E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

NAGAPATTINAM – 611002

(Affiliated to Anna University, Chennai | Accredited by NAAC with 'A++' Grade|Accredited by NBA T1(B.E. – CSE, CIVIL, ECE, EEE, MECH& B.Tech – IT) | Approved by AICTE, New Delhi)

B.TECH – COMPUTER SCIENCE & BUSINESS SYSTEMS R – 2023

THIRD YEAR

CURRICULUM AND SYLLABUS FOR FIFTH SEMESTER

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	C	MAX. MARKS		
							CA	ES	TOTAL
Theory Courses									
2302BS501	Software Design with UML	PCC	3	0	2	4	50	50	100
2302BS502	Compiler Design	PCC	3	0	2	4	50	50	100
2302BS503	Fundamentals of Management	PCC	3	0	0	3	40	60	100
2302BS504	Business Strategy	PCC	3	0	0	3	40	60	100
	Elective I	PEC	3	0	0	3	40	60	100
	Elective II	PEC	3	0	0	3	40	60	100
2301BS551	Business Communication & Value Science – III	HSMC	0	0	4	2	100	0	100
2301LS501	Life skill – V	MC	0	0	0	0	0	0	0
TOTAL			**18**	**0**	**8**	**22**	**360**	**340**	**700**

L-Lecture |T –Tutorial |P- Practical |CA – Continuous Assessment |ES – End Semester

2302BS501 SOFTWARE DESIGN WITH UML + LAB

L	T	P	C
3	0	2	3

PREREQUISITE:

Software Engineering

COURSE OBJECTIVES:

1. To understand the fundamentals of Object Modeling and UML Language.
2. To discover requirements analysis using Case Modeling.
3. To implement the design using interaction diagrams.
4. To create the logical view of design stage using static UML diagrams
5. To design the system using dynamic models.

COURSE OUTCOMES:

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

CO1: Describe the fundamentals of software development process and object oriented technologies.
CO2: Identify an appropriate design pattern.
CO3: Explain OOAD systematic concepts and sketch the various UML diagrams.
CO4: Illustrate the logical view design diagrams.
CO5: Apply the knowledge of Technical stack diagrams to generate skeleton code to implement.

COs Vs POs MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	2	-	-	-	-	-	-	-	-	1	2	0	2
CO2	1	1	3	2	-	-	-	-	-	-	2	2	2	2	2
CO3	2	2	3	-	2	-	-	-	-	-	-	2	2	2	2
CO4	1	1	2	-	-	-	-	-	-	-	-	-	2	2	2
CO5	1	1	3	-	2	-	-	-	-	-	-	1	2	2	3

COURSE CONTENTS:

MODULE I INTRODUCTION TO OBJECT ORIENTED TECHNOLOGIES 9 Hours

Software development process: The Waterfall Model vs. The Spiral Model - The Software Crisis, description of the real world using the Objects Model. - Classes, inheritance and multiple conigurations. - Quality software characteristics - Description of the Object-Oriented Analysis process vs. the Structure Analysis Model

MODULE II INTRODUCTION TO THE UML LANGUAGE AND DESIGN PATTERNS 9 Hours

Standards - Elements of the language. - General description of various models - 93 Syllabus CSBS The process of Object-Oriented software development. - Description of Design Patterns - Technological Description of Distributed Systems.

MODULE III BUSINESS MODEL DIAGRAMS 9 Hours

Requirements Analysis Using Case Modeling - Analysis of system requirements - Actor definitions. - Writing a case goal - Use Case Diagrams. - Use Case Relationships. Dynamic Model: State Diagram / Activity Diagram Description of the State Diagram - Events Handling - Description of the Activity Diagram - Exercise in State Machine - Case studies to implement in design lab.

