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DEPARTMENT OF MANAGEMENT STUDIES

Books Publication Details

Sl. No.	Academic Year	Name of the Faculty	Title of the Book	National / International	Month/Year of publication	ISBN/ISSN number of the proceeding	Name of the publisher
1	2015-2016	Dr.S.Sathyasundari	Principle of Management	National	2015	ISBN-978-93-5163-586-4	Thakur Publishers
2	2017-2018	Dr.S.Sathyasundari	Organizational Behaviour	National	2017	ISBN-978-93-5273-551-8	Himalaya Publishing House
3	2021-2022	Dr.S.Sathyasundari	Legal Aspects of Business	National	2022	ISBN-978 -93 -5480-106 -8	Thakur Publishers


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DEPARTMENT OF MECHANICAL ENGINEERING ENGINEERING

Books Publication Details

Sl. No.	Academic Year	Name of the Faculty	Title of the Book	National / International	Month/Year of publication	ISBN/ISSN number of the proceeding	Name of the publisher
1	2017 - 2018	Dr.P.Thangavel	Strength of Materials	National	2017	978-93-332-0985-4	Technical publications, Pune
2	2019-2020	Mr. V.D.Prabhu	Process Planning and Cost Estimation	National	2019	978-93-87255-52-4	AR Publications, Chennai
3	2014-2015	Mr. V.D.Prabhu	Design of Jigs, Fixtures and Press Tools	National	2014	978-93-84634-64-3	AR Publications, Chennai

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Books Publications

Sl. No.	Name of the teacher	Title of the book/chapters published	Year of publication	ISBN/ISSN number of the proceeding	Name of the publisher
1	Dr.T.Senthilprakash	Information Retrieval Technique	2021	978-93-90614-31-8	Charulatha Publications
2	Dr.T.Senthilprakash	Professional Ethics in Enigneering	2021	978-93-90614-30-1	The Charulatha Publications
3	Dr.T.Senthilprakash, R.Premalatha	Problem Solving and Python Programming	2021	978-93-93476-00-6	The Charulatha Publications
4	Dr.T.Senthilprakash	Programming in C	2022	978-93-93479-71-6	The Charulatha Publications
5	Dr.T.Senthilprakash	Object Oriendted Programming	2022	978-93-95211-21-5	The Charulatha Publications

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Patent Publications

Sl. No.	Name of the teacher	Title of the Invention	Year of publication	Patent Application Number	Patent Office
1	Dr.R.Senthilkumar Dr.S.Prakasam K.Prathipa N.Kirthiga S.Sabarinathan	Method of Synthesising hybrid metal sand composite and 3D printing thereof optimising using DL	2021	2021105514	Innovation Patent, Australian Government



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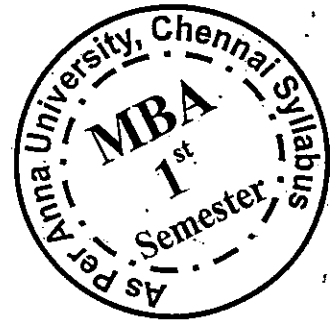
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S.no	Academic Year	Faculty Name	Patent title	Category	Reference Number	Date	Status
1	2022-2023	Dr.P.Thangavel	Design and analysis of Polydimethylsiloxane based micro structured channel arrays for damping passive vibration	Invention	202241055805 A	14.10.2022	Published
2	2022-2023	Dr.P.Thangavel	An Artificial Intelligence & Machine Learning Based Internet of Things Enabled Virtual Shop Interface having Robotic Means	Invention	1193880	06.06.2022	Registered
3	2016-2017	Dr.P.Thangavel	A Self-Powered Communication Tower with Multiple Transmission System	Invention	201641041443 A	30.12.2016	Published
4	2021-2022	Dr.S.Prakasam	Method of synthesizing hybrid metal sand composite and 3DPrinting thereof optimizing using DL	Innovation	2021105514	14.08.2021	Published

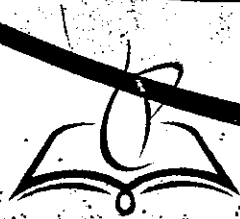
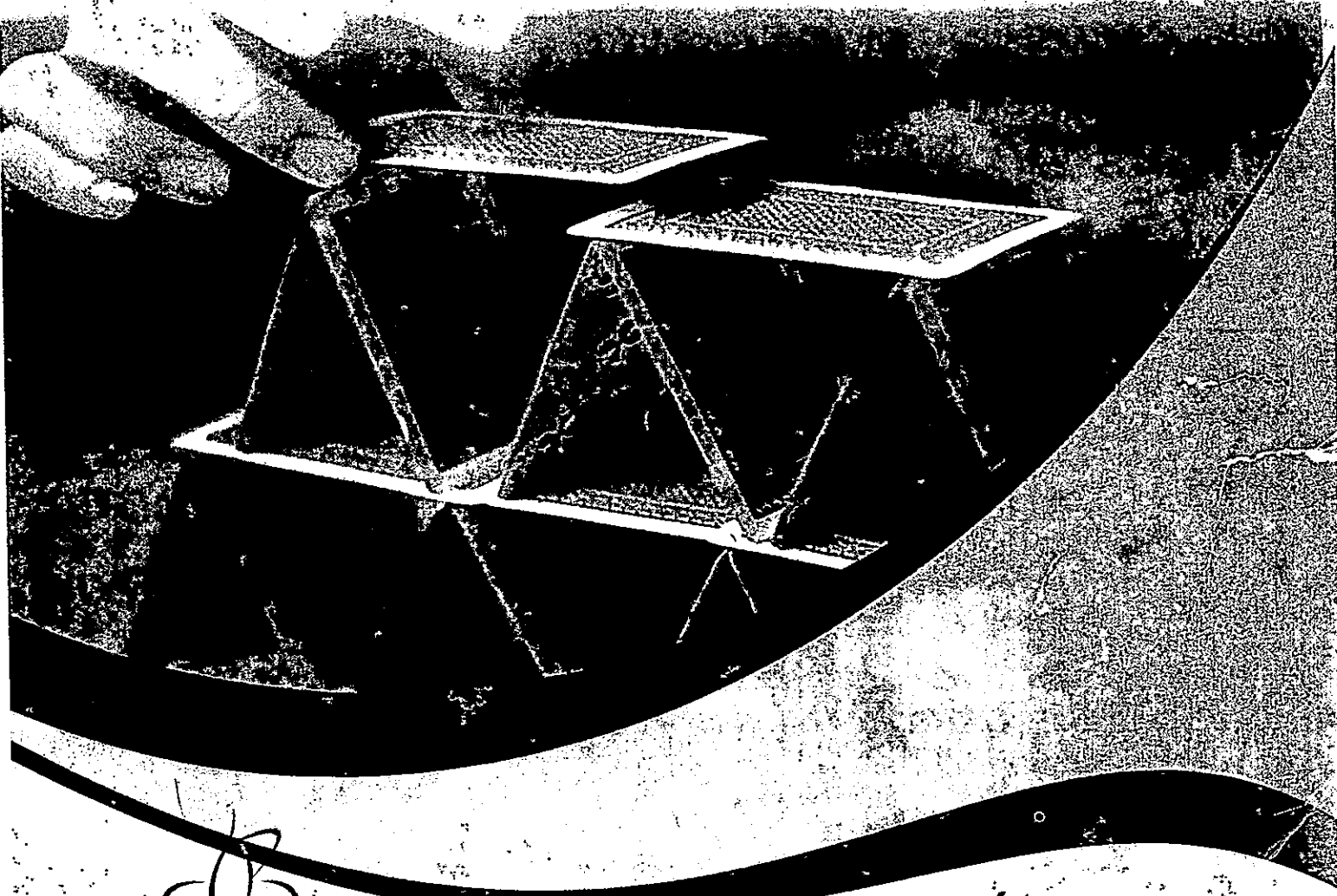
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Read to Lead



Principles of Management



**THAKUR PUBLISHERS
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*Dr. J. Nirubarani
Dr. S. Sathyasundari*

About the Book

Management in all business and organisational activities is the act of getting people together to accomplish desired goals and objectives, using available resources efficiently and effectively. As a process, management refers to a series of inter-related functions. It is the process by which management creates, operates and directs purposive organisation through systematic, coordinated and co-operated human efforts. Management principles are the statements of fundamental truth based on logic which provide guidelines for managerial decision-making and actions.

The book is primarily intended to serve as a text for post graduate students of management and students pursuing various courses in management. More over, this text will introduce students to the fast changing field of management. In addition to the useful sources of information related to **Principles of Management**, variety of tools such as tables, figures and index are used to provide more adapting view to students and make the subject easier for them. Some most common features of this book are:

- Simplicity is its ethos and clarity is its strength.
- The writing is consistent in both level and style and is easy for students to follow.
- Modern thoughts and insights of Principles of Management are based on the construct that have taken place.
- Incorporation of Indian perspectives throughout the text.
- Emphasis on the importance of the Principles of Management.

About the Author



Dr. J. Nirubarani has done MBA (HR and Marketing), M.Phil, PGDCA and Ph.D in Management (Human Resource) from Bharathiar University. Presently she is working as **Professor & Head, Department of MBA at RVS Institute of Management Studies, Coimbatore**. Her areas of interest are HR, Economics, Marketing and General Management Subjects. She has published and presented several papers at State, National and International Conferences and has also organized State, National and International Conferences. She has attended FDPs sponsored by AICTE and IIM-K. She has chalked up experience of 8 years in Industry and 13 years in academics. She has served as **NSS Programme Officer** during the year 2003-2008. Her interests include Reading, Art & Craft. She is an active **Social Worker** and is currently involved in **Community Development Programmes**.



Dr. S. Sathyasundari is working as **Professor & Head, Department of MBA at Shree Venkateshwara Hi-Tech Engineering College, Erode**. She has completed her MBA, M.Phil, PGDCA, Ph.D and is having 14 years of teaching experience and 1 year of industrial experience. She has guided 6 M.Phil students and more than 100 MBA projects. She has attended many National and International Conferences and has published several articles in leading academic National and International Journals. She has presented research papers in National and International Seminars organized by various Universities and Colleges. She is lifetime Member in **ISTE** and **CMA**.

