THIRD SEMESTER

Sl. No.	Course Category	Subject Code	Subject Title	L	T	P	Contact Hours/week	Credit	Full Marks
1.	Humanities Science – 3	HS 301	Effective Technical Communication	3	0	0	3	3	100
2.	Engineering Science – 9	ES 302	Python Programming	3	0	0	3	3	100
3.	Basic Science – 7	BS 303	Biology for Engineers	2	0	0	2	2	100
4.	Basic Science – 8	BS 304	Probability and Statistics	3	1	0	4	4	100
5.	Program Core - 1	PC CS 310	Artificial Intelligence	3	0	0	3	3	100
6.	Program Core - 2	PC CS 306	Data Structures & Algorithm	3	0	0	3	3	100
7.	Engineering Science – 10	ES 307	Python Programming Lab	0	0	2	2	1	100
8.	Program Core - 3	PC CS 308	Data Structure Lab	0	0	2	2	1	100
9.	Program Core - 4	PC CS 311	Software Tools and Techniques Lab	0	0	2	2	1	100
10.	Mandatory Course - 3	MC 310	Indian Constitution	2	0	0	2	0	100
Total :				**19**	**1**	**6**	**26**	**21**	**1000**

Effective Technical Communication

Course Code	HS 301
Course Title	Effective Technical Communication
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	1st year B.Tech
Course Category	Humanities Science (HS)
Number of classes	36 hours

Course Outcomes:

At the end of the course, the student will be able to -

CO Number	CO Description	K-level
CO-1	Illustrate the nature and objective of Technical Communication relevant for the work place as Engineers	K2
CO-2	Utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.	K3
CO-3	Develop effective verbal and non-verbal communication skills.	K3
CO-4	Analyze ethical, legal, cultural, and global issues affecting Technical Communication and Develop appropriate life skills.	K4

Module 1: (09 Hours)

Essentials of Communication: What is Communication, Process of Communication, Levels of communication, The flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group) Communication Barriers to communication, Non-verbal Communication,, Technology Enabled communication, Impact of Technology, Selection of appropriate communication Technology, Importance of Technical Communication, Differences between general and technical communication.

Module 2: (09 Hours)

Technical Writing Skills: Technical writing process – Choosing right words, phrases and sentence patterns, clarity of purpose, planning content, effective style of writing, formatting, proofreading.

Technical Reports & Proposals: Definition & importance; Thesis/Project writing: structure & importance; synopsis writing: Methods; Technical research Paper writing: Methods & style; Seminar & Conference paper writing; Writing of Reports & Proposals.

Business letters: Sales & Credit letters; Claim and Adjustment Letters; Letters of Enquiry, Order Placement letters.

Email Writing: Reasons for popularity; guiding principles for composition; some common

pitfalls; maintaining common etiquette.

Module 3: **(09Hours)**

Workplace Communication: Applying for a job: Skimming advertisements; Writing job applications; Preparing CV, Resume. Group Discussions: Group Discussion types; GD as a part of selection process; Key skills to succeed in group discussions; Dos and Don'ts of group discussions; Use of body language in GDs. Job Interviews: Objectives; Types; Stages of Interview, Face to face Interviews; Telephonic Interviews.

Effective Business Presentations: Importance in workplace communication; Planning, Preparing, Organizing, Rehearsing, and Delivering Oral presentations, Handling Questions; Visual aids in presentations; Power Point Presentations

Ethics in Communication: Communication challenges in culturally diverse workforce; Bias-free communication

Module 4: **(09 Hours)**

Developing soft skills / Life Skills: Introduction to soft skills: Soft skills as a competitive weapon in today's changing workplace. Classification of soft skills: Time management, Attitude, Responsibility, Ethics & Values, self- confidence, Teamwork and Interpersonal skills, Problem solving skills.

Personality Development: Developing Right personality to enhance Life Skills, Personality types; Personality attributes; and Leadership Qualities.

