SEMESTER- I					
Allied – I Mathematics for Computer Science					
Course Code: 21UCSA11	Hrs / week :3	Hrs / Semester: 45	Credits :3		

- To attain mathematical foundations this is very essential for the study of computer courses.
- To make the students capable of mathematically formulating certain practical problems.
- To understand the concept of central tendencies
- To learn about dispersions and regression
- To provide knowledge about graphs and its applications.

Course Outcomes:

CO.No	Upon completion of this course, students will be able to	PSOs addressed	CL
CO-1	create an argument using logical notation and evaluate if it is valid or not.	1	Cr
CO-2	apply logical reasoning to solve a variety of problems.	4	Ар
CO-3	compute measures of central tendency	4	Ар
CO-4	calculate and compare dispersion, Skewness, kurtosis	4	An
CO-5	compute the shortest path	1	An
CO-6	model problems in computer science using graphs and solve problems using graphs	1	Ар

SEMESTER- I				
Allied – I	Mathematics for	Computer Science		
Course Code:21UCSA11	Hrs / week :3	Hrs / Semester: 45	Credits :3	

Unit I:

Logic And Propositional Calculus– Introduction – propositions and compound propositions – tautologies and contradictions – logical equivalences– algebra of propositions – conditional and bi-conditional statements – arguments – logical implication – prepositional functions, Quantifiers – Negation of quantified statements.

Self-Learning: Basic Logical operations and truth tables

Unit II:

Measures of central tendency:

Arithmetic mean, Median, Mode, Geometric mean, Harmonic mean. Partition values: Quartiles, Deciles and percentiles.

Self -Learning: Types of Data, Organizing data

Unit III:

Measures of dispersion:

Mean deviation, Quartile deviation, Standard deviation, Coefficient of variation, measures of skewness, Kurtosis.

Self-Learning: Lorenz Curve

Unit IV:

Correlation and Regression:

Correlation: Karl Pearson coefficient of correlation, Spearman's rank correlation coefficient.**Regression**: Concept of errors, Principles of Least Square, Simple linear regression and its properties.

Self-Learning: Scatter plot, Temporal autocorrelation, spatial autocorrelation

Unit V:

Graph Theory

Introduction, data structures – graphs and multigraphs – subgraphs, Isomorphic and homeomorphic graphs – paths, connectivity – the bridges of konigsberg, traversable multigraphs – labelled and weighted graphs – complete, regular, and bipartite graphs – tree graphs.**Directed Graphs :** Introduction- Directed Graphs- Basic Definitions- Rooted Trees. **Self-Learning:** Spanning tree

Text Books:

- 1. Seymour Lipschutz, Marc Lipson, *DiscreteMathematics*, New Delhi : Tata McGraw Hill, RevisedThird Edition, 2017. (Unit I and Unit V)
- 2. Gupta S.C and Kapoor V.K, *Fundamentals of Mathematical Statistics*, New Delhi : Sultan Chand &Sons,11th edition, 2014 (Unit II, Unit III, Unit IV)

Books for Reference:

- 1. B.S. Vatsa, *Discrete Mathematics*, New Delhi: New Age International (P) Ltd., Fourth Edition, 2009.
- 2. K.D. Joshi, *Foundation of Discrete Mathematics*, New Delhi: New Age International (P) Ltd., 2014
- 3. Kenneth H. Rosen , "Discrete mathematics and its application", New Delhi : Tata McGraw Hill,8th Edition, 2021
- 4. Mukhopadhyay P, *Mathematical Statistics*, Kolkata :Books and Allied (P) Ltd, 2015.
- 5. Agarwal B.L, *Basic Statistics*, 6th Edition, New Delhi: New Age International (P) Ltd., 2015.

SEMESTER II					
Allied II	Digital Electronics				
Course Code: 21UCSA21	Hrs / week : 3	Hrs /Semester:45	Credits : 3		

- To Understand the basic concepts used in the design and analysis of digital systems
- To study various Boolean Functions
- To study about number systems
- To Construct digital circuits
- Acquire knowledge in Boolean functions and MSI and LSI logic circuits.