MODULE IV THE LOGICAL VIEW DESIGN DIAGRAMS 9Hours

Transfer from Analysis to Design in the Characterization Stage: Interaction Diagrams - Description of goal - Defining UML Method, Operation, Object Interface, Class - Sequence Diagram - Finding objects from Flow of Events - Describing the process of finding objects using a Sequence Diagram - Describing the process of finding objects using a Collaboration Diagram –Mapping use case to sequence diagram - The Static Structure Diagrams. - The Class Diagram Model - Attributes descriptions - Operations descriptions - Connections descriptions in the Static Model - Association, Generalization, Aggregation, Dependency, Interfacing, Multiplicity- Case studies to implement in design lab.

MODULE V TECHNICAL STACK DIAGRAMS 9Hours

Package Diagram Model - Description of the model. - White box, black box - connections between packagers - Interfaces - Create Package Diagram - Drill Down - Component Diagram Model - Physical Aspect - Logical Aspect - Connections and Dependencies - User face - Initial DB design in a UML environment. - Deployment Model - Processors - Connections - Components - Tasks - Threads - Signals and Events. – Mapping class diagram to create skeleton code to implement - Case studies to implement in design lab.

TOTAL: 45HOURS

LIST OF EXPERIMENTS:

1. Students Marks Analyzing System
2. Online Quiz System
3. Online Railway Ticket Reservation System
4. Payroll Processing System
5. Course Registration System
6. Expert System for Medical Diagnosis System
7. ATM Systems
8. Stock Maintenance
9. Library Management System
10. Passport Automation System

REFERENCES:

1. Erich Gamma, Richard Helm, Ralph Johnson, and John M. Vlissides, "Design Patterns: Elements of Reusable Object-Oriented Software" Addison-Wesley Professional, 1994.

2. Ali Bahrami, "Object Oriented Systems Development", McGraw Hill Edition, 2017.

3. Bernd Bruegge and Allen H. Dutoit, "Object-Oriented Software Engineering: using UML, Patterns, and Java", Third Edition, Prentice Hall, 2010.

4. https://www.umsl.edu/~sauterv/analysis/488_f01_papers/ quillin.htm.

5. https://medium.com/omarelgabrys-blog/object-oriented-analysisand-design-introduction-part-1-a93b0ca69d36

2302BS502 **COMPILER DESIGN** **L T P C**
3 0 2 3

PRE-REQUISITE:

Formal Languages and Automata Theory

COURSE OBJECTIVES:

1. To learn the design principles of a Compiler.
2.To learn the various parsing techniques and different levels of
3.To learn how to optimize and effectively generate machine codes.
4.To learn to implement Architecture dependent code improvement

COURSE OUTCOMES:

On the successful completion of the course, students will be able to
CO1: Interpret the different phases of compiler.
CO2: Analyze a lexical analyzer for a sample language.
CO3: Apply different parsing algorithms to develop the parsers for a given grammar
CO4: Explain code optimization techniques and a simple code generator.

COs Vs POs MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2	2	2	-	-	-	-	-	-	2	2	2	2
CO2	2	2	2	2	-	-	-	-	-	-	2	2	2	2
CO3	2	2	2	2	-	-	-	-	-	-	2	2	2	2
CO4	2	2	2	2	-	-	-	-	-	-	2	2	2	2

COURSE CONTENTS:

MODULE I INTRODUCTION **9 Hours**
Phases of compilation and overview. Lexical Analysis (scanner): Regular languages, finite automata, regular expressions, relating regular expressions and finite automata, scanner generator(lex,flex).

MODULE II SYNTAX ANALYSIS **9 Hours**
Parser: Context-free languages and grammars, push-down automata, LL(1) grammars and top-down parsing, operator grammars, LR(O), SLR(1), LR(1), LALR(1) grammars and bottom-up parsing, ambiguity and LR parsing, LALR(1) parser generator (yacc,bison).