Anna University, Chennai MBA - 1st Semester

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Statistics for Management	Prof. P. Raj Kumar
Economic Analysis for Business	Dr. Geeta Kesavaraj, Dr. G. Hemapriya
Total Quality Management	Dr. V. Sasi Rekha, R. Lakshmi Narayanan
Organisational Behaviour	Dr. M. Latha Natarajan
Accounting for Management	Dr. R. Premkumar
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MRP: ₹140

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www.tppl.org.in

ISBN:978-93-5163-586-4



Principles of Management

ISBN - 978-93-5163-586-4

Edition 2015-16

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Published by :

Thakur Publishers

(Division of Thakur Publication Pvt. Ltd., Lucknow)

House No. 8, Ambu Nagar, Main Road, Goverthanagiri, Avadi,

Chennai-600071. Mob. 9543605656, 8144126950, 9543247241, 8124457101, 9543247130

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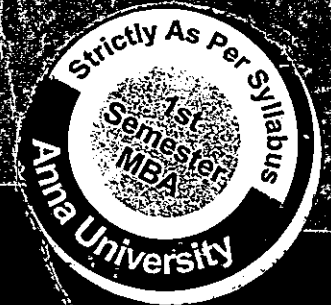
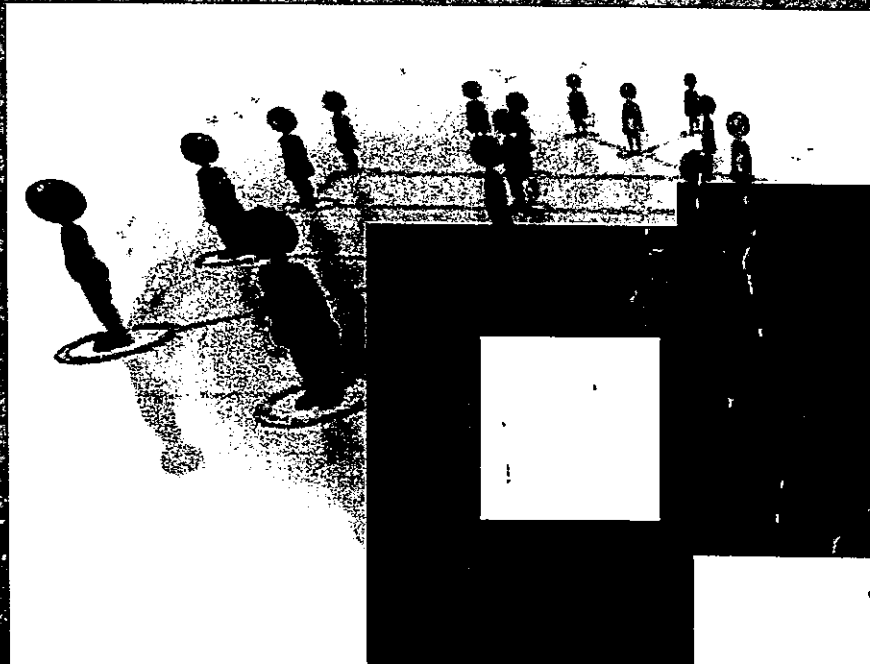
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First Edition: 2017

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- Published by** : Mrs. Meena Pandey for Himalaya Publishing House Pvt. Ltd.,
"Ramdoot", Dr. Bhalerao Marg, Girgaon, Mumbai - 400 004.
Phone: 022-23860170/23863863, Fax: 022-23877178
E-mail: himpub@vsnl.com; Website: www.himpub.com
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- DTP by** : SPS, Bengaluru.
- Printed at** : M/s. Aditya Offset Process (I) Pvt. Ltd., Hyderabad.



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ISBN: 978-93-5273-551-8



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Prof. (Dr.) S. Chitra Devi
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About the Book

This book of "Legal Aspects of Business" covers the various provisions of Acts related to business. An attempt has been made to bring up-to-date information regarding latest Amendments of various Acts. The content of the book is written in a simple language with detailed information. The text is supported with numerous illustrations to enable practical understanding. This book also contains exercise and solved papers to assist the students in preparing for the examination.

About the Author



Prof. (Dr.) S. Chitra Devi presently working in Sri Muthukumaran Institute of Technology, Chennai, department of Manangement Studies with the qualification of MBA., M.Phil., Ph.D. She has completed her doctorate in entrepreneurship development with 22 years of teaching experience in various institution and 10 years research experience. She has published 22 research papers in various international journals and attend more than 20 national and international conferences. She was keynote speaker in conference and chief guest for various events. She has produced doctorate candidate under Bharathiyar University under management.



Dr. S. Sathyasundari is working as a Professor & Head of MBA Department at Shree Venkateshwara Hi-Tech Engineering College, Gobi, Erode District. She has completed MBA, M.Phil, PGDCA, Ph.D and is having 21 Years of teaching Experience and 1 Year of Industrial experience. She has participated and presented several papers at State, National and International conferences and has published several articles in leading academic National and International journals. She has attended various FDPs sponsored by UGC and AICTE. She is lifetime members in ISTE and IACM.



Dr. A. Kanimozhi has over 7 years experience in teaching and Research field. She is able to handle multiple tasks on a daily basis and dependable person when comes to time management. She use creative approach for problem solving and always be energetic & eager to learn new skills. She is able to work in a team and as an individual able to work in evenings and weekends. She is a workaholic, ambitious and hardworking individual, with broad skills and experience in Lectures, Digital designing and Key strength is Communication and Building strong relationships with people in order to deliver the best results when comes to Marketing, Lectures and can mentor the students very well. She is currently working as an Assistant Professor in M.A.M B-SCHOOL always committed to learn more in her Profession from the Head & Management for consistent achievement in career and engaged as a Active member of Mamcet Toastmasters Club and wrote article for Toastmasters International Journals on the topic "Regale", and learning event managing skills as a Yi-Coordinator.

Anna University, MBA 1st Semester

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Published by:

Thakur Publication Pvt. Ltd.

HO: Abhishekpuram, 60 Feet Road, Jankipuram, Lucknow-226021

Mob.: 9235318597/96/95/94/91/22/17, 9335318517

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Books are Available for Online Purchase at: tppl.org.in

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ISBN No. 978-93-5480-106-8

First Edition 2022

Printed at:

Savera Printing Press

Tirupatipuram, Jankipuram Extension, Near AKTU, Lucknow-226031

E-mail: lkospp@gmail.com Mobile No. 9235318506/07

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Semester - IV (Civil Engineering)

STRENGTH OF MATERIALS

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Semester - IV (Civil Engineering)

First Edition : January 2017

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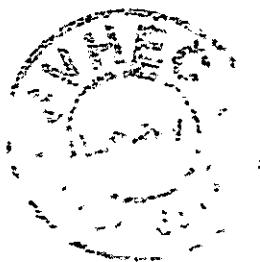


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Printer :

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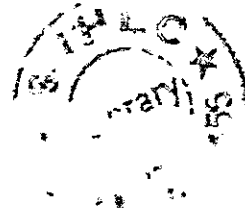
First Edition : June 2019

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Price : Rs.325/-

ISBN : 978-93-87255-52-4



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As per the Latest Syllabus of Anna University, Chennai
(Regulation 2013)

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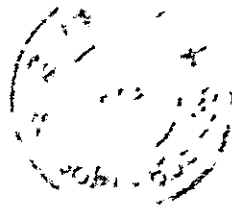
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First Edition : June.2016

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ISBN : 978-93-84634-64-3

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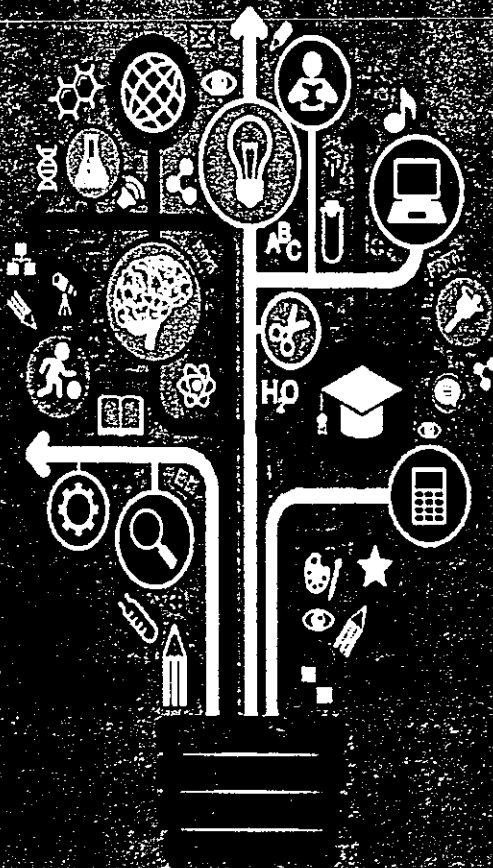
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Information Retrieval Technique

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ISBN No. : 978-93-90614-31-8

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SYLLABUS

INFORMATION RETRIEVAL TECHNIQUES

UNIT I INTRODUCTION

Information Retrieval – Early Developments – The IR Problem – The Users Task – Information versus Data Retrieval - The IR System – The Software Architecture of the IR System – The Retrieval and Ranking Processes - The Web – The e-Publishing Era – How the web changed Search – Practical Issues on the Web – How People Search – Search Interfaces Today – Visualization in Search Interfaces.

UNIT II MODELING AND RETRIEVAL EVALUATION

Basic IR Models - Boolean Model - TF-IDF (Term Frequency/Inverse Document Frequency) Weighting - Vector Model – Probabilistic Model – Latent Semantic Indexing Model – Neural Network Model – Retrieval Evaluation – Retrieval Metrics – Precision and Recall – Reference Collection – User-based Evaluation – Relevance Feedback and Query Expansion – Explicit Relevance Feedback.

UNIT III TEXT CLASSIFICATION AND CLUSTERING

A Characterization of Text Classification – Unsupervised Algorithms: Clustering – Naïve Text Classification – Supervised Algorithms – Decision Tree – k-NN Classifier – SVM Classifier – Feature Selection or Dimensionality Reduction – Evaluation metrics – Accuracy and Error – Organizing the classes – Indexing and Searching – Inverted Indexes – Sequential Searching – Multi-dimensional Indexing.

UNIT IV WEB RETRIEVAL AND WEB CRAWLING

The Web – Search Engine Architectures – Cluster based Architecture – Distributed Architectures – Search Engine Ranking – Link based Ranking – Simple Ranking Functions – Learning to Rank – Evaluations – Search Engine Ranking – Search Engine User Interaction – Browsing – Applications of a Web Crawler – Taxonomy – Architecture and Implementation – Scheduling Algorithms – Evaluation.

UNIT V RECOMMENDER SYSTEM

Recommender Systems Functions – Data and Knowledge Sources – Recommendation Techniques – Basics of Content-based Recommender Systems – High Level Architecture – Advantages and Drawbacks of Content-based Filtering – Collaborative Filtering – Matrix factorization models – Neighborhood models.