Body Language : Emotions displayed by body language: Aggressive, Submissive, Attentive, Nervous, Upset, Bored, Relaxed, Defensive; Hand Shake; Eye Contact; Posture and Positioning. Personality traits and soft skills in early stages of career advancement and for future career advancement.

Recommended Books:

1) Sanjay Kumar & PushpLata Communications Skills , 2nd Edition, Oxford University Press
2) Meenakshi Raman & Sangeeta Sharma Technical Communication: Principles & Practice Oxford University Press
3) Barun Kumar Mitra, Personality Development and Soft Skills Oxford University Press.
4) Personality Development, Harold R. Wallace &L. Ann Masters, Cengage Learning, NewDelhi.
5) Effective Communication Skill, Kulbhusan Kumar, RS Salaria, Khanna Publishing House.
6) Communication Skills for Engineers and Scientists, Sangeeta Sharma et.al. PHI Learning Pvt. Ltd, 2011, New Delhi.
7) Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, McGraw Hill & Co. Ltd., 2001, New Delhi.
8) A Text Book of Scientific and Technical Writing by S.D. Sharma; Vikas Publication, Delhi.
9) Skills for Effective Business Communication by Michael Murphy, Harward University, U.S

List of Software/Learning Websites

1.http://www.free-english-study.com/

2. http://www.english-online.org.uk/course.htm

3. http://www.english-online.org.uk/
4. http://www.talkenglish.com/
5. http://www.learnenglish.de/

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PYTHON PROGRAMMING

Course Code	ES 302
Course Title	Python Programming
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	ES 204
Course Category	Engineering Science
Number of classes	36 hours

Course Outcome:

After completion of this course the students will be able to:

CO Number	CO Description	K-Level
CO-1	Understanding data types (like character strings, integers, and real numbers) and the operations of each data type.	K2
CO-2	Understanding programs that get input, perform calculations, and provide output (using Conditional logic, loops, Functions).	K2
CO-3	Describe the use of sequence containers and their functions.	K2
CO-4	Apply the concepts of function and Class in Python	K3
CO-5	Apply file operations along with python built-in functions and Modules.	K3

Course Content:

Module 1: (9 Hours)

Basics of Python: Entering and Storing Data- Binding Values to Names- More Python Syntax Basics- Reading and Converting User Input. Making Decisions- Conditions in Python- Making Decisions: Simple if Statements. -Multiple Choice Decisions. Iteration: For and While Loops- Terminating the Current Iteration.

Module 2: (9 Hours)

Lists, Sets and Dictionaries : Sequence Containers: Lists and Tuples- Writing Lists and Tuples- Accessing Sequence Values- Manipulating Lists and Tuples. Sets and Dictionaries - Creating Sets- Working with Sets- Working with Dictionaries -Applying Dictionaries: Counting Words.

Module 3: (9 Hours)

Function and Class: Function: With arguments and without Arguments, Function Calling, String Formatting- The format () Method- Function Arguments- Format Field Names- More about Looping-- Fun with the range () function- While Loops and User Input Validation, Object and Class.

Module 4: (9 Hours)

Files: Reading and Writing Files- Creating a New File- Writing to a File- Reading Files as Text, Python's Built- In Functions- abs(x)- bool(x)- chr(i), The Python Standard Library-Namespaces- Python Modules, Regular Expressions.

Text/Reference Books:

1. Introduction to Programming Using Python, First Edition by Y. Daniel Liang, ©2013 Prentice Hall.

2. Dawson, Michael. Python Programming for the Absolute Beginner (3rd ed.). Boston, MA: Course Technology, 2010.

3. Shaw, Zed A., 2012. Learn Python the Hard Way, Second Edition, Shavian Publishing, LLC, 183 p

www.nptel.ac.in

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Biology for Engineers

Course Code	BS 303
Course Title	Biology for Engineers
Number of Credits	2 (L: 2, T: 0, P: 0)
Prerequisites	-
Course Category	Basic Science (BS)
Number of classes	26 hours

Course Outcome:

