I SEMESTER
DSC 1 DESIGN AND ANALYSIS OF ALGORITHM 18PCCS11
Hrs / Week : 6   Hrs / Sem: 90   Hrs / Unit : 18   Credits :4

OBJECTIVES
➢ To analyze the asymptotic performance of algorithms, and demonstrate a familiarity with major algorithms and data structures.
➢ To apply important algorithmic design paradigms and methods of analysis

UNIT I INTRODUCTION
Notion of an Algorithm – Fundamentals of Algorithmic Problem Solving – Important Problem Types – Fundamentals of the Analysis of Algorithm Efficiency – Analysis Framework – Asymptotic Notations and its properties.

UNIT II BRUTE FORCE AND DIVIDE-AND-CONQUER
Brute Force - Closest-Pair and Convex-Hull Problems-Exhaustive Search - Travelling Salesman Problem - Knapsack Problem – Assignmentproblem. Divide and conquer methodology – Merge sort – Quick sort – Binarysearch.

UNIT III DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE
Computing a Binomial Coefficient – Warshall's and Floyd' algorithm – Optimal Binary Search Trees – Knapsack Problem and Memory functions. Greedy Technique– Prim's algorithm- Kruskal's Algorithm-Huffman-Trees.

UNIT IV ITERATIVE IMPROVEMENT
The Simplex Method-The Maximum-Flow Problem – Maximum Matching in Bipartite Graphs- The Stable marriage Problem.

UNIT V COPING WITH THE LIMITATIONS OF ALGORITHM POWER
Limitations of Algorithm Power-Lower-Bound Arguments-Decision Trees- Coping with the Limitations - Backtracking – n-Queens problem – Hamiltonian Circuit Problem –Branch and Bound – Assignment problem – Knapsack Problem – Travelling Salesman Problem.

TEXT BOOK(S):
Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012.

REFERENCE(S):
1. 1.Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction toAlgorithms", Third Edition, PHI Learning Private Limited, 2012.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "Data Structures and Algorithms", Pearson Education, Reprint 2006.
3. 3.Donald E. Knuth, "The Art of Computer Programming", Volumes 1& 3 Pearson Education, 2009. Steven S. Skiena, "The Algorithm Design Manual", Second Edition, Springer, 2008.
4. http://nptel.ac.in/

I SEMESTER		
DSE-1A	CLOUD COMPUTING	18PECS1A
Hrs / Week :4	Hrs / Sem: 60 Hrs / Unit : 12	Credits :4

OBJECTIVES
- To study the Basics of cloud computing and Different Cloud Computing services
- To understand the key concepts of virtualization, Cloud Implementation, Programming and Mobile cloud computing

UNIT-I : UNDERSTANDING CLOUD COMPUTING
Cloudcomputing-cloudtypes-thecloudcubemodel-deploymentmodels-servicemodels-characteristics of cloud computing:Benefits of Cloud Computing-Disadvantages of Cloud Computing-assessing the role of open standards.

UNIT-II : CLOUD ARCHITECTURE
The cloud computing stack – composability – infrastructure – platforms – virtual appliances – communication protocols –Connecting to the cloud: The Jolicloud net book OS – Chromium OS the browser as an operating system.

UNIT-III : DEVELOPING CLOUD SERVICES
Infrastructure as a service (IaaS) – IaaS workloads- Platform as a service (PaaS) – Software as a service (SaaS)– Identity as a service (IDaaS) – Compliance as a service(CaaS).

UNIT-IV : VIRTUALIZATION AND CLOUD APPLICATIONS
Virtualization technologies – load balancing and virtualization – advanced load balancing – the Google cloud – Google Analytics – Google translate- Google Toolkit – Google APIs-Windows Azureservice – Windows Azure App fabric.

UNIT-V : CLOUD STORAGE
Cloud storage – unmanaged cloud storage – managed cloud storage – creating cloud storage systems – working with Amazon storage systems: Amazon Elastic compute cloud(EC2)- Amazon simple storage system(S3) – Amazon Elastic block store(EBS)- cloud front-security issues

TEXT BOOK(S)
Barrie Sosinsky, *Cloud Computing Bible*, New Delhi: Wiley India Pvt. Ltd, 2012.Print Chapters: 1,3,4,5(pgs:94-99),8(pgs:162-173),10(pgs:201-216),15(pgs:316-321),9(pgs:185-199).

REFERENCE BOOK(S)
1. Haley Beard,,*Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing,Applications and Data Centers in the Cloud with SLAs*, Emereo Pvt. Limited,July2008.Print
2. Michael Miller, *Cloud Computing: Web-Based Applications That Change the Way You Work andCollaborate Online*, Second Edition, Que Publishing, August 2008.Print

WEBSITE(S) :
1. www.infoworld.com/d/cloud-computing/
2. http://cecs.wright.edu/~pmateti/Courses/2350/Labs/Cloud/CloudComputing.html
3. https://www.windowsazure.com/en-us/

II SEMESTER		
DSC-5	**ADVANCED DATABASE MANAGEMENT SYSTEM**	**18PCCS22**
Hrs / Week :5	**Hrs / Sem:75** **Hrs / Unit :15**	**Credits :4**

OBJECTIVES

- To present an introduction to database management systems.
- To understand how to organize, maintain and retrieve the information from a DBMS efficiently.