CONTENTS

UNIT - 1	INTRODUCTION	1.1 - 1.25
1.1. INFORMATION RETRIEVAL		1.1
1.1.1. Early Developments		1.2
1.1.2. Information Retrieval in Libraries and Digital Libraries		1.3
1.1.3. IR at the Center of the Stage		1.4
1.2. THE IR PROBLEM		1.4
1.2.1. The User's Task		1.5
1.2.2. Information versus Data Retrieval		1.6
1.3. THE IR SYSTEM		1.6
1.3.1. Software Architecture of the IR System		1.6
1.3.2. The Retrieval and Ranking Processes		1.9
1.4. THE WEB		1.11
1.4.1. A Brief History		1.11
1.4.2. The e-Publishing Era		1.12
1.4.3. How the Web Changed Search		1.13
1.4.4. Practical Issues on the Web		1.14
1.5. HOW PEOPLE SEARCH		1.15
1.5.1. Information Lookup versus Exploratory Search		1.15
1.5.2. Classic versus Dynamic Model of Information Seeking		1.16
1.5.3. Navigation versus Search		1.17
1.5.4. Observations of the Search Process		1.18
1.6. SEARCH INTERFACES TODAY		1.19
1.6.1. Getting Started		1.19
1.6.2. Query Specification		1.19
1.6.3. Query Specification Interfaces		1.20
1.6.4. Retrieval Results Display		1.21
1.6.5. Query Reformulation		1.23
1.6.6. Organizing Search Results		1.24
UNIT - 2 MODELING AND RETRIEVAL EVALUATION		2.1 - 2.38
2.1. BASIC IR MODELS		2.1

<i>Information Retrieval</i>	C.3
2.1.1. Modeling and Ranking	2.1
2.1.2. Characterization of an IR Model	2.2
2.1.3. A Taxonomy of IR Model	2.2
2.2. BOOLEAN MODEL	2.3
2.2.1. Drawbacks of the Boolean Model	2.5
2.3. TF-IDF (TERM FREQUENCY/INVERSE DOCUMENT FREQUENCY) WEIGHTING	2.5
2.3.1. Term frequency (TF) weights	2.6
2.3.2. Inverse Document Frequency	2.7
2.3.3. TF-IDF weighting scheme	2.9
2.3.4. Variants of TF-IDF	2.10
2.3.5. TF-IDF Properties	2.12
2.4. VECTOR MODEL	2.12
2.5. PROBABILISTIC MODEL	2.14
2.6. LATENT SEMANTIC INDEXING	2.16
2.7. NEURAL NETWORK MODEL	2.18
2.8. RETRIEVAL EVALUATION	2.21
2.9. PRECISION AND RECALL	2.21
2.9.1. Precision-Recall Appropriateness	2.25
2.10. REFERENCE COLLECTION	2.26
2.11. USER BASED EVALUATION	2.27
2.11.1. Human Experimentation in the Lab	2.27
2.11.2. Side-by-Side Panels	2.28
2.11.3. A/B Testing	2.29
2.11.4. Crowdsourcing	2.29
2.12. RELEVANCE FEEDBACK AND QUERY EXPANSION	2.30
2.12.1. Introduction	2.30
2.12.2. A Framework for Feedback Methods	2.30
2.13. EXPLICIT RELEVANCE FEEDBACK	2.33
2.13.1. Relevance feedback for the vector model (Rocchio Method)	2.34
2.13.2. Relevance Feedback for the Probabilistic Model	2.36
2.13.3. Evaluation of Relevance Feedback	2.37

UNIT - 4	WEB RETRIEVAL AND WEB CRAWLING.....	4.1 - 4.65
4.1. INTRODUCTION TO WEB RETRIEVAL.....		4.1
4.1.1. Exploring the web.....		4.1
4.1.2. Challenges with Web.....		4.1
4.1.2.1. Data Centric Challenges		4.1
4.1.2.2. Interaction Centric Challenges		4.2
4.1.2.3. Other Challenges		4.2
4.2. THE WEB.....		4.3
4.2.1. Characteristics		4.3
4.2.2. Structure of Web Graph.....		4.4
4.2.3. Modeling the Web		4.5
4.2.4. Link analysis.....		4.8
4.3. SEARCH ENGINE ARCHITECTURES.....		4.11
4.3.1. Basic Architecture		4.11
4.3.2. Cluster based Architecture		4.13
4.3.2.1. Caching.....		4.15
4.3.3. Multiple Indexes.....		4.17
4.3.4. Distributed Architectures.....		4.18
4.3.4.1. Harvest Architecture.....		4.18
4.3.4.2. Multi-site Architecture		4.19
4.4. SEARCH ENGINE RANKING.....		4.20
4.4.1. Challenges		4.20
4.4.2. Ranking Signals.....		4.21
4.4.3. Link based Ranking.....		4.22
4.4.3.1. Early Algorithms		4.22
4.4.3.2. PageRank.....		4.23
4.4.3.3. HITS		4.24
4.4.4. Simple Ranking Functions		4.25
4.4.5. Learning to Rank		4.25
4.4.6. Learning the Ranking Function		4.26
4.4.7. Evaluations		26
4.4.8. Web Spam and SEO		28
4.5. SEARCH ENGINE USER INTERACTION.....		29

UNIT - 3	TEXT CLASSIFICATION AND CLUSTERING.....	3.1 - 3.65
3.1.	INTRODUCTION.....	3.1
3.2.	MACHINE LEARNING.....	3.2
3.2.1.	Unsupervised Algorithms.....	3.3
3.2.2.	Supervised Algorithms.....	3.5
3.3.	FEATURE SELECTION OR DIMENSIONALITY REDUCTION.....	3.23
3.4.	EVALUATION METRICS.....	3.28
3.4.1.	Accuracy and Error.....	3.29
3.4.2.	Precision and Recall.....	3.30
3.4.3.	F-measure.....	3.31
3.5.	ORGANIZING THE CLASSES.....	3.32
3.6.	INDEXING AND SEARCHING.....	3.34
3.7.	INVERTED INDEXES.....	3.35
3.7.1.	Basic Concepts.....	3.35
3.7.2.	Full Inverted Indexes.....	3.36
3.7.3.	Searching.....	3.42
3.7.4.	Ranking.....	3.42
3.7.5.	Construction.....	3.46
3.7.6.	Compressed Inverted Indexes.....	3.46
3.7.7.	Structural Queries.....	3.49
3.8.	SIGNATURE FILES.....	3.49
3.9.	SEQUENTIAL SEARCHING.....	3.51
3.9.1.	Simple Strings.....	3.51
3.9.2.	Complex Patterns: Automata and Bit-Parallelism.....	3.54
3.9.3.	Faster Bit-Parallel Algorithms.....	3.57
3.9.4.	Regular Expressions.....	3.59
3.9.5.	Multiple Patterns.....	3.60
3.9.6.	Approximate Searching.....	3.61
3.9.7.	Searching Compressed Text.....	3.61
3.10.	MULTI-DIMENSIONAL INDEXING.....	3.63

4.7.4.4. Combining Policies.....	4.62
4.7.5. Evaluation.....	4.62
4.7.5.1. Evaluating Network Usage.....	4.62
UNIT - 5	
RECOMMENDER SYSTEM	5.1 - 5.25
5.1. INTRODUCTION.....	5.1
5.2. RECOMMENDER SYSTEMS FUNCTIONS.....	5.3
5.2.1. Reasons for the e-service providers to adopt Recommendation Systems.....	5.3
5.2.2. Reasons for the users to adopt Recommendation Systems	5.4
5.3. DATA AND KNOWLEDGE SOURCES	5.5
5.3.1. Items	5.5
5.3.2. Users	5.6
5.3.3. Transactions.....	5.6
5.4. RECOMMENDATION TECHNIQUES.....	5.7
5.4.1. Different classes of recommendation Systems.....	5.7
5.5. BASICS OF CONTENT-BASED RECOMMENDER SYSTEMS.....	5.9
5.6. HIGH LEVEL ARCHITECTURE.....	5.10
5.6.1. Types of feedback.....	5.12
5.6.1.1. Approaches to get explicit feedback.....	5.13
5.7. ADVANTAGES OF CONTENT-BASED FILTERING.....	5.13
5.8. DRAWBACKS OF CONTENT-BASED FILTERING	5.14
5.9. COLLABORATIVE FILTERING	5.15
5.10. ADVANCES IN COLLABORATIVE FILTERING	5.16
5.11. MATRIX FACTORIZATION MODELS.....	5.18
5.11.1. SVD	5.18
5.11.2. SVD++.....	5.20
5.11.3. Time-aware factor models.....	5.20
5.11.3.1. Time changing baseline predictors.....	5.21
5.11.3.2. Time changing factor model.....	5.21
5.12. NEIGHBORHOOD MODELS	5.22
5.12.1. Similarity measures	5.22
5.12.2. Similarity- based interpolation	5.23
5.12.2.1. Concern in standard neighborhood-based methods.....	5.24
5.12.3. Jointly derived interpolation weights	5.24

4.5.1. Search Engine Rectangle Paradigm.....	29
4.5.1.1. Search Rectangle	29
4.5.1.2. Query Languages.....	30
4.5.1.3. Dynamic Query Suggestions	31
4.5.2. The Search Engine Result Page.....	33
4.5.2.1. Result Presentation	33
4.5.2.2. Query Assistance on the SERP	36
4.5.2.3. Actionable Results.....	42
4.5.3. Educating the User	43
4.6. BROWSING	44
4.6.1. Flat Browsing	44
4.6.2. Structure Guided Browsing and Web Directories	45
4.6.3. Hypertext Driven Browsing	46
4.7. WEB CRAWLING.....	47
4.7.1. Applications of Web Crawler.....	47
4.7.1.1. General Web Search	48
4.7.1.2. Vertical Web Search	48
4.7.1.3. Topical Crawling	48
4.7.1.4. Web Characterization	49
4.7.1.5. Web Mirroring	49
4.7.1.6. Web Archiving	49
4.7.1.7. Web Site Analysis	50
4.7.2. Taxonomy.....	50
4.7.3. Architecture and Implementation.....	51
4.7.3.1. Practical Issues	52
4.7.3.2. Taxonomy of web pages.....	53
4.7.3.3. Wrong HTML.....	53
4.7.3.4. Duplicates	54
4.7.3.5. Granularity of Information	54
4.7.3.6. Parallel and Distributed Crawling	4.54
4.7.4. Scheduling Algorithms.....	4.55
4.7.4.1. Selection Policy	4.56
4.7.4.2. Re-visit Policy	4.58
4.7.4.3. Politeness policy.....	4.61

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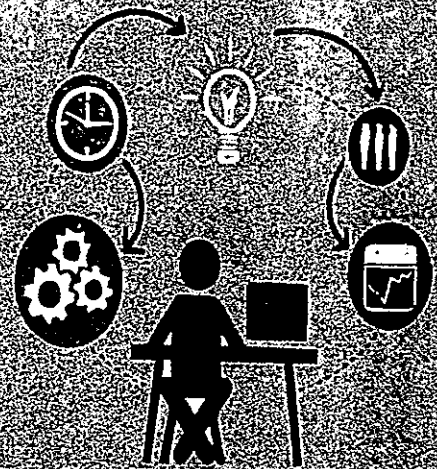
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SYLLABUS

UNIT I HUMAN VALUES

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

UNIT II ENGINEERING ETHICS

Senses of Engineering Ethics – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles – Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination.

UNIT V GLOBAL ISSUES

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Code of Conduct – Corporate Social Responsibility.