After completion of the course, students will be able to:

CO Number	CO Description	K-level
CO-1	Demonstrate the understanding of biology and its branches, major classifications of life, Cells, Cellular systems their functions and biological molecules.	K2
CO-2	Illustrate the molecular basis of genetic information and the flow of genetic information from DNA to RNA to protein and the concept of mutations, re-combinations and its applications.	K2

CO-3	Explain the fundamental principles of energy transactions in physical and biological and physiological systems, basic metabolisms.	K2
CO-4	Classify microorganisms, growth, nutrition with their various methods used for the isolation, identification, control and maintenance of microbial cultures.	K4

Course Content:

Module 1: (8 Hours)

Introduction to Biology, Classification and Biomolecules: Detailed content of the module: Introduction to Biology and its branches. Molecular taxonomy- three major kingdoms of life. Prokaroytic and Eukaryotic cells. Energy and Carbon utilization. Cells: Animal and Plant cell structures and functions. Cell cycle and Cell division. Transport across cell membrane. Cell signaling.

Molecules of life. Monomericunits and polymeric structures. Sugars, starch and cellulose .Lipids, Amino acids and proteins. Nucleotides, DNA and RNA. Proteins-structure and function. Proteins as enzymes, transporters, receptors and structural elements. Enzyme classification. Mechanism of enzyme action. Enzyme kinetics.

Module 2: (6 Hours)

Fundamentals of genetics and flow of information: Detailed content of the module: General principles of genetics, Concept of segregation and independent assortment. Molecular basis of information transfer, molecular basis of coding and decoding genetic information. DNA as genetic material. Concept of genetic code. Define gene in terms of complementation and recombination. Mutation. Recombinant DNA technology. Gene mapping. Application of recombinant DNA technology, recombinant products available in the market and at laboratory scale.

Module 3: (6 Hours)

Microbiology and applications: Detailed content of the module: Microorganisms and environment: Identification and classification of microorganisms. Ecological aspects of single celled organisms. Microbial integrations. Growth, nutrition and reproduction. Growth kinetics. Isolation and identification of microorganisms. Pure cultures and their characteristics. Maintenance of cultures. Sterilization. Physical and chemical methods of control of microorganisms. Management of toxic industrial wastes.

Module 4: (6 Hours)

Fundamentals of energy transaction and metabolism: Detailed content of the module: Thermodynamics –laws and its application in biological systems. Energy yielding and energy consuming biochemical processes.

Metabolism- Glycolysis & Krebs cycle, Role of ATP and concept of energy change. Equilibrium constant. Physiological steady-state, Living body as a thermodynamic system.

Fundamental aspects of analysis of living systems; quantitative aspects of physiology and engineering applications to clinical medicine based on body fluid balance, solute transport, basic

endocrinology, reproduction physiology, neurophysiology, skeletal and smooth muscle physiology.

References / Suggested Learning Resources:

1. Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd. 12thEdition, 2020
2. Guyton and Hall, Medical Physiology, 14th Edition, Elsevier Saunders,2020
3. Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company.
4. Principles of Genetics, D. Peter Snustad and Michael J. Simmons. 7thEdition, Wiley Publisher,2015
5. Prescott's Microbiology, Joanne Willey and Kathleen Sandman and Dorothy Wood, 2020. 11th Edition McGrawHill

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Probability and Statistics

Course Code	BS 304
Course Title	Probability and Statistics
Number of Credits	4 (L: 3, T: 1, P: 0)
Prerequisites	BS 202
Course Category	Basic Science (BS)
Number of classes	48 hours

Course Outcome:

After completion of the course, students will be able to:

CO Number	CO Description	K-level
CO-1	Establish mean and variance of a given probability distribution	K3
CO-2	Compute Moments –central moments – conditional expected values – probability generating functions – Moment generating functions	K3
CO-3	Solve numerically algebraic/transcendental equation and ordinary differential equations.	K3
CO-4	Apply the method of least square; t-test, chi-square test; x-bar, p, R charts	K3

