YEAR-WISE AND SEMESTER-WISE DISTRIBUTION OF SUBJECTS
DEPARTMENT OF B.Sc. COMPUTER SCIENCE & CLOUD COMPUTING
FIRST SEMESTER
ACADEMIC YEAR 2024-25 OF 2024-27 BATCH (CBCS)

Sl. No.	Part	Subject Code	Title of the Subject	Hours /Week	Duration of Exam (hrs.)	Marks			Credits
						Internal	External	Total	
	THEORY								
1	I	EN23101	General English-I (AECC-1)	3	3	40	60	100	3
2	I	VE18101	Value Education and Personality Development (AECC-2)	2	3	40	60	100	2
3	II	BS22101	Fundamentals Of Information Technology(SEC-1)	4	3	40	60	100	4
4	II	BS19101	Mathematics – I (Core-1)	5	3	40	60	100	4
5	II	CSCC22101	Operating Systems (Core-2)	4	3	40	60	100	4
6	II	BS22103	Problem solving and Programming Through C (Core-3)	5	3	40	60	100	4
	PRACTICALS								
7	II	CSCC22102	Fundamentals Of Information Technology(SEC-1)	2	3	40	60	100	1
8	II	CSCC22103	Unix Shell Programming Lab(Core-2)	2	3	40	60	100	1
9	II	CSCC22104	Problem solving and Programming Through C(Core-3)	2	3	40	60	100	1
	Total			**29**	**-**	**360**	**540**	**900**	**24**

***Generic Elective (GE)** ***Ability Enhancement Compulsory Course (AECC)**
***Skill Enhanced Compulsory Course (SECC)** ***Inter-disciplinary (ID)**

GENERAL ENGLISH -I

Credits : 3 **Semester : I**
Subject Code: EN23101 **No of Lecture Hours: 45**

Objectives:

- Through an exposure to contemporary passages, the students would be able to have a grasp on the language of today, with specific emphasis on the Listening, Speaking, Reading and Writing skills.
- Through the components of a passage, vocabulary and grammar section, speaking component and writing segments, there is a holistic development for language proficiency and fluency.

Outcomes:

CO1: To distinguish between words which are either spelt or pronounced alike, yet render distinct meanings; imparting a sound clarity on everyday usage of language, and for developing the art of parallel listening and writing.

CO 2: To construct vocabulary and to gain understanding on the tense component, a pivotal constituent for language structuring and vocabulary building.

CO 3: To identify with economical word constructions, paying specific attention in constructing sound writing skills.

CO 4: To interpret functional grammar, the basic part involved in sentence constructing to improve linguistic skills.

CO 5: To develop communication skills to provide a platform for language efficiency for effective language deliver

UNIT- I **9Hrs**

Fundamentals of Communication-I

Short Story - The Mystery Story (source – teacherluke.co.uk) (1)

- Present Tense (2)
- Past Tense (2)
- Future Tense (2)
- Paragraph Writing (2)

01/02/23
Chairperson
Board of Studies (UG & PG)
Department of English
Osmania University
HYDERABAD-500 007.

UNIT- II

Language Proficiency for Effective Writing and Speaking Skills-I **9Hrs**

Poem- Goodbye Party For Miss Pushpa T.S. by Nissim Ezekiel (2)

- Subject- Verb Agreement (3)
- Punctuations (2)
- Review Writing (2)

UNIT-III **9Hrs**

Wit and Humour

From the text Atea Party by Ruth Prawer Jhabvala

- Explanation of the text (2)
- Grammar -------Nouns, Articles (2)
- Vocabulary --- Homonyms, Homophones, Homographs (2)
- Writing Skill ------Note- Making (2)

UNIT-IV **9Hrs**

Human Values

From the text "India's Contribution to World Unity"

- Explanation of the text (2)
- Grammar----adverbs (2)
- Vocabulary----Adjective and Adverb Suffixes (2)
- Writing Skill------Formal Letters and Curriculum Vitae (2)

UNIT-V **9Hrs**

From the text "Sachin Tendulkar"

- Explanation of the text (3)
- Grammar----- Adjectives, Comparison of Adjectives (3)
- Vocabulary-----Common Errors, Commonly Misspelt words, Commonly Confused Words (3)
- Writing Skill-----References and Bibliographies

01/02/23
Chairperson
Board of Studies (UG & PG)
Department of English
Osmania University
HYDERABAD-500 007.

ESSENTIAL READING

1. Skills Annexe – Functional English for Success.Orient Black Swan.

SUGGESTED READING

1. Balasubramaniam, M. 1985. **Business Communication**. New Delhi: Vani Educational Books.
2. Krishna Mohan and Meera Banerjee.1990. **Developing Communication Skills**. New Delhi: Macmillan India Ltd.
3. Krishnaswamy, N. and Sriraman, T. 1995. **Current English for Colleges**. Madras:Macmillan India Ltd.
4. Narayanaswamy, V.R. 1979. **Strengthen Your Writing**. New Delhi : Orient Longman
5. Sharma, R.C. and Krishna Mohan. 1978. **Business Correspondence**. New Delhi: Tata McGraw-Hill Publishing Co.

01/02/23
Chairperson
Board of Studies (UG & PG)
Department of English
Osmania University
HYDERABAD-500 007.

VALUE EDUCATION & PERSONALITY DEVELOPMENT

Credits : 2 **Semester: I**
Course code: VE18101 **No. of Lecture Hours: 30**

Objectives:

- To produce intellectually competent, morally upright, socially committed, spiritually inspired citizens in the service of the nation and the world.
- To transform the students into conscientious citizens through holistic education and contribute to nation building.

Course Outcomes:

CO1: **Differentiate** accepted norms and counter values and to identify the various dimensions of Human Development.
CO2: **Demonstrate** Love and Experience of God and identify the Basic Issues of Life and Happiness as a life goal.
CO3: **Understand** the importance of Concern for others and critique the various problems that deter the growth of the society.
CO4: **Recognize** the traits of a good personality and practice Self-exploration.
CO5: **Interpret** the Purpose of Life and Goal Setting and demonstrate Self-management.

