Message Protocol (ICMP):** What is Internet Control Message Protocol- How Ping process works-How Extended Ping Command works- What is Traceroute-How Traceroute Command works-show processes Command in detailed to map protocols-What is Ping sweeps Cyber Attacks-what is ICMP tunneling-Cyber Attacks- How to Detect ICMP misuse in Cyber Security Industry. **Automatic Private IP Addressing (APIPA):** What is APIPA- why do we need of APIPA-How APIPA works. **Address Resolution Protocol (ARP):** What is Address Resolution Protocol (ARP)-Need and type of (ARP)- What is ARP poisoning & spoofing, Perform demo for Cyber Industry. **Routing Protocols (Static & Dynamic):** What are Routing Protocols-Comparing Internal Routing Protocols (IGPs)- Administrative Distance & Metric-Equal Cost Multi-Path (ECMP) Explanation & Configuration - Understanding Loopback Interfaces and Loopback Addresses - Passive-interface Command-Security risks in routing protocols (BGP hijack, OSPF poisoning)- How attackers use static routes to pivot within the network. 1. Simulate ICMP scanning with Nmap and monitor traffic. 2. Analyze ARP poisoning in a test environment.	15
IV	**Static - Next Hop / Exit Interface:** What is IP Routing- Local Routes and How they Appear in the Routing Table - Connected, Static, & Dynamic Routes - Floating Static Route - Explanation and Configuration - Default Static Route - Create a Static Host Route. **WAN Technologies:** What is Wide Area Network - Cisco VPN- WAN Connection Types- Leased Line Definition and Explanation - Multiprotocol Label Switching (MPLS)- VPN and split tunneling risks in Cyber Industry. **Network Address Translation (NAT):** Static Network Address Translation (NAT)-Dynamic Static Network Address Translation (NAT)- Port Address Translation (PAT) Configuration- Secure site-to-site connections with IPsec. 1.Simulate a compromised router path 2.Analyze a PCAP of a VPN session.	15

Unit	Content	No. of Hours
V	**Access Control List (ACL):** Access Control List and its types - Configuring Standard and Extended Access Control List (ACL)- Configuring Named Access Control List (ACL) - NAT traversal and how malwares use it – What are ACLs in firewalls – Work with Palo Alto/Cisco ASA for ACLs- AI Based IDS. **Dynamic Host Configuration Protocol:** Configure Cisco Router as Dynamic Host Configuration Protocol (DHCP) Server-DHCP Relay Agent- Configure Cisco Router as a DHCP Client- Automatic Private IP Addressing (APIPA)- Rogue DHCP server detection in Cyber Industry- MITM Cyber-attacks using DHCP starvation.**Telnet & Secure Shell (SSH):** Need of Telnet & Secure Shell (SSH)- Telnet & Secure Shell (SSH)- Setting Up Telnet- Setting Up Secure Shell (SSH)- SSH b DHCP attack simulation using Yersinia or better capture-force tools and how to detect them in logs for Cyber Industry. 1. Configure ACLs to prevent port scanning. 2. DHCP attack simulation using Yersinia or bettercap. 3. Simulate brute-force login and analyze logs in Fail2Ban/syslog 4. Simulate VLAN separation and test access control.	15
	Total Hours	**75**

Text Books	
1.	James F. Kurose and Keith W. Ross (2013), Computer Networking: A Top-Down Approach, Pearson Education, 6th Edition.
2.	Behrouz A. Forouzan (2007), Data Communications and Networking, McGraw-Hill Companies, Incorporated.
3.	Andrew S. Tanenbaum & David J. Wetherall (2011), Computer Networks, Prentice Hall, 5th Edition
4.	Lisa Bock (2019), Learn Wireshark: Confidently navigate the Wireshark interface and solve realworld networking problems, Packt Publishing Ltd.
5.	William Stallings (2007), Network Security Essentials, Prentice Hall, 3rd Edition
6.	Kevin R. Fall and Martin L. Stevens (2019), TCP/IP Illustrated, Volume 1: The Protocols AddisonWesley Professional,2nd Edition.
7.	Gary A. Donahue (2011), Network Warrior, O'Reilly Media, 2nd Edition.
8.	Jazib Frahim, Omar Santos, Andrew Ossipov (2019), Cisco ASA: All-in-one Next-Generation Firewall, IPS, and VPN Services, CISCO Press, 3rd Edition.
Reference Books	
1.	Wendell Odom (2013), CCNA Routing and Switching 200-120 Official Cert Guide Library, CISCO Press,1st Edition
2.	Chris Sanders (2011), Practical Packet Analysis: Using Wireshark to Solve Real-World Network Problems, No Starch Press, 2nd Edition
3.	Laura Chappell (2012), Wireshark Network Analysis, 2nd Edition.
4.	Doug Barth, Evan Gilman (2017), Zero Trust Networks, O'Reilly Media, 1st Edition
Web Resources (Swayam / NPTEL)	
1.	https://onlinecourses.swayam2.ac.in/cec24_cs09/preview
2.	https://onlinecourses.nptel.ac.in/noc24_ee46/preview
3.	https://www.simplilearn.com/ai-intrusion-detection-systems-article

Course Code	Course Name	Category	Hours / Week	Credits
26BCY16A	Linear Algebra	Allied - I	4	3

Course Objectives

The course intends to cover

- The fundamental concepts of matrix algebra, including operations, determinants, inverses, and methods for solving systems of linear equations
- The concept of linear transformations, their algebraic operations and applications.