MODULE III SEMANTIC ANALYSIS **9 Hours**
Attribute grammars, syntax directed definition, evaluation and flow of attribute in a syntax tree. Symbol Table: Basic structure, symbol attributes and management. Run-time environment: Procedure activation, parameter passing, value return, memory allocation, scope. Intermediate Code Generation: Translation of different language features, different types of intermediate forms

MODULE IV CODE IMPROVEMENT **9 Hours**
Control-flow, data-flow dependence etc.; local optimization, global optimization, loop optimization, peep-hole optimization etc

MODULE V ARCHITECTURE DEPENDENT CODE IMPROVEMENT **9 Hours**
Instruction scheduling (for pipeline), loop optimization (for cache memory) etc. Register allocation and target code generation. Advanced topics: Type systems, data abstraction, compilation of Object-Oriented features and non-imperative programming languages.

TOTAL: 45 HOURS

LIST OF EXPERIMENTS
EXPERIMENT 1 **3 Hours**

Implementation of lexical analyzer using C and LEXTOOL.

EXPERIMENT 2 **3 Hours**

Implementation of a calculator that takes an expression (with digits, + and *), computes and prints its value, using YACC.

EXPERIMENT 3 **3 Hours**

Implementation of a parser using LEX and YACC.

EXPERIMENT 4 **3 Hours**

Implementation of symbol table

EXPERIMENT 5 **3 Hours**

Implementation of Predictive parsing

EXPERIMENT 6 **3 Hours**

Implementation of Shift Reduce Parsing Algorithm

EXPERIMENT 7 **3 Hours**

Implementation of LR parsing.

EXPERIMENT 8 **3 Hours**

Implement the front end of a compiler that generates the three-address code for a simple language with: One data type integer, arithmetic operators, relational operators, variable declaration statement, one conditional construct, one iterative construct and assignment statement

EXPERIMENT 9 **3 Hours**

Implement the back end of the compiler which takes the three-address code as input and produces assembly language instructions that can be assembled and run using an 8086 assembler. The target assembly instructions can be simple move, add, sub, and jump.

EXPERIMENT 10 **3 Hours**

Implementation of the code optimizer phase of a compiler that eliminates dead code and common subexpressions

TOTAL: 30 HOURS

REFERENCES:

1.Alfred V Aho, Monica S. Lam, Ravi Sethi and Jeffrey D Ullman, ―Compilers – Principles, Techniques and Tools‖, 2nd Edition, Pearson Education,2007.

2. Doug Brown, John Levine, and Tony Mason, ―Lex&Yacc Second Edition, O'Reilly & Associates,1995

3.Steven S.Muchnick, Advanced Compiler Design and Implementation‖, Morgan Kaufmann Publishers – Elsevier Science, India, Indian Reprint 2003

4.V.Raghavan,PrinciplesofCompilerDesign‖,TataMcGrawHillEducationPublishers,2010

2302BS503 FUNDAMENTALS OF MANAGEMENT

L	T	P	C
3	0	0	3

PREREQUISITE:

A foundational course that covers basic business concepts.

COURSE OBJECTIVES:

**The course will cover the management theories, evolution of management over the years and few basic concepts without going into the details.
**To expose the students to know the functions of management, the organizational design, leadership and ethics in management.

COURSE OUTCOMES:

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

- **CO1:** Understand the evolution of management and contributions of key thinkers
- **CO2:** Learn the functions of management and the importance of leadership.
- **CO3:** Understand organizational culture, structure, and design..
- **CO4:** Learn how behavior impacts decision-making and teamwork.
- **CO5:** Understand business ethics, social responsibility, and corporate governance

COs Vs POs MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2	1	-	-	2	2	-	-	-	2	1	-	-
CO2	2	2	2	-	-	2	3	-	-	-	2-	1	-	-
CO3	2	3	1	-	-	1	2	-	-	-	2	3	-	-
CO4	3	2	-	-	-	2	2	-	-	-	1	2	-	-
CO5	2	1	-	-	-	2	2	-	-	-	2	2	-	-

COURSE CONTENTS:

MODULE I MANAGEMENT THEORIES **9 Hours**

Concept and Foundations of Management, Evolution of Management Thoughts [Pre-Scientific Management Era (before 1880), Classical management Era (1880-1930), Neo-classical Management Era (1930-1950), Modern Management era (1950-onward). Contribution of Management Thinkers: Taylor, Fayol, Elton Mayo etc

MODULE II FUNCTIONS OF MANAGEMENT & LEADERSHIP **9 Hours**

Planning, Organizing, Staffing, Directing, Controlling, Leadership - Concept, Nature, Importance, Attributes of a leader, developing leaders across the organization, Leadership Grid.