UNIT- I **6Hrs**

Introduction to Ethics

1. Why Value Education? 2
2. Reasons to have Ethics for Life 2
3. Accepted Norms and Counter Values 1
4. Dimensions of Human Development: Physical, Intellectual, Emotional, Moral, Spiritual and Social 1

UNIT-II **6Hrs**

Approach to Life

1. Conscience and Pseudo-Conscience 1
2. Happiness as Life-goal 1
3. Values revealed and lived in Religions 1
4. Experience of God 1
5. Love: The three components of Love 1
6. Some of the basic stages and issues of Life: Family, Love, Sex, Marriage 1

UNIT-III **6Hrs**

Concern for others

1. Self and Another 2
2. Human Context 2
3. Moral Problems of a Society / True Society : Social Desire, Social Fear, Social Silence, Social Indifference 2

UNIT-IV **6Hrs**

Transformation of self

1. Definitions of personality 1
2. Characteristics of personality 1
3. Elements of personality 1
4. Traits of good personality 1
5. Self-Identity, self-concept
6. Self-Discovery, self-acceptance 1
7. Self-Esteem

WORK SHEET (1): Self Estimation 1

UNIT-V **6Hrs**

Life enrichment Skills

1. Purpose of life - Goal setting 1
2. Characteristics of Goals 1
3. Building Relationships 1
4. Time Management
5. Stress Management
6. Emotional Management 1
7. Conflict Management
8. Team Management (Group Dynamics) 1

WORK SHEETS (1) & (2): 1) Anger Management
2) Team Management 1

ESSENTIAL READING

1. Human Values - Development Programme - AIACHE
2. In Harmony

FUNDAMENTALS OF INFORMATION TECHNOLOGY

Credits : 4 **Semester: I**
Course Code: BS22101 **No. of Lecture Hours: 60**

Objective:

- To understand the application of computers and telecommunications equipment tostore, retrieve, transmit and manipulate data in the context of a business or an enterprise.

Course Outcomes: The students would be able to

CO1: **Understand** basic computer terminology and number systems.
CO2: **Learn** about operating systems, and its types.
CO3: **Learn** about the applications of Information technology
CO4: **Importance** of system development and the phases of SDLC
CO5: **Use** of modern means of communications, types of networks and topologies

UNIT-I **12hrs**

Introduction to Computers

1.	**Definition** - Characteristics and limitations of computers	1
2.	Block diagram of a computer, CPU	1
3.	Primary and secondary storage	1
4.	Input and output devices	1

Data Representation and Storage

5.	Data representation in computers, bits and bytes	1
6.	Number systems (Binary, Octal and Hexadecimal)	1
7.	Conversion from decimal to binary, octal, hexadecimal and vice versa	2
8.	Secondary storage	1
9.	Random Vs Sequential access, Tracks and Sectors	1
10.	Storage characteristics	1
11.	Increasing data storage capacity through compression (disk compression and file compression)	1

UNIT-II **12hrs**

Operating Systems

1.	Meaning, Definition, Functions	1
2.	**Types of operating systems:** Desktop OS, Server OS, Mainframe OS,	
3.	Hand-held OS & Embedded OS	2
4.	Multi Tasking and Multi threading	1
5.	Multi User, multi processor support	1
6.	Miscellaneous tasks	1
7.	Batch Processing systems	1
8.	Real time systems, Time sharing systems	1

User Interfaces

9.	GUI, Pen based, Touch Screen & Conversational interfaces	2
10.	Common Operating Systems: DOS, Windows 95/98 and UNIX	2

UNIT-III **12hrs**

Applications of Information Technology

1.	Application programs	2
2.	Horizontal Market Applications, Vertical Market Applications	1
3.	Customs Applications, Shareware and Public domain software	1

Transaction Processing

4.	Centralized transaction processing	1
5.	Client Server software, Distributed computing and Replication	1
6.	Information tools for management control: DSS, EIS, GIS, OLAP	2
7.	Data Warehousing and Data Mining	1

IT in Business and Industry

8.	Home and at play, Education and Training, Entertainment and Arts	1
9.	Science, Engineering and Math, Computers in hiding	1

IT Enabled Services

10.	BPO, KPO & Call centers	1

UNIT-IV **12hrs**

Systems Development

1.	The six phases of Systems Analysis & Design	2

The challenges of Digital Age

2.	Security issues: Threats to Computers & Communications	2
3.	Security: Safeguarding Computers & Communications	2
4.	Quality of Life Issues	2
5.	The ethics of using databases: concerns about accuracy & privacy	2
6.	Five generations of programming languages	2

UNIT-V **12hrs**

Modern Communications

1.	Communications, FAX	2
2.	Voice Mail and Information Services, Email	2

Group Communications

3.	News groups, Mailing lists, IRC, Network games	2
4.	Video conferencing	1
5.	File exchange, bandwidth	1
6.	Modem, Network topologies	2
7.	Network Types – LAN, MAN and WAN	1
8.	Dialup Access	1

ESSENTIAL READING

1. Curtin Dennis, P. and Foley, Kim. 2000. **Information Technology – The Breaking Wave**. 7th edition. Tata McGraw Hill Publications: New Delhi.
2. Williams Brian, K. and Sawyer Stacey, C. 2007. **Using Information Technology** – A Practical Introduction to Computers and Communications 6th edition. Tata McGrawHill Publications: New Delhi.

SUGGESTED READING

1. Sinha Pradeep, K. and Sinha Preeti. 2007. **Computer Fundamentals, Concepts, Systems and Applications.** 4th edition. BPB Publications
2. Rajaraman. 2006. **Fundamentals of Computers.** 4th edition. PHI Publications.
3. Bharihoke Deepak. 2000. **Fundamentals of Information Technology.** 2nd edition. ExcelBooks.

MATHEMATICS – I

Credits : 4 **Semester: I**
Course Code: BS19101 **No. of Lecture Hours: 75**

Objective:

- To provide strong foundation on differential equations, applications of mean value theorems, infinite series and Fourier series.

Course Outcome:

CO1: Categorize the differential equations with respect to their order and linearity. Solve differential equations of first order using numerical and analytical methods such as Integrating Factors.

CO2: Analyze and Solve basic application problems described by first order differential equations. Such orthogonal trajectories.