Course Content:

Module 1: **(12 Hours)**

Probability: Sample space, Events, Random Variables; Definitions of probability, conditional Probability, independence, expectation and higher order moments, distributions (probability mass function, probability density function) examples of discrete and continuous distributions: Normal, Poisson, Binomial distributions, Application of Bay‟s Theorem

Module 2: **(12 Hours)**

Random Variables, Distributions and density functions: Expected value of a random variable - expected values of functions of random variable – Moments –central moments – conditional expected values – probability generating functions –Moment generating functions; The Cumulative distribution function - Probability density function –Uniform random variable – exponential –Laplace – gamma –Chi – squared.

Module 3: **(12 Hours)**

Numerical Methods: Numerical solution of algebraic and transcendental equations by Regula-Falsi method Newton-Raphson's method; Finite Differences - Newton's Forward, backward difference interpolation formulae – Lagrange interpolation; Numerical Integration with Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule; Solving first order differential equations –Taylor's series method, Euler's method, modified Euler's method, RungeKutta method of 4th order.

Module 4 **(12 Hours)**

Statistics: Measures of Central tendency and Measures of Variations (Dispersions), standard deviation, Moments, Measures of skewness and kurtosis, Quartiles and Percentiles, covariance, correlation, Hypothesis testing covering, Types of Error, Power of a test, Goodness of a fit, Student‟s t and Chisquare; Sufficient Statistic and MLEs; Limit theorems and convergence of random variables, Linear regression, Curve fitting – linear and nonlinear regression analysis. Statistical Quality Control Methods: Methods for preparing control charts – Problems using x-bar, p, R charts and attribute charts.

References / Suggested Learning Resources:

1. Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd. 12thEdition, 2020
2. Guyton and Hall, Medical Physiology, 14th Edition, Elsevier Saunders,2020
3. Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company.
    i. Principles of Genetics, D. Peter Snustad and Michael J. Simmons. 7thEdition, Wiley Publisher,2015
4. Prescott's Microbiology, Joanne Willey and Kathleen Sandman and Dorothy Wood, 2020. 11th Edition McGrawHill

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Artificial Intelligence

Course Code	PC CS 310
Course Title	Artificial Intelligence
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	Data Structure & Algorithm, Mathematics, Basic Programming
Course Category	Program Core
Number of classes	36 hours

Course Outcome:

After completion of the course, students will be able to:

CO Number	CO Description	K-level
CO-1	Explain the biological foundations to intelligent systems and searching.	K2
CO-2	Explain the fundamentals of experts systems.	K2
CO-3	Apply knowledge representation and implement logic programming.	K3
CO-4	Apply reasoning under uncertainty.	K3

Course Content:

Module 1: (9 Hours)

Concept of AI, history, current status, Defining the Problem as a State Space Search, Search: BFS, DFS; Heuristic Search Techniques: Hill Climbing, Best-First Search, A* Algorithm, Problem Reduction, AO*Algorithm, stochastic annealing, Minimax Search, Alpha-Beta Pruning.

Biological foundations to intelligent systems: Overview of different forms of learning, Learning Decision Trees, Artificial neural networks, Back-propagation networks, Radial basis function networks, and recurrent networks. Fuzzy logic, Genetic algorithm, and fuzzy neural networks.

Module 2: (9 Hours)

Knowledge representation and logical inference Issues in knowledge representation, Knowledge-based systems structures, and its components. Propositional Logic, First Order Predicate Logic: Representing Instance and is-a Relationships, Computable Functions and Predicates, Syntax and Semantics of FOPL, Normal Forms, Unification and Resolution, Representation Using Rules, Natural Deduction; Structured Representations of Knowledge: Semantic Nets, Frames, Conceptual Dependency, Scripts.

Module 3: **(9 Hours)**

Overview of an Expert System, Structure of an Expert Systems, Different Types of Expert Systems- Rule Based, Model Based, Case Based and Hybrid Expert Systems, Knowledge Acquisition and Validation Techniques, Black Board Architecture, Knowledge Building System Tools, Expert System Shells, Fuzzy Expert systems.