CONTENTS

UNIT - I HUMAN VALUES

1.1. Introduction	1.1
1.2. Morals, Values And Ethics	1.1
1.2.1. Morals	1.1
1.2.2. Values	1.2
1.2.3. Ethics	1.2
1.3. Integrity	1.3
1.3.1. What The Word 'Integrity' Means?	1.4
1.3.2. Various Types Of Integrity	1.4
1.4. Work Ethic	1.5
1.4.1. Understanding Work Ethics	1.5
1.4.2. Five Characteristics of a Good Work Ethic	1.5
1.4.3. Factors that Demonstrate a Strong Work Ethic	1.7
1.4.4. How to Increase Employee Work Ethic	1.8
1.4.5. Negative Work Ethic	1.8
1.4.6. Negative Influences of Bad Work Ethics	1.9
1.4.7. How to Deal with Bad Work Ethics in Coworkers	1.9
1.5. Service Learning	1.10
1.5.1. Key Components	1.11
1.5.2. Types of Service Learning	1.12
1.5.3. Comprehensive Action Plan for Service Learning (Capsl)	1.13
1.5.4. Service Learning in Language Education	1.13
1.5.5. Effect on Engineering Education	1.13
1.6. Civic Virtue	1.14
1.6.1. Importance of Civic Virtue	1.14
1.7. Respect For Others	1.14

1.8.	Living Peacefully	1.16
1.8.1.	Ten Ways to Stop Stressing & Start Living Peacefully	1.17
1.9.	Caring	1.18
1.10.	Sharing	1.18
1.11.	Honesty	1.19
1.11.1.	Importance of Honesty	1.19
1.11.2.	Honesty in Engineering	1.20
1.11.3.	Role of Honesty in Business	1.20
1.11.4.	Dishonesty	1.21
1.11.5.	Top 10 Reasons for Employees Get Fired	1.22
1.12.	Courage	1.23
1.13.	Valuing Time	1.23
1.13.1.	What is Time Management?	1.24
1.14.	Co-Operation	1.24
1.14.1.	Types of Co-Operation	1.24
1.14.2.	Social Co-Operation	1.26
1.14.3.	Organizational Co-Operation	1.26
1.15.	Commitment	1.27
1.15.1.	Organizational Commitment and Professional Commitment	1.27
1.15.2.	Three-Component Model of Organizational Commitment	1.27
1.16.	Empathy	1.28
1.16.1.	Types of Empathy	1.29
1.17.	Self-Confidence	1.30
1.17.1.	Steps to Build your Self-Confidence	1.30
1.18.	Character	1.31
1.18.1.	Character and Ethics	1.31
1.18.2.	Characteristics of Ethical People in the Workplace	1.32
1.19.	Spirituality	1.32
1.19.1.	What is Spirituality?	1.32

1.19.2. The Meaning of Spirituality	1.33
1.19.3. Spirituality differs from Religion	1.33
1.19.4. Spirituality and Stress Relief	1.34
1.19.5. Discovering your Spirituality	1.34
1.20 Introduction To Yoga And Meditation For Professional Excellence	1.34
1.20.1. Benefits of Practicing Yoga	1.35
1.20.2. What is Meditation?	1.35
1.20.3. Benefits of Meditation	1.35
1.20.4. How to get the Benefits?	1.37
1.21. Stress Management	1.37
1.21.1. De-Stress with Meditation	1.37

UNIT - 2 ENGINEERING ETHICS

2.0 Introduction	2.1
2.0.1 Scope	2.1
2.0.2 Approach	2.1
2.1 Sense of Engineering Ethics	2.2
2.2 Variety of Moral Issues	2.2
2.3 Types of Inquiries	2.3
2.4 Moral Dilemma	2.5
2.4.1 Definition	2.5
2.4.2 Steps to Solve Dilemma	2.5
2.5 Moral Autonomy	2.6
2.6 Moral Development (Theories)	2.7
2.7 Consensus and Controversy	2.9
2.8 Models Of Professional Roles	2.10
2.8.1. Profession	2.11
2.8.2. Characteristics	2.11

33	2.9 Theories About Right Action (Ethical Theories)	
33	2.9.1. Ethical Theories/Approaches	2.12
34	2.9.2. Case Study: Choice Of The Theory	2.12
34	2.10 Self - Interest	2.17
34	2.10.1. Ethics and Virtue	2.18
35	2.11 Customs	2.19
35	2.12 Religion	2.20
35	2.12.1. Divine Command Ethics	2.21
37	2.13 Uses of Ethical Theories	2.21
37		2.22

UNIT - 3 ENGINEERING AT SOCIAL EXPERIMENTATION

37	3.0. Introduction	
—	3.1. Engineering Experimentation	3.1
1	3.1.1. Engineering Projects Vs. Standard Experiments	3.1
1	3.2 Engineers As Responsible Experimenters	3.2
2	3.2.1. Conscientiousness	3.7
2	3.2.2. Comprehensive Perspective	3.7
3	3.2.3. Moral Autonomy	3.8
	3.2.4. Accountability	3.8
	3.3 Codes of Ethics	3.9
	3.3.1. Purpose of Code of Ethics	3.10
	3.3.2. Features of Engineering Codes of Ethics	3.10
	3.3.3. National Society of Professional Engineers (NSPE)	3.10
	3.3.4. Professional Obligations	3.11
	3.3.5. Other Types of Codes	3.11
	3.3.6. Role of Codes:	3.12
	3.3.7. Some Limitations in Employing Ethical Codes:	3.12
	3.4 A Balanced Outlook on Law	3.13
	3.4.1. Need for Laws:	3.14
		3.14

14	4.8 Confidentiality	4.9
15	4.8.1. Justification for Confidentiality	4.9
15	4.8.2. Types of Confidential Information:	4.10
15	4.8.3. More on Confidentiality	4.11
16	4.9 Conflicts of Interest	4.12
18	4.9.1. Types of Conflicts of Interest	4.13
19	4.9.2. Organizational Conflict of Interest	4.14
19	4.9.3. Other Types of Conflicts of Interests	4.15
27	4.9.4. Examples	4.15
27	4.9.5. Ways to Mitigate Conflicts of Interests	4.16
—	4.10 Occupational Crime	4.17
4.1	4.11 Professional Rights	4.18
4.1	4.12 Employee Rights	4.19
4.2	4.13 Intellectual Property Rights: (IPR)	4.22
4.3	4.14 Discrimination	4.25
4.3	4.14.1. Definitions	4.26
4.4	4.14.2. Racial and ethnic discrimination	4.26
4.4	4.14.3. Caste discrimination	4.28
4.5	4.14.4. Employment discrimination	4.28
4.5	4.14.5. Language discrimination	4.28
4.6	4.14.6. Reverse discrimination	4.29
4.6	4.14.7. Disability discrimination	4.29
7	4.14.8. Religious discrimination	4.29
7	4.14.9. Theories	4.30
7	4.15 Case Study: Power Plant Disaster	4.31
7	4.15.1. Bhopal Disaster	4.31

UNIT - 5 GLOBAL ISSUES

5.0	Introduction	5.1
5.1	Globalization	5.1
5.2	Multinational Corporations	5.1
5.2.1.	International Human Rights:	5.2
5.2.2.	Technology Transfer	5.3
5.2.3.	Appropriate Technology	5.3
5.2.4.	How Appropriate is Aptech?	5.3
5.2.5.	MNCs and Morality:	5.4
5.2.6.	Case Study: Bhopal Gas Tragedy:	5.4
5.2.7.	Ethical Balance	5.5
5.3	Environmental Ethics	5.6
5.3.1.	Categories Of Environmental Ethics	5.7
5.3.2.	Disasters	5.8
5.3.3.	Human-Centered Environmental Ethics:	5.10
5.3.4.	Nature centered environmental ethics:	5.11
5.4	Computer Ethics	5.11
5.4.1.	Types of Issues	5.11
5.4.2.	Computers in Workplace:	5.12
5.4.3.	Property Issues	5.13
5.4.4.	Computer Crime	5.14
5.4.5.	Privacy and Anonymity	5.14
5.4.6.	Professional Responsibility	5.16
5.5	Weapons Development	5.16
5.6	Engineers as Managers	5.17
5.6.1.	Characteristics	5.17
5.6.2.	Managing Conflicts	5.17
5.7	Consulting Engineers	5.18

	5.8 Engineers as Expert Witness	5.20
5.1	5.8.1. Duties	5.21
5.1	5.9 Engineers as Advisors in Planning and Policy	5.22
5.1	5.10 Moral Leadership	5.23
5.2	5.11 Sample Code of Conduct	5.24
5.3	5.11.1. National Society of Professional Engineers	5.24
5.3	5.11.2. The Institute of Electrical & Electronics Engineers	5.24
5.3	5.11.3. Institution of Engineers (India)	5.25
5.4	5.11.4. Indian Institute of Material Management	5.26
5.4	5.11.5. Institution of Electronics And Telecommunication Engineers	5.26
5.5	5.11.6. Engineering Council of India	5.28
5.6	5.11.7. Codes of Ethics for Tata Group	5.28
5.7	5.11.8. The ASME Codes Of Ethics	5.28
5.8	5.11.9. Professional Practice	5.29
10	5.12 Ethics and Codes of Business Conduct in MNC	5.29
11	5.12.1. Special Responsibilities Facing Computer Professionals and Users	5.30
11	5.12.2. Ethical Guidelines for Computer Professionals:	5.30
11	5.12.3. Analyzing a Professional Ethical Scenario	5.31
12		
13	Appendix A – Case Studies	1-28
14	Appendix B – Solved Anna University Question Papers	1-46

4
6
6
7
7
7
8

1st Semester (2017 Regulation)

- Problem Solving & Python Programming
- Communicative English
- Engineering Mathematics - I
- Engineering Physics
- Engineering Chemistry
- Engineering Graphics

3rd Semester (2017 Regulation) CSE

- Digital Principles and System Design
- Data Structures
- Object Oriented Programming
- Communication Engineering

5th Semester (2017 Regulation) CSE

- Computer Networks
- Microprocessors & Microcontrollers
- Theory of Computation
- Object Oriented Analysis & Design

7th Semester (2017 Regulation) CSE

- Principles of Management
- Cryptography & Network Security
- Cloud Computing

ELECTIVES

- Geographical Information System
- Telehealth technology
- Machine Learning Techniques
- Software Project Management
- Service Oriented Architecture
- Multicore Architecture Programming
- Human Computer Interaction

3rd Semester (2017 Regulation) ECE

- Fundamentals of Data Structures in C
- Digital Electronics
- Signals & Systems
- Control System Engineering

5th Semester (2017 Regulation) ECE

- Digital Communication
- Computer Architecture & Organization
- Communication Networks

7th Semester (2017 Regulation) ECE

- Antennas and Microwave Engineering
- Optical Communication
- Embedded & Real Time Systems
- Ad hoc & Wireless Sensor Networks

ELECTIVES

- Cognitive Radio
- Basics of Biomedical Instrumentation
- Medical Electronics

3rd Semester (2017 Regulation) EEE

- Transforms and Partial Differential Equations
- Digital Logic Circuits
- Electrical Machines - I

5th Semester (2017 Regulation) EEE

- Microprocessor & Microcontroller
- Object Oriented Programming

7th Semester (2017 Regulation) EEE

- Principles of Management

3rd Semester (2017 Regulation) IT

- Digital Principles and System Design
- Data Structures
- Object Oriented Programming