CO3:Solve second order Homogeneous Equations with Constant Coefficients. Obtain exact and numerical solutions using differential equations technology.

CO4:.Combine the necessary Laplace transform techniques to solve second-order ordinary differential equations. Solve the Laplace transform of standard functions.

CO5: Analyze a Fourier series of a given periodic function by evaluating Fourier coefficients.

UNIT I **15 Hrs**

DIFFERENTIAL EQUATIONS OF THE FIRST ORDER AND FIRST DEGREE

1.	Exact differential equations – Integrating factors – Change of variables	5
2.	Linear differential equations	5
3.	Differential Equations reducible to linear form Bernoulli's equation	5

UNIT II **15 Hrs**

LINEAR DIFFERENTIAL EQUATIONS WITH CONSTANT COEFFICIENTS

1.	Auxiliary equation, complementary function, particular integral	5
2.	Working rule for finding P.I. when $X=e^{ax}$, Sin ax, Cos bx, x^m, $e^{ax}v$, $x^m.v$,	5
3.	Cauchy's equation	5

UNIT III **15Hrs**

CALCULUS

1.	Mean Value theorems: Rolle's Theorem	5
2.	Lagrange's Mean Value theorem with their geometrical interpretations	5
3.	Cauchy's mean Value theorem and applications	5

UNIT IV **15 Hrs**

INFINITE SERIES

1. Sequence: Definition of a sequence, Limit, Convergent ,divergent and oscillatory sequences Series- General Properties of series 5
2. Necessary condition for convergence- Series of positive terms, Comparison tests- p-test 5
3. D' Alembert's ratio test, Cauchy's Root Test, Alternating Series(Without Proof), absolute and conditional convergence 5

UNIT V **15 Hrs**

FOURIER SERIES

1. Fourier Series of a function in an interval of length 2π 5
2. Fourier Series for even and odd functions 5
3. Half range series: Half range Sine series and Cosine series 5

ESSENTIAL READINGS

1. Zafar Ahsan. **Differential Equations and their Applications.** 2nd Edition. Prentice Hall of India, (Units I ,II and III)
2. B.S. Grewal. 2014. **Higher Engineering Mathematics.** 3rd Edition**.** Khanna Publishers. India: New Delhi. (Unit IV and V)
3. Iyengar T.K.V, B. Krishna Gandhi, Ranganatham, Prasad M.V.S.S.N. 2009. **Engineering Mathematics Vol. II.** S.Chand & Co New Delhi.

OPERATING SYSTEMS

Credits : 4 **Semester : I**

Course Code: CSCC22101 **No. of Lecture Hours: 60**

Objective:

- To learn the core ideas in operating systems, process management, memory protection, CPU scheduling, concurrent programming, deadlocks and File systems.

Course Outcomes:

CO1: **Explain** functions, types and structures of operating system
CO2: **Analyze** various process management concepts including scheduling and synchronization
CO3: **Illustrate** the concepts of memory management and I/O system.
CO4: **Solve** issues related to file system interface.
CO5: **Choose** an appropriate Page replacement algorithm

UNIT – I	**12Hrs**
1. Introduction -Define Operating System, mainframe system, desktop systems	2
2. Multiprocessor systems, distributed systems, clustered systems	2
3. Real time systems , hand held systems	2
4. Operating system structures-system components	2
5. Operating system services, system calls	2
6. system programs, system structures , virtual machines	2

UNIT – II	**12Hrs**
1. Process concept-process concept, process scheduling	3
2. Operation on processes, cooperating processes	3
3. Inter process communication	3
4. Process scheduling-basic concepts, scheduling criteria, scheduling algorithms.	3

UNIT – III	**12Hrs**
1. Process synchronization-critical section problem	3
2. Semaphores, monitors	3
3. Deadlocks-deadlock characterization, methods for handling deadlocks	3
4. Deadlock prevention, Deadlock avoidance, Deadlock detection	3

UNIT – IV	**12Hrs**
1. File system-file concept, access methods	3
2. Directory structure, file system mounting, file system sharing.	3
3. File system implementation-file system structure, file system implementation.	3
4. Directory implementation, allocation methods, free space management	3

UNIT – V		**12Hrs**
1	Memory management-swapping, contiguous memory allocation	2
2	Fragmentation-internal and external fragmentation	2
3	Paging, segmentation, segmentation with paging.	3
4	Virtual memory management-demand paging	2
5.	Page replacement algorithms, Thrashing and working set model.	3

ESSENTIAL READING

1. Silber Schatz Abraham, Galvin Peter, B. and Gagne Greg. 2006. **Operating System Concepts.** 6th Edition. India: Wiley.

SUGGESTED READING

1. Tanenbaum Andrew, S. 2001. **Modern Operating Systems.** New Delhi: Pearson Education.

PROBLEM SOLVING AND PROGRAMMING THR0UGH 'C'

Credits : 4 **Semester: I**
Course Code: BS22103 **No. of Lecture Hours: 75**

Objective:

- To understand major programming constructs which serve as the basis for any programming language.

Course Outcomes: The students would be able to

CO1: **Understand** the basic introduction of computer and programming language.
CO2: **Identify** 'C' data types, operators and data input /output functions.
CO3: **Categorize** 'C' control structures, arrays and string concept.
CO4: **Explain** 'C' function, recursion, pointers and dynamic memory allocation.
CO5: **Express** the concept of structures, union and file handling in 'C'

UNIT – I **15hrs**

1. Flow charts and algorithms 2
2. Computer Languages 2
3. Introduction to C programming, History of 'C' Language 1
4. Program Development, Creating and running programs 1
5. Structure of C program 2
6. Data types and constants and variables 2
7. Scope of a variable 2
8. Operators and expressions 2
9. Type Casting, Assignment statements 1

UNIT – II **15hrs**

1. **Data input and output** 2
2. **Decision Making and branching**
   a. if-else 2
   b. switch 1
   c. goto 1
3. **Decision Making and looping**
   a. while 1
   b. do-While 1
   c. for 2
   d. nested loops 2
   e. break, continue 1
4. **More example programs** 2

UNIT – III **15hrs**

1. **Arrays**
   Single dimensional, Multi dimensional 3
2. **Functions**
   Types of functions- User defined functions, Standard Functions 3
   Calling Functions 3
   Recursive Functions 3
3. **Strings**
   String handling functions 3