Module 4: **(9 Hours)**

Uncertain Knowledge and Reasoning, Probabilities, Reasoning under uncertainty: Probabilistic reasoning, belief networks, hidden Markov model.

Truth Maintenance Systems, Logics for Non-Monotonic Reasoning, Statistical Reasoning: Bayes Theorem, Certainty Factors and Rule-Based Systems, Bayesian Probabilistic Inference, Bayesian Networks, Dempster-Shafer Theory, Fuzzy Logic: Crisp Sets, Fuzzy Sets, Fuzzy Logic Control, Fuzzy Inferences and Fuzzy Systems.

References / Suggested Learning Resources:

1. Artificial Intelligence, George F Luger, Pearson Education Publications
2. Artificial Intelligence, Elaine Rich and Knight, Mcgraw-Hill Publications
3. Introduction to Artificial Intelligence & Expert Systems, Patterson, PHI
4. Multi Agent systems- a modern approach to Distributed Artificial intelligence, Weiss. G, MIT Press.
5. Artificial Intelligence : A modern Approach, Russell and Norvig, PrinticeHall

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Data Structure and Algorithm

Course Code	PC CS 306
Course Title	Data Structure and Algorithm
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	ES204 (Programming for Problem Solving)
Course Category	Program Core(PC)
Number of classes	36 hours

Course Outcome:

After completion of the course, students will be able to:

CO Number	CO Description	K-level
CO-1	Understanding the basic concepts of data structures and algorithms	K2
CO-2	Apply concepts about searching and sorting techniques	K3
CO-3	Apply basic concepts about stacks, queues, lists, trees and graphs	K3
CO-4	Develop algorithms for solving problems with the help of fundamental data structures	K3

Course Content:

Module1: **(6 Hours)**

Introduction: Basic Terminologies: Elementary Data Organizations, Data Structure Operations: insertion, deletion, traversal etc.; Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off Searching: Linear Search and Binary Search Techniques and their complexity analysis

Module 2: **(6 Hours)**

Stacks and Queues: ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation corresponding algorithms and complexity analysis. ADT queue, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each types of Queues: Algorithms and their analysis.

Module 3: **(12 Hours)**

Linked List and Trees: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue,

Header nodes, doubly linked list: operations on it and algorithmic analysis; Circular Linked Lists: all operations their algorithms and the complexity analysis

Trees: Basic Tree Terminologies, Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, AVL Tree; Tree operations on each of the trees and their algorithms with complexity analysis. Applications of Binary Trees. B Tree, B+ Tree: definitions, algorithms and analysis

Module 4: **(12 Hours)**

Sorting Hashing and Graph :Sorting and Hashing: Objective and properties of different sorting algorithms: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort; Performance and Comparison among all the methods, Hashing.

Graph: Basic Terminologies and Representations, Graph search and traversal algorithms and complexity analysis.

Suggested books:

1. "Fundamentals of Data Structures", Illustrated Edition by Ellis Horowitz, Sartaj Sahni, and Computer Science Press.
2. “Data Structures using C/C++ “Tannenbaum”

Suggested reference books:

1. Algorithms, Data Structures, and Problem Solving with C++",Illustrated Edition by Mark Allen Weiss, Addison-Wesley Publishing Company
2. "How to Solve it by Computer", 2nd Impression by R. G. Dromey, Pearson Education.