MODULE III ORGANIZATIONAL CULTURE AND DESIGN **9 Hours**

Organizational Culture, Managing Cultural Diversity - Organizational Design: Classical, Neoclassical and Contingency approaches to organizational design; Organizational theory and design, Organizational structure (Simple Structure, Functional Structure, Divisional Structure, Matrix Structure)

MODULE IV ORGANIZATION BEHAVIOR **9 Hours**

Introduction, Personality, Perception, Learning and Reinforcement, Motivation, Group Dynamics, Power & Influence, Work Stress and Stress Management, Decision Making, Problems in Decision Making, Decision Making, Organizational Culture, Managing Cultural Diversity.

MODULE V MANAGERIAL ETHICS AND SOCIAL RESPONSIBILITY 9 Hours

Ethics and Business, Ethics of Marketing & advertising, Ethics of Finance & Accounting, Decision – making frameworks, Business and Social Responsibility, International Standards, Corporate Governance, Corporate Citizenship, Corporate Social Responsibility.

TOTAL: 45 HOURS

REFERENCES:

1. Richard L. Daft, Understanding the Theory and Design of Organizations, Cengage Learning India Private Limited; 11th Edition,

2. Mahajan. J.P., ―Management Theory and Practices‖, 3rd Edition, Ane Books Pvt Ltd. 2011.

3. Stephen P. Robbins, Timothy A. Judge, NeharikaVohra, ―Organizational Behavior", Pearson, 2013.

4. Harold Koontz, Weihrich, ―Essentials of Management: An International, Innovation, and Leadership Perspective‖, 10th Edition, Tata McGraw Hill, 2015.

2303BS003 **MACHINE LEARNING** **L T P C**
3 0 0 3

PRE-REQUISITE:

NIL

COURSE OBJECTIVES:

1.Provide introduction to basic concepts of machine learning and classification techniques.

2.Introduce the concepts of statistical decision techniques

3.Explore the regression techniques and association mining rules

4.Understand the different clustering algorithms

5.Exposure mathematical models or techniques

COURSE OUTCOMES:

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

CO1: Describe different machine learning categories.
CO2: Understand statistical decision theory for various machine learning techniques.
CO3: Understand and use classification algorithms for various applications.
CO4: Use regression techniques for various applications.
CO5: Understand and use various algorithms for clustering.
CO6: Apply Hidden Markov Model for specific application.

COs Vs POs MAPPING:

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3	3	3	-	-	-	-	-	2	3	2	2	2
CO2	3	3	3	3	-	-	-	-	-	2	3	2	2	2
CO3	3	3	3	3	-	-	-	-	-	2	3	2	2	2
CO4	3	3	3	3	-	-	-	-	-	2	3	2	2	2
CO5	3	3	3	3	-	-	-	-	-	2	3	2	2	2

COURSE CONTENTS:

Module I **NTRODUCTION TO MACHINE LEARNING** **09 Hours**

Introduction to Machine Learning (ML), Relationship between ML and human learning; A quick survey of major models of how machines learn; Example applications of ML, Classification: Supervised Learning; The problem of classification; Feature engineering; Training and testing classifier models; Cross-validation; Model evaluation (precision, recall, F1-mesure, accuracy, area under curve), Expectation-Maximization (EM) algorithm for unsupervised learning.

Module II **STATISTICAL DECISION THEORY and CLASSIFICATION** **09 Hours**

Statistical decision theory including discriminant functions and decision surfaces; Naive Bayes classification; Bayesian networks; Decision Tree and Random Forests; k-Nearest neighbour classification; Support Vector Machines, Artificial neural networks including backpropagation; Applications of classifications; Ensembles of classifiers including bagging and boosting.