UNIT-IV **15hrs**

1. **Pointers**
   a. Declaration, passing pointer to functions, 2
   b. Pointers and arrays. 2
2. **Dynamic memory allocations.** 2
3. **Structures and Union**
   a. Simple structures 2
   b. Array of structures 2
   c. Pointer to structures 2
   d. Union 2
4. **More example programs** 1

UNIT – V **15hrs**

1. **File handling**
   a. Various modes of operations 2
   b. Input output Functions
      i. Manipulating data using getchar(), putchar(), getc(), putc() 2
      ii. Manipulating numeric data using getw(), putw() 2
      iii. Write and read using fprintf() and fscanf() 2
   c. File Status Functions 2
   d. Positioning Functions (ftell(), fseek(), rewind()) 2
2. **File Programs** 2
3. **Macros (Macro Substitution and File Inclusion Directives)** 1

ESSENTIAL READING

1. Behrouz A. Forouzan **Computer Science, A Structured Programming Approach using C.** 3rd Edition**.**
2. Byron, Gottfried. Jitender, Chhabra. 2010. **Programming with C.** India: Schaum'sOutlines Series.

SUGGESTED READING

1. Kanetkar, Yashwanth. 1995. **Let us C.** New Delhi: BPB.
2. Thareja, Reema. 2016. **Programming in C.** 2nd Edition. India: OUP.

FUNDAMENTALS OF INFORMATION TECHNOLOGY PRACTICALS

Credits : 1 **Semester: I**
Course Code: CSCC22102 **No. of Practical Hours: 30**

Objectives: To impart basic computer usage and to introduce you to a suite of productivity toolsthat will aid in our day to day activities as follows

- Word is used in documentation
- Excel is used for accounting, analyzing huge amounts of data and for graphical representation of data
- Power Point is used to create presentations
- Access is used to create databases

Course Outcome:

- Students will be able to concentrate more on hands on experience. It enables the participants to make the best use of office suite in their day-to-day requirements and make use ofit to improve the standards in the educational environment.

	Topic	No. of Hours
1.	Preparing Resume, time table	2
2.	Newsprint, applying formats	2
3.	Documents using bullets and numbering	2
4.	Mail Merge	2
5.	Creating an Excel worksheet , applying functions	4
6.	Marks memorandum, Customer bill	2
7.	Creating charts, creating an Excel database	2
8.	Sort and filter data, Goal seek, Scenario Manager	4
9.	Preparing a Power point presentation	2
10.	Creating an Access database, tables	4
11.	Queries on data, Designing forms and reports	4

UNIX SHELL PROGRAMMING LAB

Credits : 1 **Semester: I**
Course Code: CSCC22103 **No. of Practical Hours: 30**

Objectives:

- To understand various commands and programming constructs of shell programming.
- To implement various algorithms of CPU scheduling and memory management algorithms.

Course Outcome:

- Students will be able to identify UNIX/Linux utilities and implement shell scripts to perform tasks that are more complex.

	Topic	No. of Hours
1.	Introduction to Vi Editor, File and Directory related Commands.	2
2.	Miscellaneous Commands	2
3.	Arithmetic in Shell Scripts	4
4.	Sample programs using Shell Script	4
5.	Decision making in Shell Script	4
6.	Loop control structures in Shell Script.	4
7.	Implementation of UNIX System calls	4
8.	Implementation of CPU Scheduling algorithms	4
9.	Implementations of memory management algorithms	2

PROBLEM SOLVING AND PROGRAMMING THROUGH C PRACTICALS

Credits : 1 **Semester: I**
Course Code: CSCC22104 **No. of Practical Hours: 30**

Objective: To develop applications using structured programming.

Course Outcome: Students will be able to write, compile and debug programs in C language.

Topic	No. of Hours
1. C Program to find the greatest among 3 numbers	
2. C Program to check whether a given number is odd or even	
3. C Program for Natural numbers upto n using while	
4. C Program for Natural numbers upto n using do-while	
5. C Program for Natural numbers upto n using for	2
6. C program to print Even and Odd numbers upto n	
7. C program for sum of natural numbers upto n	
8. C program for sum of Even numbers and Odd numbers upto n	
9. C program to check the given number is prime or not	
10. C program to find whether a given number is a perfect number or not	2
11. C Program to find whether a given number is Armstrong or not	
12. C Program to carry out basic arithmetic operations using switch	
13. C program for factorial of a given number using while loop	
14. C program for factorial of a given number using for loop	
15. C Program to get Fibonacci series up to n	3
16. C program for finding sum of digits of a given number	
17. C program for finding the reverse of a given number	
18. C program for finding whether the given number is palindrome or not	
19. C program to find maximum, minimum,of an array	
20. C program for bubble sort	3
21. C program for linear search	
22. C program to find sum of an elements of an array	
23. C programs for addition and subtraction of matrices	
24. C program for Matrix multiplication	
25. C program to transpose a matrix	4
26. C program to find string length using strlen()	
27. C program for string reverse using string function strrev()	
28. C Program for string concatination using strcat()	
29. C program for String comparision using : strcmp()	
30. C program usingstring copy function strncpy()	4
31. C program for lower to uppercase conversion using strupr()	

32. C program for lower to uppercase conversion using strlwr()
33. C Program for function with no arguments and no return values
34. C Program for functions with arguments and no return values
35. C Program for function with arguments and with return values 4
36. C program for functions with no arguments and with return values
37. C program illustrating functions using call by value
38. C program illustrating functions using call by reference & to pass pointers as function arguments
39. C Program for Factorial of a given number using recursion
40. C Program illustrating pointers 4
41. C Program which illustrates structures
42. C Program which illustrates array of structures
43. C program which illustrates unions
44. C Program to demonstrate sequential file access
45. C program illustrating random file access
46. C program on fscanf, fprintf, getw, putw,fgets and fputs functions in files 4

YEAR-WISE AND SEMESTER-WISE DISTRIBUTION OF SUBJECTS
DEPARTMENT OF B.Sc. COMPUTER SCIENCE & CLOUD COMPUTING
SECOND SEMESTER
ACADEMIC YEAR 2024-25 OF 2024-27 BATCH (CBCS)