Course Outcome:

CO No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand various number systems and boolean functions.	1	Un
CO-2	apply various methods to simplify boolean function.	4	Cr
CO-3	construct digital circuits for boolean functions with logic gates.	6	Cr
CO-4	design combinational circuits with logic gates.	6	Cr
CO-5	apply classical techniques for the logical design of combinational and sequential circuits	4	Ар
CO-6	define sequential logic circuits.	1	Re
CO-7	understand the basic operation of flip-flops.	1	Re
CO-8	understand the various registers-transfer methods .	1	Re

SEMESTER- II				
Allied II Digital Electronics				
Course Code: 21UCSA21	Hrs / week : 3	Hrs / Semester: 45	Credits : 3	

Unit I

Binary Systems :Digital Computers and Digital Systems – Binary numbers – Number base conversion – Octal and Hexadecimal numbers – Complements– Binary Codes –Basic theorems and properties of boolean algebra– Boolean functions– Canonical and Standard forms . **Self Learning :** Digital Logic Gates .

Unit II

Simplification of Boolean Functions : The Map method – Two and Three variable Maps – Four Variable Map– Five and Six Variable Maps – Product of Sums Simplification – NAND and NOR Implementation– Don't care conditions – The Tabulation method – Determination of Prime – Implicants – Selection of Prime – Implicants

Unit III

Combinational Logic :Introduction– Design Procedure – Adders – Subtractors – Code Conversion– Multilevel NAND Circuits – Multilevel NOR Circuits – Exclusive-OR and Equivalence Functions.

Unit IV

Combinational Logic with MSI and LSI :Introduction– Binary Parallel Adder – DecimalAdder– Magnitude Comparator– Decoders – Multiplexers **Unit V**

Registers and Counters: Sequential logic -Introduction – Flip-Flops -Basic Flip-Flop Circuit-Clocked RS Flip-Flop-D-Flip-Flop-JK Flip-Flop- T-Flip-Flop- Registers – Shift Registers **Self-Learning:** Counters

Text Book :

1. M. Morris Mano, *Digital Logic and Computer Design*, Noida: Pearson education India, First Edition, 2016

Chapters: 1.2-1.6, 2.3-2.5, 2.7, 3.1-3.11, 4.1-4.5, 4.7-4.9, 5.1-5.6, 6.1, 6.2, 7.1-7.3

Books for Reference:

- 1. Charles H.Roth, Jr. *Fundamentals of Logic Design*, New Delhi: Cengage Learning India Private Limited, 7th Edition, 2015
- 2.DonaldD.Givone, *Digital Principles and Design*, New Delhi: Tata McGraw-Hill, First Edition,2012.
- 3. Donald P.Leach and Albert Paul Malvino, *Digital Principles and Applications*, New Delhi: Tata McGraw Hill, 8th Edition, 2014.

SEMESTER- II					
Allied-Practical II O	Allied-Practical II Open Source Multimedia Lab				
Course Code: 21UCSAR2	Hrs / week :3	Hrs / Semester: 45	Credits :2		

(GIMP)

- 1. Design a brochure.
- 2. Design greeting card.
- 3. Design a Textbook cover page.
- 4. Filters in GIMP
- 5. Design a homepage for a website
- 6. Design a visiting card.
- 7. Design a Bio data form
- 8. Design a CD label.
- 9. Create 2D logos.
- 10. Animate a candle flame using Liquefy filter.

SEMESTER- I					
Skill Enhancement Course-I Professional English for Computer Science –I					
Course 21UCSPE1	Code:	Hrs / week :2	Hrs / Semester: 30	Credits :2	

- To develop the language skills of students
- To train students in professional contexts.
- To enhance the lexical, grammatical and socio-linguistic skills
- To improve communicative competence of students

Course Outcomes:

CO.No		PSOs	CL
	Upon completion of this course, students will be able to	addressed	
CO-1	recognise their own ability to improve their own competence in using the language	7	Un
CO-2	use language for speaking with confidence in an intelligible and acceptable manner.	3	An
CO-3	understand the importance of reading for life	3	Un
CO-4	write simple sentences without committing error of spelling or grammar	7	An
CO-5	develop critical thinking skills and get culturally aware of the target situation	4	Cr
CO-6	develop communicative skill for professional collaboration	7	Cr

NB: All four skills are taught based on texts/passages.

SEMESTER- I					
Skill Enhancement Course-I Professional English for Computer Science –I					
Course 21UCSPE1	Code:	Hrs / week :2	Hrs / Semester: 30	Credits :2	

UNIT 1: COMMUNICATION

Listening: Listening to audio text and answering questions- Listening to Instructions **Speaking**: Pair work and small group work.

Reading: Comprehension passages –Differentiate between facts and opinion

Writing: Developing a story with pictures.

Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 2: DESCRIPTION

Listening: Listening to process description.-Drawing a flow chart.

Speaking: Role play (formal context)

Reading: Skimming/Scanning-Reading passages on products, equipment and gadgets.