Module III REGRESSION **09 Hours**

Regression: Multi-variable regression; Model evaluation; Least squares regression; Regularization; LASSO; Applications of regression

Module IV CLUSTERING **09 Hours**

Clustering: average linkage; Ward's algorithm; Minimum spanning tree clustering; K-nearest neighbors clustering; BIRCH; CURE; DBSCAN Anomaly and outlier detection methods.

Module V HIDDEN MARKOV MODELS **09 Hours**

Hidden Markov Models (HMM) with forward-backward and Viterbi algorithms; Sequence classification using HMM; Conditional random fields; Applications of sequence classification such as part-of-speech tagging.

TOTAL: 45 HOURS

TEXT BOOKS:

1.C. Bishop, Pattern Recognition and Machine Learning, Springer, 2007.

REFERENCES:

1.E. Alpaydin, Introduction to Machine Learning, 3/e, Prentice-Hall, 2014.
2.A. Talwalkar, M. Mohri, Foundations of Machine Learning, MIT Press.
3.Webb, Statistical Pattern Recognition, 3/e, Wiley, 2011.

2303BS005	COMPUTATIONAL FINANCE AND MODELING	L	T	P	C
		1	0	2	2

PREREQUISITE:

Knowledge of at least one of C/C++/MATLAB/R/Spreadsheets Packages, Basic knowledge of Probability, Statistics and Linear Programming

COURSE OBJECTIVES:

- Understand existing financial models in a quantitative and mathematical way.
- Apply these quantitative tools to solve complex problems in the areas of portfolio management, risk management and financial engineering.
- Explain the approaches required to calculate the price of options.
- Identify the methods required to analyze information from financial data and trading systems.

COURSE OUTCOMES:

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

CO1: 1. Recall the existing financial models in a quantitative and mathematical way. (K1)
CO2: 2. Understand these quantitative tools to solve complex problems in the areas of portfolio management, risk management and financial engineering. (K2)
CO3: 3. Understand the approaches required to calculate the price of options. (K2)
CO4: 4. Apply the various statistical methods to analyze the financial data (K3)
CO5: 5. Apply acquired knowledge to new problems in a quantitative way (K3)

COs Vs POs MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PS03
CO1	3	2	1	–	2	2	2	–	–	–	2	3	2	-
CO2	3	3	2	–	3	2	3	–	–	–	3	3	3	2
CO3	3	3	2	–	2	1	2	–	–	–	3	3	2	2
CO4	3	2	–	–	3	2	2	–	–	–	3	3	3	2
CO5	3	2	–	–	3	2	2	–	–	–	3	3	3	3

COURSE CONTENTS:

MODULE I NUMERICAL MODELS AND METHODS **08 Hours**

Regression models – Time series Data - Numerical methods relevant to integration, differentiation and solving the partial differential equations of mathematical finance-finite difference methods -algorithms and question of stability and convergence, treatment of near and far boundary conditions, the connection with binomial models, interest rate models, Multifactor models

MODULE II BLACKSCHOLES FRAMEWORK **09 Hours**

Black-Scholes framework: Black-Scholes PDE: simple European calls and puts; put-call parity. The PDE for pricing commodity and currency options. Discontinuous payoffs - Binary and Digital options. The Greeks: theta, delta, gamma, vega& rho and their role in hedging. The mathematics of early exercise - American options: perpetual calls and puts; the pricing of American options, pricing interest rate dependent claims, and credit risk. Optimal exercise strategy and the smooth pasting condition. Volatility considerations - actual, historical, and implied volatility; local vol and volatility surfaces.

MODULE III APPLICATION AREAS **09 Hours**

Simulation including random variable generation, variance reduction methods and statistical analysis of simulation output. Pseudo random numbers, Linear congruential generator, Mersenne twister RNG. Monte Carlo integration, Simulation of Random walk and approximations to diffusion processes, martingale control variables, stratification, and the estimation of the "Greeks". Application areas include The use of importance sampling for Monte Carlo simulation of VaR for portfolios of options.