Sl. No.	Part	Subject Code	Title of the Subject	Hours /Week	Duration of Exam (hrs.)	Marks			Credits
						Internal	External	Total	
	THEORY								
1	I	EN23201	General English-II (AECC-3)	3	3	40	60	100	3
2	I	IC23201	Indian Heritage and Culture (AECC-4)	2	2	40	60	100	2
3	II	CSCC22201	IT Hardware & Networking(GE-1)	4	3	40	60	100	4
4	II	BS18201	Mathematics- II (Core-4)	5	3	40	60	100	4
5	II	CSCC22202	Computer Networks (Core-5)	4	3	40	60	100	4
6	II	BS18202	Data Structures Through C(Core-6)	5	3	40	60	100	4
	PRACTICALS								
7	II	CSCC22203	IT Hardware & Networking (GE-1)	2	3	40	60	100	1
8	II	CSCC22204	Computer Networks (Core-5)	2	3	40	60	100	1
9	II	CSCC22205	Data Structures Through C(Core-6)	2	3	40	60	100	1
10	III	PL18001	PLANET* (Outreach)	-	-	-	-	-	1
	Total			**29**	**-**	**360**	**540**	**900**	**24**

***Generic Elective (GE)**
***Ability Enhancement Compulsory Course (AECC)**
***Skill Enhancement Course (SEC)**
***Programme of Loyola Academy for Neighbourhood Empowerment and Transformation (PLANET)**

GENERAL ENGLISH -II

Credits : 3 **Semester: II**
Subject Code : EN23201 **No of Lecture Hours: 45**

Objectives:

- To enhance the learners' communication skills by giving adequate exposure in reading, writing, listening and speaking skills and the related sub-skills.
- To develop oral and written communicative skills among the students so that their employability enhances and English becomes the medium of their livelihood and personality.

Outcomes:

CO 1. To identify a sound understanding on the formation of words and to demonstrate the functional grammatical component in the sentence.
CO 2. To paraphrase ideas and thoughts in a coherent, neat and organized manner in order to utilize the writing skills for sound writing propagandas.
CO3. To create an understanding on Indian Literature, alongside to develop and chisel their communication skills.
CO4. To recognize the moral element which underlies in the short story; an exposure to informal language.
CO5. To develop listening and speaking skills through effective sentence constructions and efficient delivery.

Unit-I

Fundamentals of effective communication- II	**9Hrs**
Flash Fiction- The Mice by Lydia Davies	(1)
• Simple, Complex and Compound Sentences	(3)
• Conversion of sentences	(3)
• Information Transfer	(2)

UNIT-II	**9Hrs**
Language Proficiency for Effective speaking and Writing Skills-II	
Short Story- The Face on the Wall by E V Lucas	(2)
• Active and Passive Voice	(3)
• Conjunctions	(2)
• Essay Writing	(2)

01/02/23
Chairperson
Board of Studies (UG & PG)
Department of English
Osmania University
HYDERABAD-500 007.

UNIT-III **9Hrs**

Health

From the text "Three Days to See"

- Explanation of the text (3)
- Grammar -------Usage of Modal Auxiliary Verbs (2)
- Vocabulary --- Collective Nouns, Technical Vocabulary (2)
- Writing Skill ------News Paper Report (2)

UNIT-IV **9Hrs**

Short Story

From the text "Leela's Friend" by R.K.Narayan

- Explanation of the text (3)
- Grammar----Phrasal Verbs, Wh- Questions (2)
- Vocabulary----Noun and Verb Suffixes (2)
- Writing Skill------Writing a Narrative (2)

UNIT-V **9Hrs**

Inspiration

From the text "The Last Leaf" by O. Henry

- Explanation of the text (3)
- Grammar----- Prepositions (2)
- Vocabulary-----Idioms (2)
- Writing Skill----- Précis Writing (2)

ESSENTIAL READING

1. **Epitome of Wisdom**. Guntur: Maruthi Publications.

SUGGESTED READING

1. Mohan Krishna and Banerjee Meera. 1990. **Developing Communication Skills**. New Delhi:Macmillan India Ltd.
2. Krishnaswamy, N. and Sriraman,T. 1995. **Current English for Colleges**. Madras: Macmillan India Ltd.
3. Narayanaswamy, V.R. 1979.**Strengthen Your Writing**. New Delhi: Orient Longman.
4. Sharma, R.C. and Mohan Krishna. 1978. **Business Correspondence**. New Delhi: Tata McGraw-Hill Publishing Co.

01/02/23
Chairperson
Board of Studies (UG & PG)
Department of English
Osmania University
HYDERABAD-500 007.

INDIAN HERITAGE AND CULTURE

Credits : 2 **Semester: II**
Course Code: IC23201 **No. of Lecture Hours: 30**

Objectives:

- To apprise the students with a sound background of Indian Culture.
- To equip the students with social & community problems of India.
- To prepare the student for civil service exams where Indian Heritage & Culture paper is compulsory for all the streams.

Course Outcomes:

CO1: Students will have knowledge about Indian Customs and Traditions.
CO2: Students can make use of the subject knowledge to attempt all kinds of competitive exams, especially civil services
CO3: The Subject helps the student community to have knowledge of historical and contemporary social, religious and political issues of the nation

UNIT I **6hrs**

INTRODUCTION – ANCIENT INDIAN HERITAGE AND CULTURE

- Meaning of the culture-Characteristics of Indian culture
- Indus valley civilization and Vedic/Aryan Culture
- Mauryas and Guptas
- Ashoka the great and Harshavardhana
- South Indian Kingdoms-Satavahanas, Pallavas, Cholas
- Development of the art and architecture-contributions of Buddhism and Jainism

UNIT II **6hrs**

MEDIEVAL INDIA – INFLUENCE OF ISLAM ON INDIAN CULTURE

- Cultural Development under the Delhi Sultanate and Mughals
- Sufi and Bakti Movement in Medieval period
- Cultural Achievements of Kakatiyas and Qutubshahis
- Development of Art and architecture during medieval India

Prof. Arjun Rao Kuthadi
Dept.of.History
Osmania University
Hyderabad-500007, T.S.