Writing: Process Description –Compare and Contrast Paragraph-Sentence Definition and Extended definition- Free Writing.

Vocabulary: Register specific -Incorporated into the LSRW tasks.

UNIT 3: NEGOTIATION STRATEGIES

Listening: Listening to interviews of specialists / Inventors in fields (Subject specific) Speaking: Brainstorming.(Mind mapping). Small group discussions (Subject- Specific) Reading: Longer Reading text. Writing: Essay Writing (250 words)

Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 4: PRESENTATION SKILLS

Listening: Listening to lectures.Speaking: Short talks.Reading: Reading Comprehension passagesWriting: Writing Recommendations Interpreting Visuals inputsVocabulary: Register specific -Incorporated into the LSRW tasks

UNIT 5: CRITICAL THINKING SKILLS

Listening: Listening comprehension- Listening for information. **Speaking:** Making presentations (with PPT- practice).

Reading: Comprehension passages –Note making.

Comprehension: Motivational article on Professional Competence, Professional Ethics and Life Skills)

Writing: Problem and Solution essay– Creative writing –Summary writing Vocabulary: Register specific - Incorporated into the LSRW tasks

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SEMESTER- II					
Skill Enhancem	Skill Enhancement Course-II Professional English for Computer Science –II				
Course 21UCSPE2	Code:	Hrs / week :2	Hrs / Semester: 30	Credits :2	

- To improve the communicative skill of students by refining their speaking, writing, reading, and listening skills.
- To make students competent in professional communication.
- To attain necessary skills to face interviews.

Course Outcome:

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand the basic objective of the course and obtain strong professional vocabulary for its application at different platforms	7	Un
CO-2	apply the knowledge for writing purposes such as Presentation, drafting and project report etc.	5	Ap
CO-3	evaluate the correct and error-free writing by being well- versed in rules of English grammar and cultivate relevant technical style of communication and presentation.	7	Ev
CO-4	apply techniques for developing inter-personal communication and to respond questions at a formal interview	5,7	Ap
CO-5	apply critical thinking skills to face everyday life situations.	4	Ар
CO-6	develop strategic competence that will help in efficient communication	3, 7	Ар

SEMESTER- II				
Skill Enhancement Course-II Professional English for Computer Science –II				
Course 21UCSPE2	Code:	Hrs / week :2	Hrs / Semester: 30	Credits :2

UNIT 1: COMMUNICATIVE COMPETENCE

Listening and Speaking:

Listening and responding to complaints (formal situation) Listening to problems and offering solutions (informal)

Reading and writing:

Reading aloud (brief motivational anecdotes)

Writing a paragraph on a proverbial expression/motivational idea.

Word Power/Vocabulary:

Synonyms & Antonyms

Grammar in Context:

Adverbs, Prepositions.

UNIT 2: PERSUASIVE COMMUNICATION

Listening and Speaking:

Listening to famous speeches and poems

Making short speeches- Formal: welcome speech and vote of thanks.

Informal occasions- Farewell party, graduation speech

Reading and Writing:

Writing opinion pieces (could be on travel, food, film / book reviews or on any contemporary topic)

Reading poetry

Reading aloud: (Intonation and Voice Modulation)

Identifying and using figures of speech - simile, metaphor, personification etc.

Word Power/Vocabulary:

Idioms & Phrases

Grammar in Context

Conjunctions and Interjections.

UNIT 3: DIGITAL COMPETENCE

Listening and Speaking:

Listening to Ted talks

Making short presentations – Formal presentation with PPT, analytical presentation of graphs and reports of multiple kinds Interactions during and after the presentations

Reading and writing:

Writing emails of complaint

Reading aloud famous speeches

Word Power/Vocabulary:

One Word Substitution

Grammar in Context:

Sentence Patterns

UNIT 4: CREATIVITY AND IMAGINATION

Listening and Speaking

Participating in a meeting: face to face and online

Listening with courtesy and adding ideas and giving opinions during the meeting and making concluding remarks.

Reading and Writing

Reading visual texts – advertisements

Writing a Brochure

Word Power/Vocabulary:

Denotation and Connotation

Grammar in Context:

SentenceTypes.

UNIT 5: WORKPLACE COMMUNICATION & BASICS OF ACADEMIC WRITING

Listening and Speaking:

Informal interview for feature writing

Listening and responding to questions at a formal interview

Reading and Writing

Writing letters of application

Readers' Theatre (Script Reading)

Dramatizing everyday situations/social issues through skits. (Writing scripts and forming)

performing)

Word Power/Vocabulary:

Collocation

Grammar in Context:

Working With Clauses.

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