5th Semester (2017 Regulation) IT

- Computer Networks
- Microprocessors & Microcontrollers
- Software Engineering

7th Semester (2017 Regulation) IT

- Principles of Management
- Cryptography & Network Security
- Cloud Computing

ELECTIVES

- Machine Learning Techniques
- Software Project Management
- Service Oriented Architecture
- Human Computer Interaction

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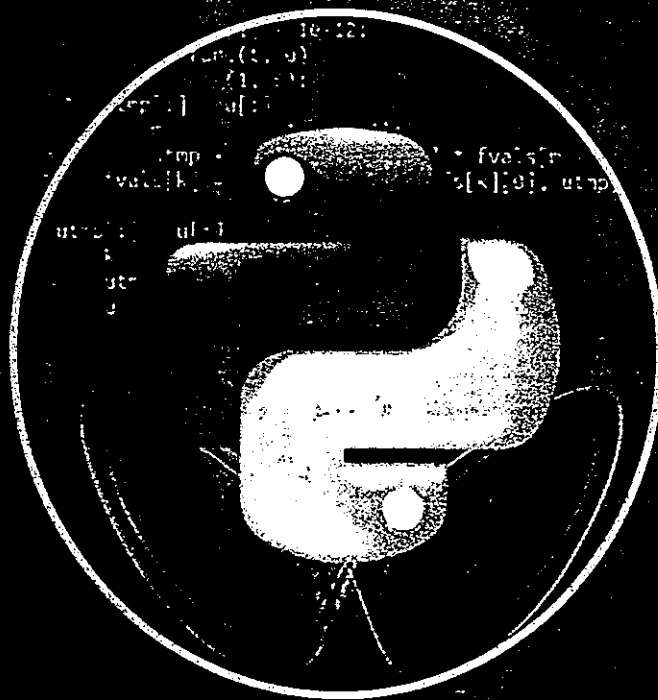


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Problem Solving and Python Programming

Dr.T. Senthil Prakash
R.Premalatha



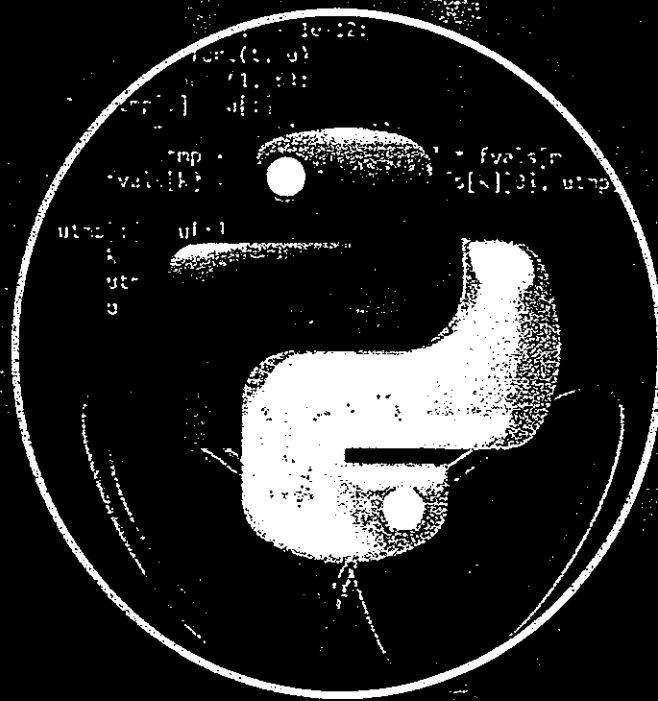
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Problem Solving and Python Programming

Dr.T. Senthil Prakash
R.Premalatha



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Problem Solving and Python Programming

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Ms.R.Premalatha has completed BE and ME in Computer Science and Engineering. She is having Teaching Experience at Engineering College with 4.5 years as an Assistant Professor. She has been received the University Rank holder in ME Computer Science and Engineering in ANNA University, Chennai. She is currently working in Shree Venkateshwara Hi Tech Engineering College as an Assistant Professor. She has published several papers in National and International Conferences and participated in many Seminar and Workshops. Her Area of Interest is networking and Cloud computing.

COURSE OBJECTIVES:

- To understand the basics of algorithmic problem solving.
- To learn to solve problems using Python conditionals and loops.
- To define Python functions and use function calls to solve problems.
- To use Python data structures - lists, tuples, dictionaries to represent complex data.
- To do input/output with files in Python.

UNIT I COMPUTATIONAL THINKING AND PROBLEM SOLVING 9

Fundamentals of Computing – Identification of Computational Problems -Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guess an integer number in a range, Towers of Hanoi.

UNIT II DATA TYPES, EXPRESSIONS, STATEMENTS 9

Python interpreter and interactive mode, debugging; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT III CONTROL FLOW, FUNCTIONS, STRINGS 9

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNIT IV LISTS, TUPLES, DICTIONARIES

9

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing - list comprehension; Illustrative programs: simple sorting, histogram, Students marks statement, Retail bill preparation.

UNIT V FILES, MODULES, PACKAGES

9

Files and exceptions: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file, Voter's age validation, Marks range validation (0-100).

TOTAL : 45 PERIODS

COURSE OUTCOMES:

Upon completion of the course, students will be able to

CO1: Develop algorithmic solutions to simple computational problems.

CO2: Develop and execute simple Python programs.

CO3: Write simple Python programs using conditionals and loops for solving problems.

CO4: Decompose a Python program into functions.

CO5: Represent compound data using Python lists, tuples, dictionaries etc.

CO6: Read and write data from/to files in Python programs.

CONTENTS

UNIT-I

COMPUTATIONAL THINKING AND PROBLEM SOLVING

1.1	FUNDAMENTALS OF COMPUTING COMPUTER SYSTEMS	1.1
1.2	COMPUTING DEVICES	1.4
1.3	IDENTIFICATION OF COMPUTATIONAL PROBLEM	1.16
1.4	ALGORITHMS	1.18
1.5	BUILDING BLOCKS OF ALGORITHMS	1.21
	1.5.1 Statements	1.21
	1.5.2 State	1.23
	1.5.3 Control Flow	1.23
	1.5.4 Functions	1.25
1.6	NOTATIONS	1.25
	1.6.1 Pseudo Code	1.26
	1.6.2 Flowchart	1.29
	1.6.3 Programming Languages	1.36
1.7	ALGORITHMIC PROBLEM SOLVING	1.38
1.8	SIMPLE STRATEGIES FOR DEVELOPING ALGORITHMS	1.42
1.9	ILLUSTRATIVE PROBLEMS	1.52
	1.9.1 Find minimum in a list python	1.52
	1.9.2. Find the insert a card in a list of sorted cards	1.53
	1.9.3. Find the guess an integer number in a range	1.57
	1.9.4. Find the towers of Hanoi: class Tower	1.59

UNIT-II

DATA TYPES, EXPRESSIONS, STATEMENTS

2	INTRODUCTION	2.1
2.1	APPLICATIONS OF PYTHON IN SOLVING VARIOUS ENGINEERING PROBLEMS	2.5
2.2	PYTHON INTERPRETER AND INTERACTIVE MODE	2.8
	2.2.1 Interactive Mode	2.9

2.3	VALUES AND TYPES	2.10
2.3.1	Value	2.10
2.3.2	Types	2.10
2.4	VARIABLES	2.20
2.5	EXPRESSION	2.24
2.6	STATEMENTS	2.24
2.7	TUPLE ASSIGNMENT	2.26
2.8	PRECEDENCE OF OPERATORS	2.28
2.9	COMMENTS	2.31
2.10	ILLUSTRATIVE PROGRAMS	2.33

UNIT III

CONTROL FLOW, FUNCTIONS, STRINGS

3.1	BOOLEAN VALUES	3.1
3.2	OPERATORS	3.2
3.2.1	Types of Operators	3.2
3.2.2	Python Operators Precedence	3.13
3.3	CONDITIONAL STATEMENT	3.14
3.3.1	If Statement	3.15
3.3.2	If else statement	3.16
3.3.3	Nested if-else	3.17
3.3.4	If-elif-else statement	3.19
3.4	ITERATION - LOOPING	3.21
3.4.1	While loop	3.22
3.4.2	for loop	3.24
3.5	UNCONDITIONAL LOOPING STATEMENTS	3.26
3.5.1	Break	3.26
3.5.2	Continue statement	3.27
3.5.3	Pass statement	3.28
3.6	FRUITFUL FUNCTIONS	3.29
3.6.1	Return Values	3.30
3.6.2	Program development	3.32
3.6.3	Parameters	3.35
3.6.4	Local and Global Scope	3.37

4.3.2	Properties of Dictionary Keys	4.24
4.3.3.	Dictionary Methods	4.24
4.3.4.	Built-in Dictionary Functions	4.26
4.3.5.	Advanced List Processing – List Comprehension	4.27
4.3.6.	Other Dictionary Operations	4.28
4.4	ILLUSTRATIVE PROGRAMS	4.28
4.4.1	Selection Sort	4.28
4.4.2.	Insertion Sort	4.32
4.4.3.	Merge Sort	4.34
4.4.4.	Python program 1 for Histogram	4.39
4.4.5.	Python program 2 for Histogram	4.39
4.4.6.	Students marks statement	4.40
4.4.7.	Retail bill preparation	4.41

UNIT V

FILES, MODULES, PACKAGES

5	FILES	5.1
5.1	CREATING TEXT FILE	5.1
5.2	FILE OPERATION	5.2
5.2.1.	Opening a file	5.2
5.2.2	Closing a File	5.3
5.2.3	Reading from file	5.4
5.2.4.	Writing to file	5.6
5.3	Python File Methods	5.7
5.4	FILE MANIPULATION	5.8
5.4.1.	rename()	5.8
5.4.2.	remove()	5.8
5.4.3	File Positions	5.9
5.4.4.	with statement	5.10
5.5	COMMAND LINE ARGUMENTS	5.10
5.6	ERRORS AND EXCEPTIONS	5.14
5.6.1	Errors	5.14
5.6.2	Exceptions	5.17

4.24	5.7 EXCEPTION HANDLING	5.18
4.24	5.7.1 Try...except statement	5.18
4.26	5.7.2 Assertion Statement	5.22
4.27	5.8 MODULES	5.23
4.28	5.9 PACKAGES	5.30
4.28	5.10 ILLUSTRATIVE PROGRAMS	5.31
4.28	5.10.1 Python program for word count from input file	5.31
4.32	5.10.2. Python program to copy file	5.32
4.34	5.10.3. Python program to Voter's age validation	5.33
4.39	5.10.4. Python program to Marks range validation (0-100).	5.34
4.39	Two Marks Questions and Answers	
4.40		
4.41		

5.1
 5.1
 5.2
 5.2
 5.3
 5.4
 5.6
 5.7
 5.8
 5.8
 5.8
 5.9
 5.10
 5.10
 5.14
 5.14
 5.17

Object Oriented Programming

Dr. T. Senthil Prakash

N. Kalpana

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OBJECT ORIENTED PROGRAMMING

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August, 2022

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PREFACE

This book is designed for the Computer Science and Engineering under graduate program in an object-oriented programming language using Java. It has been designed to develop the java applications. The language we use to teach object-oriented programming is Java.