UNIT III **6hrs**

IMPACT OF WEST AND REFORM MOVEMENTS

- Influence of Western culture on Indian Society
- 19th century Socio Religious Reform Movement –Raja Ram Mohan Roy, Ishwara Chandra Vidyasagar and Veerasalingam
- Subaltern Movements in India– Jyothirao Phule-Savitribai Phule, E.V Ramaswamy Naikar –Narayana Guru-Dr.B.R.Ambedkar
- Indian National movement-Moderate, Extremist and Gandhian Era

UNIT IV **6hrs**

RELIGION AND COSTITUTIONAL INSTITUTIONS

- Perceptions of all major religions-a critical analysis
- Rise of communalism in Indian society
- Democratic system in India and its functions-Evolution of the constitution and organs of democracy

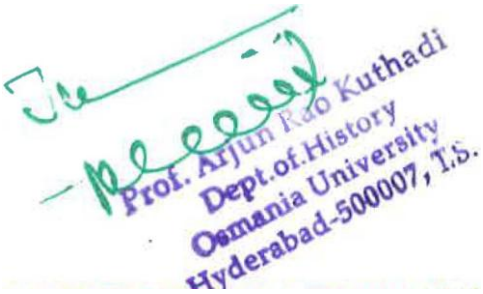
UNIT V **6hrs**

SOCIAL GROUPS AND RIGHTS

- Fundamental rights,
- Women, Children and LGBTQ
- Tribal Culture-their issues

REFERENCE BOOKS

1. Jha, Dr K.N. 2006. **Studies in ancient & Medieval India**. COSMOS Book hive Ltd: Gurgaon.
2. Mahajan, V.D. 2008. **Ancient India**. S.Chand, New Delhi.
3. Manasseh, Dr P. 2010. **An Overview of Indian Culture**. Gamaleil Publishers, Hyderabad.
4. Malpani, Madanlal & Malpani, Shamsunder. 2014. **Indian Heritage and Culture**. Kalyani Publishers, Ludhiana.
5. Mhaske, Dr R.H. 2012. **Human Rights, Social Justice and Political Challenges**. Chandralok Prakashau, Kanpur.
6. Singh, Gurdip & Ahuja, V.K. 2012. **Human Rights in 21st Century**. Universal Law Publisher, New Delhi.



IT HARDWARE AND NETWORKING

Credits : 4 **Semester: II**
Course Code: CSCC22201 **No. of Lecture Hours: 60**

Objectives:

- To know the inner working of a PC. Helps to learn how to maintain, upgrade and troubleshoot a PC.
- To know about areas of system improvement such as motherboards, I/O devices, Storage devices.
- To learn and Implement topologies using NS3

Course Outcomes:

CO1: Identify Motherboard and its components.
CO2: Explain the working of various storage devices
CO3: Analyze the working of Power supply devices
CO4: Identify different types of networking devices
CO5: Implement different types of Topologies

UNIT –I	**12Hrs**
1. Motherboard characteristics, Choosing a Right Motherboard	2
2. Installation of new Motherboard , Study of CMOS ROM BIOS	2
3. Upgrading PC BIOS. Intro to Multi-core processors,	2
4. Expansion Bus slots PCI-Express,SCSI, NIC, USB, FIREWARE (IEEE 1394).	2
5. KEYBOARDS: Keyboards switch types, choosing a KB, Configuring	2
6. MOUSE :Different types of mouse, Construction of mouse ,working principle	2

UNIT –II	**12Hrs**
1. Wireless input devices- Power Management Features of Wireless Input Devices, Troubleshooting Wireless Input Devices	2
2. PRINTERS: Interfaces, Block diagrams, components	2
3. Working principle of DMP, Inkjet and Laser Printers.	3
4. HDD: Different capacities of HDD, working principle, Interfaces, Cables	2
5. DVD: working principles, Disk layout, Introduction to Blue ray discs.	3

UNIT –III	**12Hrs**
1. Flash memory devices :types, comparison, flash card readers, Troubleshooting of Optical Drives	3
2. Study of SMPS –Block diagram , Components and Working Principle, Power connectors and color coding of cables	3
3. Backup power supplies: Types, Characteristics and Factors Considered in Choosing UPS	3
4. Study of Memory modules SDRAM, DDR-I, II & III RAM.	2
5. System Assembly and Disassembly	1

UNIT-IV **12Hrs**

1. Local Area Networking-defining a network, types of network, Requirements of network 2
2. Client/server versus peer network, network architecture overview 2
3. HUB: types, working principle 2
4. SWITCH: types, working principle and configuration 2
5. MODEM: types, Characteristics, working principle and configuration. 2
6. ROUTERS: types and classification of Routers. 2

UNIT-V **12Hrs**

1. Introduction to Network Simulator, Architecture and Installation of NS3 2
2. Building ,Testing and running a NS3 Script 2
3. Key Abstractions: Node, Applications, Channel, Net Device, Module Includes, Namespace, 2
4. Main Function, Simulator, Net Device Container 2
5. Point-to-Point Helper, InternetStackHelper, Ipv4AddressHelper 2
6. Building Topologies: Star and Bus , Connecting Nodes 2

ESSENTIAL READING

1. Mueller Scott, M. 2015. **Upgrading and Repairing PCs**. 22nd Edition. USA: Pearson Education
2. Thompson Robert and Thompson Fritch man, Bruce. 2009. **PC Hardware in a Nutshell.** 4th Edition. O'Reilly Media.
3. https://www.nsnam.org/docs/tutorial/html/building-topologies.html

SUGGESTED READING

1. Meyers Mike. 2012. **Managing and Troubleshooting PCs.** 4thEdition. New Delhi: McGraw Hill

MATHEMATICS –II
(VECTOR CALCULUS & MATRICES)

Credits : 4 **Semester: II**
Course Code: BS18201 **No. of Lecture hours:75**

Course Objective:

- To give the knowledge of central concepts in multivariable analysis, including directional derivative, gradient, line and surface integrals, vector fields, divergence, curl and the theorems of Green and Stokes, and the divergence theorem and some important applications of Matrices.