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	Understand the structure and characteristics of Hermitian and skew-Hermitian matrices.	K2
CLO3	Apply suitable direct or iterative methods to solve real-life problems modeled as linear systems.	K3
CLO4	Analyze the rank–nullity relationship to interpret the solution structure of systems of linear equations.	K4
CLO5	Analyze the Gram–Schmidt process to transform linearly independent sets into orthonormal sets.	K4
K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze		

CLO - PLO Mapping

CLOs/PLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	2	2	2	2	3
CLO2	2	2	2	3	2
CLO3	2	2	2	1	2
CLO4	3	3	2	2	2
CLO5	3	3	2	2	2
3 - Substantial (High)		2 - Moderate (Medium)		1 - Slight (Low)	

Allied I: Linear Algebra

Unit	Content	No. of Hours
I	**Matrix Algebra:** Introduction–types of matrices–Operations of Matrices– Transpose – Properties of Transpose–Determinants–Inverse of a Matrix–Solving Simultaneous linear equations by matrix method–Rank of a Matrix. Matrix Operations in Neural Networks and Machine Learning Connection.	12
II	**Special Matrices:** Symmetric and Skew–Symmetric Matrices–Hermitian and Skew–Hermitian Matrices–Orthogonal and Unitary Matrices–Characteristics Roots and Vectors–Cayley-Hamilton's Theorem.	12
III	**Solution of Simultaneous Linear Algebraic Equations:** Gauss Elimination Method – Gauss Jordan Method– Gauss Jacobi Method – Gauss Seidel Method.	12
IV	**Vector Spaces:** Introduction of Real Vector Space – Subspaces – Linear Combination and Spanning Sets –Linear Dependence and Independence–Basis and Dimensions–Row Space, Column Space, Null Space, Rank and Nullity.	12
V	**Linear Transformations and Inner Product Spaces:** Linear Transformation and Examples–Sum, Scalar Multiple and Composition of Linear Transformation. Inner Product Spaces–Dot Product of Euclidean Inner Product in R^n–General Inner Product–Orthogonality–Orthonormal Basis–Gram–Schmidt Process.	12
	Total Hours	**60**
Problems - 80% & Theory – 20%		
Text Books		
1.	Navanitham, P.A(2023), Business Mathematics & Statistics, Jai Publishers, Trichy. Unit I: Chapter 4 P.No. :147-190.	
2.	Vittal, P.R(2012) Allied Mathematics", 6th Edition, Margham Publishers. Unit II: Chapter 5: P.No.: 5.8-5.24 & 5.50-5.75**.**	
3.	Kandasamy, P,Thilagavathy,K & Gunavathy,K(2007), Numerical Methods, S. Chand and Company Ltd, New Delhi. Unit III : Chapter 4 : Section 4.1, 4.2, 4.8, 4.9.	
4.	Rangrao, S.Bhamare, Pravin S.Waldhe & Anagha R.Medhekar (2017), Linear Algebra", 1st EditionNirali Prakashan Publishers,Pune.Unit IV: Chapter 3 : Section 3.1-3.6 Unit V: Chapter 5 : Section 5.1-5.3,Chapter 6 : Section 6.1-6.5	
Reference Books		
1.	Seymour Lipschutz and Marc Lipson(2001), Linear Algebra 3rd Edition.	
2.	David C. Lay, Steven R. Lay, and Judi J. McDonald (2014). Linear Algebra and its Applications. 5th Edition. Pearson.	
Web Resources (SWAYAM/NPTEL/Others)		
1.	https://nptel.ac.in/courses/111106135	
2.	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ma21	
3.	https://ocw.mit.edu/courses/18-06-linear-algebra-spring-2010/	

Part – IV: Foundation Course

(All the Undergraduate Programmes)

Course Code	Course Name	Category	Hours / Week	Credits
26ENV1FC	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: - a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. 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
26SOF1AE	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 (AECC) - I: Soft Skills

Module	Unit	Details	No. of Hours
I		**Presentation Skills**	
	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.	

III	**Creativity**		
	1	**Cooking & Eating:** Grammar: Some & Any, Quantifiers. Vocabulary & Speaking about Food & Drink. *Activities* Kitchen conversation (Listening). Reading an article & answering.	6
	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**		
	1	**Do's and Don'ts:** Grammar, Modal Verbs. *Activities* Roleplay (Speaking). Holidays in January (Listening). Reading an article & answering.	6
	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**		
	1	**Influence:** Grammar: would / past habits. Listening: Sentence Correction. *Activities* Your inspiration (Speaking). Picture description (Reading).Rewrite the sentences (Writing).	6
	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						
100	CIA	ESE	CIA		Model		Attendance	Active Engagement	Total
	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**	60	**15**	**10**		

Examination Pattern

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