Our approach in this book is to regard Java as a language that readers will want to use as a primary tool in many different areas of their programming work - not just for creating programs with graphical content within Web pages. For this reason, we have provided the contents to understand Object Oriented Programming concepts and basic characteristics of Java. To know the principles of packages, inheritance and interfaces. To develop a java application with threads and generics classes, to define exceptions and use I/O streams, to design and build Graphical User Interface Application using JAVAFX.

The main outcome of this book will be to apply the concepts of classes and objects to solve simple problems and to develop programs using inheritance, packages and interfaces which make use of exception handling mechanisms and multithreaded model to solve real world problems for to build Java applications with I/O packages, string classes, Collections and generics concepts and integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications.

ACKNOWLEDGEMENT

"Object-oriented programming had boldly promised "to model the world." Well, the world is a scary place where bad things happen for no apparent reason, and in this narrow sense I concede that OO does model the world."

— Dave Fancher, -

First and foremost, I praise and thank our Lord Almighty for His blessings for giving strength and confidence to carry out this work successfully.

We deem it a privilege to thank our Management, Principal for their encouragement and support in publishing this book successfully.

We would like to express my deep and sincere gratitude to our publisher and other supportive persons for their continuous motivation and constant support in all our endeavours.

Our heartfelt thanks to our department faculty members and also The Charulatha Publications for their fruitful support in structuring the book and publishing it successfully.

Finally, we are deeply indebted to our Parents and the family members for their sincere encouragement and support throughout the work.

We also wish to thank everyone for investing your valuable time and attention in this book.

**Dr. T. Senthil Prakash
N. Kalpana**

SYLLABUS

CS3391 . OBJECT ORIENTED PROGRAMMING

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To understand Object Oriented Programming concepts and basics of Java programming language
- To know the principles of packages, inheritance and interfaces
- To develop a java application with threads and generics classes
- To define exceptions and use I/O streams
- To design and build Graphical User Interface Application using JAVA FX

UNIT I INTRODUCTION TO OOP AND JAVA 9

Overview of OOP – Object oriented programming paradigms – Features of Object Oriented Programming – Java Buzzwords – Overview of Java – Data Types, Variables and Arrays – Operators – Control Statements – Programming Structures in Java – Defining classes in Java – Constructors- Methods -Access specifiers - Static members- Java Doc comments.

UNIT II INHERITANCE, PACKAGES AND INTERFACES 9

Overloading Methods – Objects as Parameters – Returning Objects –Static, Nested and Inner Classes. Inheritance: Basics– Types of Inheritance -Super keyword -Method Overriding – Dynamic Method Dispatch –Abstract Classes – final with Inheritance. Packages and Interfaces: Packages – Packages and Member Access –Importing Packages – Interfaces.

UNIT III EXCEPTION HANDLING AND MULTITHREADING 9

Exception Handling basics – Multiple catch Clauses – Nested try Statements – Java's Built-in Exceptions – User defined Exception. Multithreaded Programming: Java Thread Model–Creating a Thread and Multiple Threads – Priorities – Synchronization – Inter Thread Communication- Suspending – Resuming, and Stopping Threads –Multithreading. Wrappers – Auto boxing.

UNIT IV I/O, GENERICS, STRING HANDLING

9

I/O Basics – Reading and Writing Console I/O – Reading and Writing Files. Generics: Generic Programming – Generic classes – Generic Methods – Bounded Types – Restrictions and Limitations. Strings: Basic String class, methods and String Buffer Class.

UNIT V JAVAFX EVENT HANDLING, CONTROLS AND COMPONENTS

9

JAVAFX Events and Controls: Event Basics – Handling Key and Mouse Events. Controls: Checkbox,ToggleButton – RadioButtons – ListView – ComboBox – ChoiceBox – Text Controls – ScrollPane. Layouts – FlowPane – HBox and VBox – BorderPane – StackPane – GridPane. Menus – Basics – Menu – Menu bars – MenuItem.

COURSE OUTCOMES:

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

CO1 : Apply the concepts of classes and objects to solve simple problems

CO2 : Develop programs using inheritance, packages and interfaces

CO3 : Make use of exception handling mechanisms and multithreaded model to solve real world problems

CO4 : Build Java applications with I/O packages, string classes, Collections and generics concepts

CO5 : Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications

TOTAL : 45 PERIODS

TEXT BOOKS:

1. Herbert Schildt, "Java: The Complete Reference", 11th Edition, McGraw Hill Education, New Delhi, 2019
2. Herbert Schildt, "Introducing JavaFX 8 Programming", 1st Edition, McGraw Hill Education, New Delhi, 2015

REFERENCE:

1. Cay S. Horstmann, "Core Java Fundamentals", Volume 1, 11th Edition, Prentice Hall, 2018

CONTENTS

UNIT-I

INTRODUCTION TO OOP AND JAVA

1.1	Introduction	1.1
1.2	Overview of OOP	1.1
1.3	Introduction to OO Paradig	1.3
1.4	Features of Object Oriented Programming	1.9
1.5	Java Buzz Word	1.10
1.6	Overview of Java	1.13
	1.6.1 Data Types	1.16
	1.6.2 Variables and Arrays	1.20
	1.6.3 Operators	1.26
	1.6.4 Control Statements	1.32
	1.6.5 Programming Structures in Java	1.45
	1.6.6 Defining Classes in Java	1.50
1.7	Constructors-Methods	1.55
1.8	Access Specifies	1.59
1.9	Static Members	1.65
1.10	Javadoc Comments	1.67

UNIT - II

INHERITANCE, PACKAGES AND INTERFACES

2.1	Overloading Methods	2.1
2.2	Objects as Parameters	2.12
2.3	Returning Objects	2.20
2.4	Understanding Static	2.28
2.5	Nested and Inner Classes	2.30
2.6	Inheritance Basics	2.34
	2.6.1 Inheritance	2.40
	2.6.2 Types of Inheritance	2.41
2.7	Using Super	2.51
2.8	Method Overriding	2.57

2.9	Dynamic Method Dispatch	2.60
2.10	Abstract Classes	2.64
2.11	Final With Inheritance	2.68
2.12	Packages And Interfaces	2.69
	2.12.1 Packages	2.69
	2.12.2 Defining A Package	2.70
	2.12.3 Access Protection	2.73
2.13	Package and Member Access	2.74
2.14	Importing Packages	2.80
2.15	Interfaces	2.82
	2.15.1 Defining an Interface	2.82
	2.15.2 Implementing Interfaces	2.83
	2.15.3 Partial Implementations	2.85
	2.15.4 Nested Interfaces	2.86
	2.15.5 Applying Interfaces	2.87
	2.15.6 Variables in Interfaces	2.92
	2.15.7 Interfaces Can Be Extended	2.95

UNIT - III

EXCEPTION HANDLING AND MULTITHREADING

3.1	Exception Handling Basics	3.1
	3.1.1 Introduction	3.1
3.2	Multiple catch Clauses	3.3
3.3	Nested try Statements	3.9
3.4	Types of Exception in Java	3.18
3.5	Java's Built-in Exceptions	3.18
	3.5.1 Chained Exceptions	3.23
3.6	User defined Exception	3.26
3.7	Multithreaded Programming	3.44
3.8	Java Thread Model	3.47
3.9	Creating Multiple Threads	3.57
3.10	Thread Priority	3.63
3.11	Synchronization	3.69

3.12	Inter Thread Communication	3.84
3.13	Suspending, Resuming, and Stopping Threads	3.87
3.14	The Modern Way of Suspending, Resuming, and Stopping Threads	3.91
3.15	Using Multithreading	3.94
3.16	Type Wrappers	3.94
3.17	Autoboxing	3.97
3.18	Autoboxing and Methods	3.98

UNIT - IV

I/O, GENERICS, STRING HANDLING

4.1	I/O Basics	4.1
4.2	Reading and Writing Console I/O	4.10
	4.2.1 Reading Input from Console	4.10
	4.2.1.1 Reading Input with Readline()	4.11
	4.2.1.2. Reading Input with Readpassword()	4.11
	4.2.1.3. Read Input with Reader()	4.12
	4.2.2. Writing Output to Console	4.12
	4.2.2.1. Writing with System.Out.Println	4.12
	4.2.2.2. Writing with Printf()	4.12
4.3	Reading and Writing Files	4.13
	4.3.1. Reader, Input Stream Reader, File Reader and Buffered Reader	4.13
	4.3.2. Writer, Output Stream Writer, File Writer and Buffered Writer	4.13
	4.3.3. Character Encoding and Charset	4.14
	4.3.4. Java Reading from Text File Example	4.15
	4.3.5. Java Writing to Text File Example	4.17
4.4	Generics	4.21
	4.4.1 Types of Java Generics	4.21
	4.4.2 Generic Functions	4.23
	4.4.3 Generics Work Only with Reference Types	4.24
	4.4.4 Generic Types Differ Based on Their Type Arguments	4.25
	4.4.5 Type Parameters in Java Generics	4.26
4.5	Generic Class	4.29
	4.5.1 Advantages of Java Generics	4.31

4.6	Generic Methods	4.33
4.7	Bounded types with Generics	4.34
	4.7.1 Multiple Bounds	4.39
4.8	Restrictions on Generics	4.40
4.9	String Class	4.45
4.10	String Methods	4.47
4.11	String Buffer Class	4.55

UNIT V

JAVA FX EVENT HANDLING, CONTROLS AND COMPONENTS

5.0	Introduction About Java FX	5.1
5.1	Javafx Key Features	5.1
5.2	What Is Javafx?	5.2
5.3	Java FX Events and Controls	5.2
	5.3.1 Event Basics	5.2
	5.3.2 Syntax of JavaFX Event	5.3
	5.3.3 How JavaFX Event Handling Works?	5.4
	5.3.4 Introducing the Button Control	5.4
	5.3.5 Events in JavaFX	5.5
	5.3.6 Event Handling	5.6
	5.3.7 Phases of Event Handling in JavaFX	5.6
	5.3.8 A JavaFX Application Skeleton	5.7
5.4	Javafx - UI Controls	5.9
5.5	javafx - Layout Panes	5.19
	5.5.1 Creating a Layout	5.20
	5.5.1.1 Creating Nodes	5.20
	5.5.1.2 Instantiating the Respective Class	5.20
	5.5.1.3 Setting the Properties of the Layout	5.20
	5.5.1.4 Adding the Shape Object to the Group	5.21
	5.5.2 Layout Panes	5.21
	5.5.2.1 JavaFX - Layout Panes HBox	5.22
	5.5.2.2 JavaFX - Layout Panes VBox	5.25
	5.5.2.3 JavaFX - Layout BorderPane	5.28

	5.5.2.4 JavaFX - Layout Stackpane	5.30
	5.5.2.5 JavaFX - Layout GridPane	5.33
5.6	Javafx Menus	5.37
	5.6.1 Introducing JavaFX Menus	5.37
	5.6.2 Menu Basics	5.37
	5.6.3 An Overview of MenuBar, Menu, and MenuItem	5.39
	5.6.3.1 MenuBar	5.40
	5.6.3.2 Menu	5.41
	5.6.3.3. MenuItem	5.42
	5.6.4 Create a Main Menu	5.42
	TWO MARKS (Q & A)	

August, 2022

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ISBN: 978-93-95211-21-5

Publisher: The Charulatha Publications

Printer Detail: The Charulatha Publications



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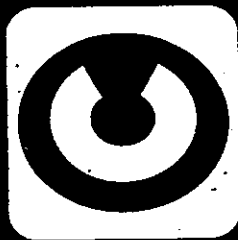
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West Mambalam, Chennai - 33.**

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Email : thecharulathapublicationsit@gmail.com

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PROGRAMMING

PROGRAMMING IN C

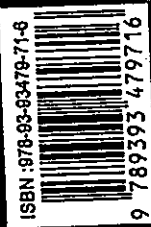
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ISBN : 978-83-83479-71-8
9 789393 479716

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West Mambalam, Chennai - 33.
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Email : thecharulathapublications@gmail.com

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March, 2022

Price :Rs. 425 /-

ISBN No. : 978-93-93479-71-6

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PREFACE

In view to the persistent demand of B.E and B.Tech aspirants and necessity of good study materials specifically aimed at Engineering examinations, it gives us great pleasure to present before you an unique book of Programming in C...