Course Outcomes: Upon completing this course, students will be able to:

CO1: **Apply** the vector differential operator to scalar and vector functions,
CO2: **Determine** gradient vector fields and find potential functions
CO3: **Evaluate** line, surface & volume integrals by Greens, Gauss and Stoke's theorems.
CO4: Understand to find the rank of a matrix and to solve systems of linear equations applying matrix techniques.
CO5: Determine eigenvalues and eigenvectors of a given matrix and to **apply** these concepts to quadratic forms.

UNIT- I **15Hrs**

Vector Calculus: I

1. Vector Differentiation and the necessary and sufficient condition for a vector function to have constant magnitude and constant direction. 5
2. Vector Continuity- Differentiability- Vector Integration 5
3. Gradient – Directional derivative of a scalar function- Equation of the Tangent and normal to a surface 5

UNIT II **15Hrs**

Vector Calculus: II

1. Divergence and Curl operators 5
2. Formulae involving these operators 5
3. Vector Identities- Simple problems there on 5

UNIT-III

Vector Calculus: III **15Hrs**

1. Line Integrals-Surface integrals- Volume integrals 5
2. Green's theorem ,Gauss theorem, Stoke's Theorem (Without proofs) 5
3. Problems on Green's theorem ,Gauss theorem, Stoke's Theorems 5

UNIT IV **15 Hrs**

Rank of a Matrix- System of Linear Equations

1. Rank Of a Matrix Rank-Echelon form 5
2. Normal form – Solution of Linear Systems 5
3. Homogeneous and non Homogeneous Equations. 5

UNIT V **15 Hrs**

Eigen values - Eigen vectors

1. Eigenvalues-Eigenvectors–Properties–Cayley-Hamilton Theorem 5
2. Inverse and powers of a matrix by using Cayley-Hamilton theorem 5
3. Quadratic forms- Reduction of quadratic form to canonical form 5

ESSENTIAL READING

1. Vasistha, A.R and Dr.Agarwal, D.C. 2015. **Vector Calculus**. 9th Edition. Meerut: Krishna Publications. (For UNITS I, II, III)
2. Vasistha, A.R and Vasistha, A.K.2014.**Matrices**. Meerut : Krishna Prakashan Media (For UNITS-IV andV)
3. Vector Calculus – Telugu Akademi

COMPUTER NETWORKS

Credits : 4 **Semester: II**
Course Code: CSCC22202 **No. of Lecture hours:60**

Objectives:

- To familiarize with fundamental concepts of computer network.
- To gain expertise in various layers of the TCP/IP model.

Course Outcomes: Students will be able to

CO1: Understand and identify basic computer network topologies and protocols and explainData Communication System components.
CO2: Describe the functions of each layer in OSI model and its protocols.
CO3: Classify different error detecting techniques.
CO4: Build skills of sub-netting and routing mechanisms.
CO5: Classify the routing protocols and analyze how to assign the IP addresses for the givennetwork.

UNIT-I **12Hrs**

Introduction:

1. Data Communications, Networks, Protocols and Standards	2
2. OSI Model, Layers in OSI Model, TCP/IP Protocol Suite	2
3. Analog and Digital, Transmission Impairments	2
4. Transmission Media-Guided media, Connecting Devices (Hubs, Repeaters, Bridges, Routers-Only Definitions)	2
5. Digital Transmission-Digital-to-Digital Conversion	2
6. Multiplexing: Frequency-Division, Wavelength and Time Division	2

UNIT-II **12Hrs**

Data Link Layer:

1. Error Detection and Correction-Parity, Check Sum, CRC, Hamming Code	3
2. Data Link Control: Framing, Flow and Error Control	2
3. Stop-and-Wait ARQ, Go-Back-N ARQ, Selective Repeat ARQ, Piggybacking	2
4. HDLC, Random Access- ALOHA, CSMA, CSMA/CD, CSMA/CA	3
5. Wired LANs- Ethernet	2

UNIT-III **12Hrs**

Network Layer:

1. IP address Space-Introduction	2
2. Classful and Classless addressing, Subnetting and Supernetting	2
3. IPv4- datagram, Fragmentation, checksum, options	2
4. Internet Control Protocols- ICMP, IGMP, ARP and RARP	3
5. Delivery, Forwarding, Routing protocols-Distance Vector Routing	3

UNIT-IV **12Hrs**

Transport Layer:

1. Process-to-Process Delivery, UDP-Well Known Ports, User Datagram, Checksum 2
2. UDP Operation, use of UDP 2
3. TCP- process to process communication, Numbering bytes, TCP services 2
4. Flow control- silly window syndrome, Error Control 3
5. TCP connection, State transition diagram, Congestion control, Timers, Options 3

UNIT-V **12Hrs**

Application Layer:

1. DNS- Namespace, Domain Name Space, Distribution of Name Space 2
2. DNS in Internet, Resolution, DNS Messages, Types of Records 2
3. TELNET, E-mail Architecture, Message Transfer Agent: SMTP 3
4. Message Access Agent: POP, FTP 2
5. WWW and HTTP- architecture, web documents, HTTP 3

ESSENTIAL READING

1. Forouzan, Beharouz A. 2011. **Data Communications and Networking**. 3rd Edition. New Delhi:Tata Mc Graw Hill. (UNIT- I and II)
2. Forouzan, Beharouz A. 2010. **TCP/IP Protocol Suite**. 3rd Edition. New Delhi: Tata McGraw Hill. (UNIT-III,IV,V)

SUGGESTED READING

1. Tanenbaum, Andrew S. 2008. **Computer Networks**. 4th Edition. New Delhi: PearsonEducation.

DATA STRUCTURES THROUGH 'C'

Credits : 4 **Semester: II**
Course Code: BS18202 **No. of Lecture Hours: 75**

Objective:

- To focus on different methods of sorting, searching, storing data and understandingtime and storage efficiency.