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Python Programming Lab

Course Code	ES 307
Course Title	Python Programming Lab
Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	Nil
Course Category	Engineering Science (ES)
Number of classes	24 hours

Course Outcome:

CO Number	CO Description	K-Level
CO-1	To discuss the art and science of computer programming.	K2
CO-2	Explain program related to List and dictionary.	K3
CO-3	To analyze and debug programs (find out what is wrong and fix it).	K4
CO-4	Formulate program to explain programming basics.	K5

Course Content:

List of Experiments/ Practices (Minimum 6 experiments to be performed)

1. First program in python.
2. Programs related to basic input/ output.
3. Programs related to variables, strings, and numbers.
4. Programs related to Lists and Tuples.
5. Programs related to Functions
6. Programs related to If Statements
7. Programs related to While Loops and Input
8. Programs related to Basic Terminal Apps
9. Programs related to Dictionaries.
10. Programs related to Classes.
11. Programs related to Exceptions.
12. Programs related to GUI programming.
13. Using Word, Excel, PDF files in python.
14. Web programming in python, Case study of application areas of python.

References / Suggested Learning Resources:

1) Introduction to Programming Using Python, First Edition by Y. Daniel Liang,©2013
2) Prentice Hall.
3) Dawson, Michael. Python Programming for the Absolute Beginner (3rd ed.). Boston, MA: Course Technology, 2010.
4) Shaw, Zed A., 2012. Learn Python the Hard Way, Second Edition, Shavian Publishing, LLC, 183 p

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Data Structure Lab

Course Code	PC CS 308
Course Title	Data Structure Lab
Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	ES208
Course Category	Program Core (PC)
Number of classes	24 hours

Course Outcome:

After completion of the course, students will be able to:

CO Number	CO Description	K-level
CO-1	Analyze the algorithms to determine the time and computation complexity.	K3
CO-2	Solve Search problem (Linear Search and Binary Search)	K3
CO-3	Solve problem of Stacks, Queues and linked list and analyze the same to determine the time and computation complexity	K4
CO-4	Construct an algorithm using Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity	K4
CO-5	Apply Graph search and traversal algorithms and determine the time and computation complexity	K4

List of Experiments (*Minimum 6 experiments are to be performed. Use of virtual laboratory to perform few experiments may be explored, if available****):***

1. Implementation of array operations
2. StacksandQueues:adding,deletingelementsCircularQueue:Adding&deletingelements
3. Problems to solve using stacks and queues as per the theory subject Data Structure and Algorithm
4. Implement different operations (insertion, deletion, searching, sorting, and traversals) on Single linked list, double linked list, circular linked list.
5. ImplementdifferentsortingalgorithmsaslistedinDataStructureandAlgorithmsubject
6. Implement Graph.
7. Perform Graph search operations

References / Suggested Learning Resources:

1. "Data Structures and Program Design In C", 2/E by Robert L. Kruse, Bruce P. Leung
2. "Data Structure & Algorithms Using C", 5th Ed., Khanna Publishing House
3. "Fundamentals of Data Structures of C" by Ellis Horowitz, Sartaj Sahni, Susan Andersonfreed.
4. "Data Structures in C" by Aaron M.Tenenbaum.
5. "Data Structures" by S.Lipschutz.
6. "Data Structures Using C" by Reema Thareja.
7. "Data Structure Using C", 2/e by A.K. Rath, A. K.Jagadev.
8. "Introduction to Algorithms" by Thomas H. Cormen, Charles E. Leiserson, RonaldL. Rivest, Clifford Stein
9. "Data Structures through C" by Yashwant Kanetkar, BPB Publications.

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Software Tools and Techniques Lab

Course Code	PC CS 311
Course Title	Software Tools and Techniques Lab
Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	Nill
Course Category	Program Core (PC)
Number of classes	24

Course Outcome:

After completion of the course, students will be able to:

CO Number	CO Description	K-level
CO-1	Apply the knowledge of software version control to manage big software	K3
CO-2	Develop simple web-based applications to handle GUI related software applications	K3
CO-3	Prepare professional looking documents using document management software	K4
CO-4	Develop skills to handle power tools for building applications.	K4

List of Practical:

A lab each on (a) Linux based Shell programming to carry out bigger tasks including command line inputs, (b) Python based program to do tasks such as finding out if the network external interfaces are working or not (c) Javascript based Web-browser application of dynamic pages.