This book is specially designed to cover the syllabus revised by Anna University, Chennai under the Regulation 2021 in most comprehensive and intensive manner. The book comprises of five units covering the entire syllabus. The complete subject matter has been compiled in a simple, compact and precise manner.

This book is written for students with no previous programming experience or programmers who already know C and want to improve their style and reliability. You should have access to a computer and know how to use the basic functions such as a text editor and the filesystem.

We hope the students would really benefit out of this book and perform well in the university examinations. The suggestions in any form to improve this book are quiet welcome and appreciable and will be duly acknowledged.

Authors

PROGRAMMING IN C

L T P C
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CS3251

COURSE OBJECTIVES:

- To understand the constructs of C Language.
- To develop C Programs using basic programming constructs
- To develop C programs using arrays and strings
- To develop modular applications in C using functions
- To develop applications in C using pointers and structures
- To do input/output and file handling in C

UNIT I BASICS OF C PROGRAMMING 9

Introduction to programming paradigms – Applications of C Language - Structure of C program - C programming: Data Types - Constants – Enumeration Constants - Keywords – Operators: Precedence and Associativity - Expressions - Input/Output statements, Assignment statements – Decision making statements - Switch statement - Looping statements – Preprocessor directives - Compilation process

UNIT II ARRAYS AND STRINGS 9

Introduction to Arrays: Declaration, Initialization – One dimensional array – Two dimensional arrays - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search.

UNIT III FUNCTIONS AND POINTERS 9

Modular programming - Function prototype, function definition, function call, Built-in functions (string functions, math functions) – Recursion, Binary Search using recursive functions – Pointers – Pointer operators – Pointer arithmetic – Arrays and pointers – Array of pointers – Parameter passing: Pass by value, Pass by reference.

UNIT IV STRUCTURES AND UNION 9

Structure - Nested structures – Pointer and Structures – Array of structures – Self referential structures – Dynamic memory allocation - Singly linked list – typedef – Union - Storage classes and Visibility.

UNIT V FILE PROCESSING 9

Files – Types of file processing: Sequential access, Random access – Sequential access file - Random access file - Command line arguments.

COURSE OUTCOMES:

Upon completion of the course, the students will be able to

- CO1: Demonstrate knowledge on C Programming constructs CO2: Develop simple applications in C using basic constructs
- CO3: Design and implement applications using arrays and strings
- CO4: Develop and implement modular applications in C using functions.CO5: Develop applications in C using structures and pointers.
- CO6: Design applications using sequential and random access file processing.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. Reema Thareja, "Programming in C", Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie, D.M, "The C Programming language", Second Edition, Pearson Education, 2015.

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1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eighth edition, Pearson Education, 2018.
2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.
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5. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", 1st Edition, Pearson Education, 2013.

CONTENTS

UNIT-I

BASICS OF C PROGRAMMING

1.1	Introduction to Programming Paradigms	1.1
1.1.1	Unstructured Programming	1.1
1.1.2	Structured Programming	1.1
1.2	Applications of C Programming	1.7
1.3	Structure of a C Program	1.8
1.4	Lexical Elements of C	1.11
1.5	Character Set	1.11
1.6	Delimiters	1.13
1.7	Keywords	1.13
1.8	Identifiers	1.13
1.9	Data Types	1.14
1.9.1	Primary Data Types	1.15
1.9.2	Derived Data Types	1.18
1.9.3	User Defined Data Types	1.20
1.10	Constants	1.21
1.10.1	Integer Constants	1.22
1.10.2	Floating Point Constant (or) Real Constants	1.23
1.10.3	Character Constants	1.24
1.10.4	String Constants	1.24
1.11	Enumeration Constants	1.24
1.12	Escape Sequence Character	1.26
1.13	Variables and Declaration	1.27
1.14	Constant and Volatile Variable	1.28
OPERATORS AND EXPRESSIONS		
1.15	Introduction	1.29
1.16	Arithmetic Operators	1.29
1.16.1	Binary Operators	1.29
1.16.2	Unary Operator	1.31
1.16.2.1	Size of Operator	1.34
1.16.2.2	Ampersand Operator	1.34
1.17	Relational Operators	1.35
1.18	Logical Operators	1.37

1.19	Assignment Operator	1.38
1.20	Short Hand Assignment Operators	1.38
1.21	Bitwise Operators	1.40
1.22	Conditional Operator	1.44
1.23	Comma Operator	1.45
1.24	Operator Precedence and Associativity	1.46
1.25	Arithmetic Expression	1.47
1.26	Evaluation of Arithmetic Expressions	1.48
1.27	Type Casting	1.49
INPUT AND OUTPUT IN C		
1.28	Introduction	1.52
1.29	Input and Output Functions	1.52
1.30	Character Oriented I/O Functions	1.52
1.30.1	Reading a Character	1.52
1.30.2	Writing a Character	1.53
1.31	String Oriented Input/ Output Functions	1.58
1.32	Formatted Input Function	1.59
1.33	Formatted Output Function	1.64
1.34	Assignment Statements	1.65
CONTROL STATEMENTS		
1.35	Introduction	1.70
1.36	Selective Construct (or) Decision Making (or) Branching Statements	1.71
1.36.1	Simple if statement	1.71
1.36.2	If-Else Statement	1.73
1.36.3	Conditional Expression	1.75
1.36.4	If-else-if Statement	1.77
1.36.5	Nested if Statement	1.82
1.36.6	Switch()Case statement	1.84
1.37	Looping Construct	1.92
1.37.1	For Loop Statement	1.92
1.37.2	While Loop Statement	1.95
1.37.3	Do While Statement	1.98
1.38	Unconditional Statements	1.102
1.38.1	Break Statement	1.102
1.38.2	Continue Statement	1.102
1.38.3	Goto Statement	1.103

5.2	Types Of File Processing: Sequential Access, Random Access	5.7
5.3	Reading Sequential Access File	5.8
5.4	Read Numbers from File and Calculate Average	5.9
5.5	Random Access File	5.10
5.5.1	Functions for Selecting a Record Randomly	5.10
5.6	Command Line Arguments	5.16

4.4	Structure Initialization	4.14
4.5	Self-Referential Structure	4.18
4.5.1	Types of Self-Referential Structures	4.19
4.5.2	Self Referential Structure with Single Link	4.19
4.5.3	Self Referential Structure with Multiple Links	4.19
4.6	Dynamic Memory Allocation	4.19
4.6.1	Dynamic Memory Allocation	4.20
4.6.1.1	Malloc() Function	4.20
4.6.1.2	Calloc() Function	4.21
4.6.1.3	Realloc() Function	4.22
4.6.1.4	Free() Function	4.22
4.7	Singly Linked List	4.27
4.7.1	Introduction to Linked List Implementation	4.27
4.7.2	Types of Linked List	4.28
4.7.3	Singly Linked List	4.28
4.7.4	Operations on Singly Linked List	4.28
4.8	Typedef	4.51
4.8.1	Typedef and Pointers	4.52
4.9	Union	4.53
4.9.1	Characteristic of Union	4.53
4.9.2	Operations on A Union	4.56
4.9.3	Comparison Between Structures and Unions	4.57
4.9.4	Comparison Between Arrays and Structures	4.57
4.10	Storage Classes and Visibility	4.58
4.10.1	C Language Uses 4 Storage Classes, namely	4.58
4.10.2	Auto	4.59
4.10.3	Extern	4.59
4.10.4	Static	4.60
4.10.5	Register	4.60

UNIT V FILE PROCESSING

5.1	Introduction	5.1
5.1.1	Types of Files	5.1
5.1.2	File Operations	5.2

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Type:

Copyright

Registration Number:

1193880

Status:

Registered

Registered:

2022-06-06

Category of Work:

Literary

Interested Parties:

Owner:

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Last updated on:

2022-11-30

OFFICIAL JOURNAL OF THE PATENT OFFICE

ISSUE NO. 54/2016

FRIDAY

DATE: 30/12/2016

(12) PATENT APPLICATION PUBLICATION
(19) INDIA

(21) Application No. 201641041443 A

(22) Date of filing of Application : 05/12/2016

(43) Publication Date : 30/12/2016

54) Title of the invention: A SELF-POWERED COMMUNICATION TOWER WITH MULTIPLE TRANSMISSION SYSTEM

51) International classification	:H04B 1/00	71) Name of Applicant :
(31) Priority Document No	:NA	1) ALLINNOV RESEARCH AND DEVELOPMENT PRIVATE LIMITED
(32) Priority Date	:NA	Address of Applicant : D. NO.: 29B, BAIRAPPA COLONY, KRISHNAGIRI -635001, Tamil Nadu, INDIA
(33) Name of priority country	:NA	
(86) International Application No	:NA	(72) Name of Inventor :
Filing Date	:NA	1) SUNDARPAUL S
(87) International Publication No	:NA	2) PREM CHARLES I
(61) Patent of Addition to Application Number	:NA	3) DEVIREDDY SRINIVASA KUMAR
Filing Date	:NA	4) PRASANTH K
(62) Divisional to Application Number	:NA	5) PREMKUMAR M
Filing Date	:NA	6) SATHIYAMURTHY S
		7) ANBARASU M
		8) MARIMUTHU K
		9) MARSALINE BENO M
		10) THANGAVEL P
		11) PRABU M
		12) ARULANANTHAM D
		13) VIJAYAKUMAR S
		14) VIJAYAKUMAR M
		15) SAHITHULLAH M
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(57) Abstract : ABSTRACT A SELF-POWERED COMMUNICATION TOWER WITH MULTIPLE TRANSMISSION SYSTEM. The present invention provides a self-powered communication tower with multiple transmission system. More specifically, the invention provides a communication tower with at least one power generating system comprising of a plurality of solar panels and a plurality of wind turbines; and at least one communication device comprising of at least one radio transmitter, at least one network transmitter and at least one broadcast transmitter without interference problems; and at least one base transceiver station. The invention provides a construction tower, wherein the height of the tower is around 600 mtrs, comprising of at least one inflatable balloon filled with an inert gas which is covered with a plurality of solar panels, and a pillar which is mounted around with a plurality of aerodynamic wind turbines, a plurality of transmission devices, and a base transceiver station at the bottom. The invention provides a communication system which relies on non-fuel renewable energy and is economical, and environmentally safe. Figure 1 on Sheet 1 of the drawings may accompany the abstract when published.