MODULE IV FINANCIAL PRODUCTS AND MARKETS **09 Hours**

Financial Products and Markets: Introduction to the financial markets and the products which are traded in them: Equities, indices, foreign exchange, and commodities. Options contracts and strategies for speculation and hedging.

MODULE V STATISTICAL ANALYSIS OF FINANCIAL RETURNS **10 Hours**

Statistical Analysis of Financial Returns: Fat-tailed and skewed distributions, outliers, stylized facts of volatility, implied volatility surface, and volatility estimation using high frequency data. Copulas, Hedging in incomplete markets, American Options, Exotic options, Electronic trading, Jump Diffusion Processes, High-dimensional covariance matrices, Extreme value theory, Statistical Arbitrage

TOTAL: 45 HOURS

ONLINE REFERENCES:

1. *https://www.coursera.org/learn/financial-engineering-computational methods*
2. *https://www.udemy.com/course/quantitative-finance-algorithmic-trading-in-python/*
3. *https://www.edx.org/course/mathematical-methods-for-quantitativefinance*
4. *https://www.iiqf.org/courses/certificate-program-applied-mathematic al-finance-engineers.html*

REFERENCES:

1. *R. Seydel: Tools for Computational Finance, 2nd edition, Springer-Verlag, New York, 2004.*
2. *P. Glasserman: Monte Carlo Methods in Financial Engineering, SpringerVerlag, New York,2004.*
3. *W. Press, S. Teukolsky, W. Vetterling and B. Flannery, Numerical Recipes in C: The Art of Scientific Computing, 1997. Cambridge University Press, Cambridge, UK. Available on-line at: http://www.nr.com/.*
4. *D. Ruppert, Statistics and Data Analysis for Financial Engineering*
5. *R. Carmona: Statistical Analysis of Financial Data in S-Plus*
6. *N. H. Chan, Time Series: Applications to Finance*
7. *R. S. Tsay, Analysis of Financial Time Series*
8. *J. Franke, W. K. Härdle and C. M. Hafner, Statistics of Financial Markets: An Introduction*

2301BS551	BUSINESS COMMUNICATION &VALUE SCIENCE– III	L	T	P	C
		0	0	4	2

PREREQUISITE:

BUSINESS COMMUNICATION &VALUE SCIENCE– II

COURSE OBJECTIVES:

1. **Develop analytical skills** by applying SWOT, TOWS, and other frameworks to assess personal and external challenges in real-life scenarios.
2. **Enhance cultural awareness and pluralism understanding** by exploring diverse cultural identities, gender roles, and the dynamics of global, local, and trans-locational cultures.
3. **Understand the critical role of science and technology** in nation-building, including the history of scientific inventions and effective technical communicationskills.
4. **Gain foundational knowledge of Artificial Intelligence (AI)** and its future implications in professional and everyday contexts, along with practical applications of AI and IoT.
5. **Promote social responsibility and community engagement** through hands-on project campaigns addressing societal issues and proposing practical technological solutions

COURSE OUTCOMES:

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

CO1: **Explain the concepts and processes involved in SWOT and TOWS analyses** and how they apply to personal and external life situations.

CO2: **Describe the characteristics of pluralism in cultural spaces**, including the significance of gender roles and multicultural interactions.

CO3: **Summarize the role of science and technology in nation-building** and outline the importance of technical writing in scientific communication.

CO4: **Interpret key ideas related to Artificial Intelligence (AI)** and its potential impact on daily life and professional environments.

CO5: **Discuss the importance of social consciousness and community engagement** and explain how technology can address societal issues.