Web programming using Python to be able to create forms and submit inputs to the server where they are processed and results are produced

GUI programming tools using Python and an exercise to be able to create a GUI (in other than an HTML form) and take inputs and process them on the local machine/server.

LaTeX based document structuring and encouraging the students to write their own CV in LaTeX, compile and view in PDF.

Software management tools such as version control (SVN), Bug reporting (Bugzila) etc.

A project worth three labs to build at least 5000 line worth project using the tools covered in this course.

Text Books/ References:

1 E. Nemeth, G. Snyder and T. R. Hein, Linux Administration Handbook, Prentice Hall PTR, 2002.

2 L. Wall, T. Christainsen and J. Orwant, Programming PERL, 3rd Ed, O Reilly, 1999.

3 D. Curry, UNIX Systems Programming for SVR4, O Reilly, 1996.

4 S. Kochan and P. Wood, Unix Shell programming, 3rd Ed, SAMS, 2003.

5 S. Das, Unix System V.4 Concepts and Applications, 3rd Ed, Tata Mcgraw-Hill, 2003.

6 Rubini and J. Corbet, Linux Device Drivers, 2nd Ed, OReilly, 2001.

7 D. Flanagan, Javascript: The Definitive Guide, Fifth Edition, O'REILLY, 2006.

8 D. Gosselin, PHP Programming with MySQL, Course Technology, 2006.

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Indian Constitution

Course Code	MC 310
Course Title	Indian Constitution
Number of Credits	0 (L: 2, T: 0, P: 0)
Prerequisites	Nil
Course Category	Mandatory Course (MC)
Number of classes	25 hours

Course Outcome:-

After completion of the course, students will be able to:

CO Number	CO Description	K-level
CO-1	Explain about framing and nature of Indian Constitution.	K2
CO-2	Outline the Federal Structure, Centre- State relation, Union Executive and Amendment Procedure	K2
CO-3	Demonstrate the meaning of local self govt., types of local self govt. in rural and urban areas.	K2
CO-4	Identify the fundamental rights and duties of individual and demonstrate the knowledge on Directive Principles of State Policy.	K3

Course Content:

Module 1: **(05 Hours)**

Constitutional Framework:

1. Meaning of Constitutional Law and Constitutionalism.
2. Historical perspective of the Constitution of India.
3. Salient features of the Constitution of India.

Module 2: **(06 Hours)**

Fundamental Rights, Duties and Directive Principles of State Policy:

1. Fundamental Rights- Articles 14, 19 and21.
2. Fundamental Duties.
3. Directive Principles of State Policy; Its Legal Status and Significance

Module 3: **(07 Hours)**

Nature of India's Political system:

1. Federal structure, Distribution of Legislative and Financial Powers between the Union and States.
2. Parliamentary Form of Government- Powers and Position of President of India.
3. Emergency Provisions.
4. Amendment Procedures of the Constitution of India.

Module 4: **(07 Hours)**

Rural and Urban Local Self Govt.:

1. 73rd Amendment of the Constitution and Panchayati Raj Institutions.
2. 74th Amendment of the Constitution and Urban Local Self Govt. (Municipal Corporation, Municipal Council and Nagar Panchayat).
3. TTAADC

References / Suggested Learning Resources:

1. Fadia, B.L- "Indian Govt. and Politics" Sahitya Bhawan, Agra.
2. D.D. Basu- "An introduction to the Constitution of India" Lexis Nexis publichers.
3. M.V. Pylee- "Constitutional Govt. in India" S. Chand and Company Ltd.
4. S.C. Kashyap (ed)- "Perspectives on the constitution" Shipra Publication.
5. B.K. Sharma- "Introduction to the Constitution of India" Prentice Hall India Private Ltd.
6. Bhattacharya, D.C. and Banerjee, Malay- "Indian Govt. and Politics" Vijaya Publishing House
7. J.C. Johari- "Indian Govt. and Politics" (2vols)
8. Das Nityan and a- "Grassroot Democracy and Panchayati Raj in Tripura" Progressive Publishers

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