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241055805 A

(19) INDIA

(22) Date of filing of Application :29/09/2022

(43) Publication Date : 14/10/2022

(54) Title of the invention : DESIGN AND ANALYSIS OF POLYDIMETHYLSILOXANE BASED MICRO STRCUTURED CHANNEL ARRAYS FOR DAMPING OF PASSIVE VIBRATION

(51) International classification :A61B0005110000, G06K0009520000, F16F0015040000, G06K0009000000, B26D0003140000

(86) International Application No :PCT//
Filing Date :01/01/1900

(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA
Filing Date :NA

(62) Divisional to Application Number :NA
Filing Date :NA

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(57) Abstract :

NO.2/14, VAITHIYALINGAM STREET, NK NAGAR, TINDIVANAM – 604 001.

No. of Pages : 27 No. of Claims : 3

(12) INNOVATION PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 2021105514 A4**

(54) Title
Method of synthesising hybrid metal sand composite and 3D Printing thereof optimising using DL

(51) International Patent Classification(s)
B22F 1/00 (2006.01) **B33Y 70/10 (2020.01)**
B22F 3/00 (2021.01) **B33Y 80/00 (2015.01)**
B22F 10/10 (2021.01) **B22F 3/24 (2006.01)**

(21) Application No: **2021105514** (22) Date of Filing: **2021.08.14**

(45) Publication Date: **2022.01.13**

(45) Publication Journal Date: **2022.01.13**

(45) Granted Journal Date: **2022.01.13**

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Abstract: -

The invention is all about the synthesis of weird metal alloy with sand along with simple 3D printing method. During synthesis, need to identify the suitable binder in this case, which plays a pivotal role. The synthesised material should be in a suitable state to print, for that simple 3D printing technique is used along with modification of supplying the heat from the printer bed. The post process is carried out after printing it should be coated with a layer of same metal and or metal alloys. It is required to keep in the oven to evaporate the binder which is added to composite. The composite after evaporation of binder becomes harder than the printed one. It has to be examined for the internal defects. The other pivotal parameter to look into this printed composite specimen possesses better strength and optimising using DL algorithm.

14 Aug 2021

2021105514

Title of the invention: -

Method of synthesising hybrid metal sand composite and 3D Printing thereof optimising
using DL

5 **Field of the invention: -**

The present invention relates to the field of 3D printing and particularly relates to method
of synthesising hybrid metal sand composite and 3D printing using DL algorithm.

10 **Prior art to the invention: -**

1. A patent document with application number "201920262959", titled with "Metal 3D
printing nozzle extrusion device", describes, "The utility model discloses a metal 3D printing
nozzle extrusion device. The device comprises a connecting seat, nozzles are fixedly
15 mounted on the left side of the bottom surface of the connecting seat; vertical rod is
arranged on the right side of the nozzle, the vertical rod and the bottom surface of the
connecting seat are fixedly mounted; the periphery of the lower end of the vertical rod is
sleeved with a round sleeve, the round sleeve and the vertical rod are fixedly installed
through a fixing device, a connecting plate is fixedly installed on the left side of the round
20 sleeve, a first threaded hole is formed in the left side of the top face of the connecting plate,
a screw is arranged in the first threaded hole, and the screw is in threaded fit with the first
threaded hole. Blockage in the nozzle is cleaned in a drill bit drilling mode, the drill bit is
large in hardness and prevented from being broken, the service life of equipment is
prolonged, when the nozzle is used, only the drill bit needs to be rotated to be arranged
25 below the nozzle, and operation is easy and convenient."
2. A patent document with application number "201911041836", titled with "3D printing
method for metal material", describes, the invention belongs to the field of metal 3D
printing and discloses a 3D printing (additive manufacturing) method for a metal material.
By taking stable metal powder slurry prepared by metal powder, an organic solvent, a
30 bonder, a dispersant, a suspending agent and a degassing agent or a solid-liquid mixture
such as a suspension liquid, a dispersion liquid, a complex and a colloid as a forming
material, a metal product which is fine in structure is prepared simply and rapidly by

adopting a novel selective laser melting mode. The 3D printing method comprises the following steps of uniformly mixing metal or alloy powder, the organic solvent, the bonder, the dispersant, the suspending agent and the degassing agent to prepare the metal powder slurry which is stable and good in flowability, wherein a storage tank is connected to a base, a printing platform is connected to a lifting structure and is located right above the storage tank, and a laser light source system is placed below the storage tank; and establishing a printing model by three-dimensional software, and setting laser process parameters for SLM printing. According to the 3D printing method, the powder paving process is reduced, the device is simplified, the printing efficiency is improved, and the metal powder splashing and oxidizing problems are solved".

wherein, the present invention is printing of synthesised hybrid metal sand composite for construction application.

Objects of the invention: -

The primary object of the present invention is the method of synthesising the metal sand composite and 3D printing of it. The secondary object of the present invention is the method of synthesising the weird combination of metal with sand which pave path to novel material development in turn they used for versatile applications like solid rods used for construction and optimising using DL algorithm.

Summary of the invention:

The 3D printing has unique capabilities which are providing the design as well as material freedom. Many new methods are being developed throughout the world due to the versatile options possess by additive manufacturing. One such a new version is developed with simple metal and or its alloys are homogenously mixing with sand as the required strength of the material. The application of it defines the ratio of mixing the metal alloys with sand. If the end component requires more strength the mixing of sand should be less. During synthesisation, need to identify the suitable binder in this case, which plays pivotal

role. The synthesised material should be in suitable state to print, for that simple 3D printing technique is used along with modification of supplying the heat from the printer bed. The post process is carried out after printing it should be coated with a layer of same metal and or metal alloys. It is required to keep in the oven to evaporate the binder which is added to composite. The composite after evaporation of binder become harder than the printed one. It has to be examined for the internal defects. The other pivotal parameter to look into this printed composite specimen possesses better strength. This hybrid combination pave path to newer applications to replace the solid rods used in the construction industries and optimising using DL algorithm.

Brief description of diagram: -

Figure 1 is the schematic representation of Method of synthesising hybrid metal sand composite and 3D Printing thereof for construction application

Detailed description: -

The following specification particularly describes the invention and the manner in which it is to be performed.

5 The 3D printing has unique capabilities which are providing the design as well as material freedom. Many new methods are being developed throughout the world due to the versatile options possess by additive manufacturing. One such a new version is developed with simple metal and or its alloys are homogenously mixing with sand as the required strength of the material. The application of it defines the ratio of mixing the metal alloys with sand. If the end component requires more strength the mixing of sand should be less. 10 During synthesisation, need to identify the suitable binder in this case, which plays pivotal role. The synthesised material should be in suitable state to print, for that simple 3D printing technique is used along with modification of supplying the heat from the printer bed. The post process is carried out after printing it should be coated with a layer of same metal and 15 or metal alloys. It is required to keep in the oven to evaporate the binder which is added to composite. The composite after evaporation of binder become harder than the printed one. It has to be examined for the internal defects. The other pivotal parameter to look into this printed composite specimen possesses better strength. This hybrid combination pave path to newer applications to replace the solid rods used in the construction industries.

20 The embodiment comprises a metal mixture (1) which of metal powder or combination of metals powder (alloys) and sand are added with the effective binder in this case araldite is taken as binder. A transfer unit (2) is fitted to the 3D printer on a printing head (3) wherein the printing of the metal mixture (1) is taken place in the normal deposition method. The 25 model is fed into the printer through the SD card or straight way from the computer via physical wire connection. Thereafter, printing starts as per the input model. Herein, the model chosen for the testing purpose is simple rectangular plate. The method of synthesising the weird combination of metal with sand which pave path to novel material development in turn they used for versatile applications like construction industries and 30 optimising using DL algorithm.

The ratio of the mixture is completely customisable for example let us consider the metal, sand and binder in the ratio of 60:30:10, wherein the initial ratio is obtained.

The embodiment comprises of the metal mixture (1) is mixture of metal alloy, sand and binder therein, it has the transfer unit (2) which is fitted to the 3D printer on a printing head (3) therein, the final product is printed as the printed specimen (4) and a DL kit (5) is used to optimise perfect ratio for synthesis to provide perfect ratio.

Claims: -

1) We claim,

A method of synthesising hybrid metal sand composite and 3D printing thereof optimising using DL: comprises of,

A metal mixture (1);

A transfer unit (2);

A printing head (3);

A printed specimen (4); and

A DL kit (5);

wherein, the metal mixture (1) is mixture of metal alloy, sand and binder therein, it has the transfer unit (2) which is fitted to the 3D printer on a printing head (3) therein, the final product is printed as the printed specimen (4) and a DL kit (5) is used to optimise perfect ratio for synthesis to provide perfect ratio.

2) The method of synthesising hybrid metal sand composite and 3D Printing thereof optimising using DL application as claimed in claim 1, wherein, the method of synthesising the weird combination of metal with sand which pave path to novel material development in turn they used for versatile applications like construction industries to replace the solid rods and optimising using DL algorithm.

Title: - Method of synthesising hybrid metal sand composite and 3D printing thereof optimising using DL

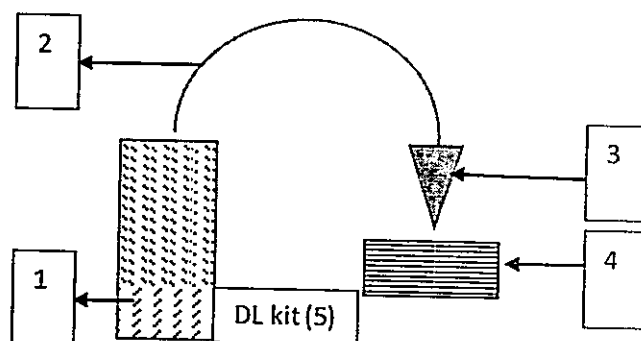


Figure 1

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Applicant details

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2021105514
: Method of synthesising hybrid metal sand composite and 3D Printing thereof optimising using DL

Patentographic data

Application details

Australian application number	2021105514	Patent application type	Innovation
Application status	GRANTED	Paid to date	2023-08-14
Currently under opposition	No	Proceeding type(s)	
Invention title	Method of synthesising hybrid metal sand composite and 3D Printing thereof optimising using DL		
Inventor(s)	R, SENTHILKUMAR; S, PRAKASAM; A, THIRUMOORTHY; K, PRATHIPA; N, KIRTHIGA; S, SABARINATHAN; V, SOUNDARA RAJAN; L, ARUL SHANKAR; E, AJAY KUMAR		
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Filing date	2021-06-14	Australian OPI date	2022-01-13
Effective date of	2021-06-14	Expiry date	2029-06-14

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