COs Vs POs MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	-	-	-	3	-	-
CO2	-	-	-	-	-	-	-	-	3	-	-
CO3	-	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	-	3	-	-

CO5	-	-	-	-	-	-	-	-	3	-	-
									3		

COs Vs PSOs MAPPING

COs	PSO1	PSO2	PS03
CO1	-	-	-
CO2	-	-	-
CO3	-	-	-
CO4	-	-	-
CO5	-	-	-

COURSE CONTENTS:

MODULE I FRAMEWORK OF ANALYSIS **3 Hours**

Concepts: Person analysis: SWOT analysis - SWOT and Life Positions –Analysis of others' lives – Analysis of one's own life. - TOWS Analysis: How to turn threat into opportunity – VUCA - Volatility, uncertainty, complexity and ambiguity - Application of analysis in real life scenarios – Maslow's theory of motivation

MODULE II PLURALISM IN CULTURAL SPACES **3 Hours**

Concepts: Identifying Pluralism in cultural spaces - uniqueness and differences - Global, local and Trans locational cultures–benefits, differences and implications of multi-culture–Gender awareness-Roles and relations of different genders.

MODULE III ROLE OF SCIENCE IN NATION BUILDING **3 Hours**

Concepts: Role of science in nation building –Pre & Post Independent scientific inventions and inventors – development of Information Technology– Technical writing – Introduction and application of Technical writing.

MODULE IV ARTIFICIAL INTELLIGENCE **3 Hours**

Concepts: Artificial Intelligence–Recognizing the importance of AI– Future of AI–Communicating with machines– Technical writing in profession.

MODULE V PROJECT CAMPAIGN **3 Hours**

Concepts: Social consciousness–contributing to society.

TOTAL: 15 HOURS

List of Laboratory Activity Based on Modules:

Activity I : SWOT analysis of a well-known individual's life - Creating one's own SWOT– TED talk on bio-mimicry – Group activity - Presentation on strengths identified to survive in the VUCA World – Watching videos of motivation &discussion. 6 Hours

Activity II : Group activity – Exploring cultures and traditions of different states – Performing Indian dance forms - Debate on Global, local and Translocation impacts – cultural misunderstanding – Group discussion on implications of cross cultural communication –Gender awareness campaign: College, Workplace, Family, Friend 6 Hours

Activity III: Discussion on the role of scientists and mathematicians –Presentation on eminent scientists and mathematicians –Quiz on Scientists and inventions – Writing a technical article -Explaining something to visually impaired person. 6 Hours

Activity IV : Skit on Voice Assistant in future – Discussion on AI in everyday life – Deliberation on future colleges and workplaces -Watching Dr Bimal Ray's videos on cryptology–Explaining IOT. 6 Hours

Activity V: Project visit to rural area/ underprivileged parts of city to address some of the local issues; if relevant, suggest a practical technology solution to the issues. 6 Hours

Activity I : SWOT analysis of a well-known individual's life - Creating one's own SWOT– TED talk on bio-mimicry – Group activity - Presentation on strengths identified to survive 6 Hours

in the VUCA World – Watching videos of motivation &discussion.

Total Hours 45

ONLINE REFERENCES:

1. ***TED Talk on Biomimicry*** *(Janine Benyus)* https://www.ted.com/talks/janine_benyus_biomimicry_in_action
2. ***Gender Roles and Relations*** *(UN Women - Gender Equality Glossary)* https://www.unwomen.org/en/news/in-focus/women-and-the-sdgs/sdg-5-gender-equality
3. ***Understanding Globalization and Culture*** *(Globalization 101)* https://globalization101.org/culture/
4. ***Communicating with Machines and Voice Assistants*** *(Google AI Blog) https://ai.googleblog.com/2020/05/how-google-assistant-understands-you.html*

REFERENCES:

1. *Hubbard,RonL.Self-Analysis.BridgePublicationsInc;Rev.Ed,July1,2007.*
2. *GaryN.Powell.ManagingaDiverseWorkforce:LearningActivities.SagePublication,June19,2012.*
3. *M.S.Gore. Unityin Diversity:The Indian Experience in Nation-Building, Rawat Publications. Rawat Pub.Jaipur, Rajasthan, Dec 31, 2015.*
4. *Russell, Stuart. Artificial Intelligence: A ModernApproach,4thEd.,UniversityofCaliforniaatBerkeley, Pearson,2020.*
5. *Raman, Meenakshi and Sharma, Sangeeta. Fundamental sofTechnical Communication. Paperback, October 30,2014*