Course Outcomes: Students will be able to

COl: Choose appropriate data structures to represent data items in real world problems
CO2: Illustrate non-linear data structures like linked list
CO3: Organize the data using sorting in various linear data structurescomplexity
CO4: Construct data with nonlinear data structure using trees.
COS: Explain the concept of graphs and b trees

UNIT-I **15 HRS**

1. Introduction to data structures 1
2. Stacks 5
   a. Definition and various operations performed on Stacks
3. Queues 5
   a. Definition and various operations performed on Queues
4. Stack Applications 4
   a. Notations – Prefix, Postfix, Infix
   b. Conversions – Infix to Postfix, Infix to Prefix

UNIT-II **15 HRS**

1. Data Representation, Concept of Linked List 2
2. Advantages of Linked List and types of Linked List 1
3. Singly Linked List 5
   a. Various operations performed on singly linked list
4. Doubly Linked List 5
   a. Various operations performed on doubly linked list
5. Circular Linked List 1
6. Applications of Linked List 1

UNIT-III **15 HRS**

1. Trees
   a. Definition and properties 2
2. Binary Trees
   a. Definition and Representation of Binary trees 2
   b. Operations – Insertion, Deletion, Searching 2
   c. Tree traversal techniques – in order, pre order, post order 3

3. AVL Tress
    a. Definition and representation of AVL trees 3
    b. Operations on AVL trees – Insertion, Deletion 3

UNIT-IV **15 HRS**

1. Sorting Methods
    a. Bubble Sort 2
    b. Insertion Sort 2
    c. Selection Sort 2
    d. Quick Sort 2
    e. Merge Sort 2
2. Searching Methods
    a. Linear Search 2
    b. Binary Search 2
3. Comparison and analysis 1

UNIT-V **15 HRS**

1. Graphs
    a. Terminology and Representation 1
    b. Definition and representation of graph 2
    c. Graph Traversal – BFS, DFS 3
2. B-Trees
    a. Definition and representation of B-Trees 2
    b. Operations on B-Trees – Insertion, Deletion, Search 2
3. File Structures – Physical Storage Media, File Organization 2
    Sequential files, Indexing and Hashing, Primary Indices, Secondary Indices 2
    Indexing and Hashing comparisons 2

ESSENTIALREADING

1. Kanetkar,Yashvanth. 2008. **Data Structures through C.** India: BPB Publications.
2. Tanenbaum, A.M. Langsam, Y. Augenstein,M.J. **Data Structures Using C.** New Delhi: Pearson Education.

SUGGESTED READING

1. Balagurusamy, E. **C Programming & Data Structures.** Tata McGraw Hill.
2. Krishna Moorthy, R. lndirani Kurnaravei G. 2008. **Data Structures Using C.** TataMcGraw Hill Publishing Company Ltd.

IT HARDWARE AND NETWORKING LAB

Credits : 1 **Semester: II**
Course Code: CSCC22203 **No. of Practical Hours: 30**

Objectives:

- To identify various components of PC.
- To learn installation of windows and Linux operating system.
- To install various application software's.

Course Outcome:

- Students will be able to identify and maintain different PC hardware components and peripherals

	Topics	No. Of Hours
1.	Identification of latest motherboards, memory modules and I/O Cards.	2
2.	Assembling a PC.	2
3.	Installation of Windows 7 and Windows Server 2012	2
4.	Installation of Red Hat Linux Server-6.0.	2
5.	Installation of Ubuntu 14.04 in Virtual box.	2
6.	Trouble Shooting the PC system.	2
7.	Working with Switch, Hub and Router in simulator (Packet Tracer)	2
8.	Building a Network using Simulator (Packet Tracer).	2
9.	Sharing data between Host and Virtual Machine in Virtual Box.	2
10.	Sharing Data between Windows and Linux Machines.	2
11.	Creating a Client Server Model in Virtual Box.	2
12.	Installation of NS3 in Linux	2
13.	Program in NS3 to connect two nodes	2
14.	Program in NS3 for connecting three nodes considering one node as a central node.	2
15.	Program in NS3 to implement star and bus topology	2

COMPUTER NETWORKS LAB

Credits : 1 **Semester: II**
Course Code: CSCC22204 **No. of Practical Hours: 30**

Objective:

- To study the functioning of various digital modules and build data processing circuits such as arithmetic circuits, comparators, encoders, decoders, multiplexers, de-multiplexers, register, counters.

Course Outcome:

- Students will be able to construct and analyze various combinational and sequential circuits used in digital data processing/design of digital computers.

	Programs	No. of Hours
1.	To Study different types of transmission media	2
2.	To study quadrature phase shifting key modulation	2
3.	Study and Analysis of QAM Modulation	2
4.	To Study LAN using star topology	2
5.	To Study LAN using bus topology	2
6.	To Study LAN using ring topology	2
7.	To study configure modem of computer	2
8.	To configure hub/switch	2
9.	To study interconnection of cables for data communication	2
10.	To study fibre optic communication	2
11.	To study wireless communication	2
12.	To study PC-PC communication using parallel port	2
13.	To study PC-PC communication using LAN	2
14.	To create a network using Bluetooth	2
15.	Troubleshooting tools in Data Communications	2

DATA STRUCTURES THROUGH C PRACTICALS

Credits : 1 **Semester : II**
Course Code: CSCC22205 **No. of Practical Hours: 30**

Objective:
- To develop applications using data structure concepts.

Course Outcome:
- Students will be able to identify, design, implement, test and debug the appropriatedata structure for a given problem

	Programs	No. Of Hours
1.	Program to perform linear search	1
2.	Program to implement binary search	1
3.	Program to implement bubble sort	1
4.	Program to implement insertion sort	1
5.	Program to implement selection sort	1
6.	Program to implement quick sort	1
7.	Program to implement merge sort on 2 sorted lists	1
8.	Program to implement stack operations using array	1
9.	Program to implement queue operations using array	1
10.	Program to implement stack operations using linked list	1
11.	Program to implement queue operations using linked list	1
12.	Program to convert infix expression to postfix	2
13.	Program to convert infix expression to prefix	2
14.	Program to evaluate a postfix expression	1
15.	Program to create a linked list	1
16.	Programs to perform insertion and deletion operations on the linked list	2
17.	Program to concatenate two lists	1
18.	Program to copy a list into another list	1
19.	Program to split a list into two linked lists	1
20.	Program to search for a node in the list.	1
21.	Program to find the number of elements in the list	1
22.	Program on insertion and deletion operations on doubly linked list	2
23.	Program to illustrate tree traversal techniques.	2
24.	Program to illustrate graph traversals	2