UNIT I RELATIONAL MODEL

Introduction - Structure of Relational Data Base - Relational Algebra. ER Model - Basic Concepts - Conversion of ER Model into Relations - ER Diagram Symbols. EER Model - Subclasses - Entity Types and Superclasses.

UNITII DATA BASE DESIGN

Functional Dependency and Decomposition - Functional Dependency - Decomposition. Normalization - Introduction - Normalization - Normal Forms - BCNF - 4 NF - 5 NF.

UNIT III QUERY PROCESSING AND OPTIMIZATION

Introduction - Query Processing - Syntax Analyzer - Query Decomposition - Query Optimization. Transaction Processing and Concurrency Control: Transaction Concepts - Concurrency Control.

UNITIV DATA BASE RECOVERY AND SECURITY

Introduction –Database Recovery Concepts - Types of Database Failures - Types of DatabaseRecovery - Recovery Techniques - Buffer Management. Goals of Database Security – Discretionary Action Control – Mandatory Access Control – Firewalls – Statistical Database Security – Data Encryption.

UNIT V DATA BASE TECHNOLOGIES

Introduction –Parallel Databases – Architecture of Parallel Databases – Key Elements of Parallel Database Processing - Distributed Data Bases - Architecture of Distributed Data Bases - Distributed Data Base System Design – Recovery Control in Distributed Databases. Internet Databases – Digital Libraries – Multimedia Databases – Mobile Databases – Spatial Databases.

TEXT BOOK(S):

1. S.K. Singh, "Database Systems Concepts, Design and Applications", Pearson Education Pte. Ltd., New Delhi: 2006.
2. C.J. Date and others, "An Introduction to Database Systems", Eighth Edition, Pearson Education Pte. Ltd., New Delhi: 2006.
3. Abraham Silberschatz, "Database Systems", McGraw Hill International, 1997.

REFERENCE(S):

1. Paneerselvam R, "Database management systems", PHI, 2005.
2. Narang Rajesh, "Database management systems", PHI, 2005.
3. ISRD Group, "Introduction to database management systems", TMG, 2006.
4. Ramakrishnan, Gehrke, "Database management systems", 3/E, TMG, 2003.

IV SEMESTER		
DSC 11	SOFT COMPUTING	18PCCS42
Hrs / Week :5	Hrs / Sem:75	Hrs / Unit : 15	Credits :4

OBJECTIVES:

- To introduce a relatively new computing paradigm for creating intelligent machines useful for solving complex real world problems.
- To insight into the tools that make up the soft computing techniques fuzzy logic, artificial neural networks and hybrid systems Techniques.

UNIT I ARTIFICIAL NEURAL NETWORK

Introduction – Neural Networks – Application Scope of Neural Networks – Fundamental Concept – Basic Models of Artificial Neural Network – Important Terminologies of ANNs – Hebb Network – Perceptron Networks – Adaptive Linear Neuron (Adaline) – Multiple Adaptive Linear Neurons – Back-Propagation Network

UNIT II ASSOCIATIVE MEMORY NETWORKS

Introduction – Autoassociative Memory Network - Heteroassociative Memory Network – Bidirectional Associative Memory (BAM) – Hopfield Networks – Unsupervised Learning Networks :Kohonen Self–Organizing Feature Maps – Learning VectorQuantization – CounterPropagation Networks – Adaptive Resonance Theory Network.

UNIT III GENETIC ALGORITHM

Introduction – Biological Background – Basic Terminologies in Genetic Algorithm – Operators in Genetic Algorithm: Encoding – Selection – Crossover (Recombination) – Mutation – Stopping Condition for Genetic Algorithm Flow – Constraints in Genetic Algorithm – Problem Solving Using Genetic Algorithm – Classification of Genetic Algorithm : Messy Genetic Algorithms – Hybrid Genetic Algorithms.

UNIT IV FUZZY LOGIC

Introduction to Fuzzy logic – Classical Sets (Crisp Sets) - Fuzzy Sets – Classical Relations and Fuzzy Relations : Introduction – Cartesian Product of Relation – Classical Relation – FuzzyRelations – Features of the Membership Functions – Fuzzification – Methods of Membership Value Assignments

UNIT V DEFUZZIFICATION AND DECISION MAKING

Defuzzification : Introduction – Lambda-Cuts for Fuzzy Sets(Alpha-Cuts) - – Lambda-Cuts for Fuzzy Relations – Defuzzification Methods – Fuzzy Decision Making : Introduction – Individual Decision Making – Multiperson Decision Making – Multiobjective Decision Making – Multiattribute Decision Making – Fuzzy Bayesian Decision Making

TEXT BOOK(S):

1. S.N Sivanandam S.N Deepa "Principles of Soft Computing", Wiley –India, 2007.
2. Timothy J.Ross,"Fuzzy Logic with Engineering Application ", McGraw Hill, 2000.

REFERENCE(S):

1. S.RajasekaranG.A.Vijayalakshmi Pai "Neural networks, Fuzzy logic, and Genetic algorithm" , synthesis and Applications
2. James A. Freeman, David M. Skapura, Neural Networks, Algorithms, Applications, and Programming Techniques.

IDC SUBJECTS OFFERED BY DEPARTMENT OF COMPUTER SCIENCE TO OTHER MAJOR STUDENTS

II SEMESTER			
IDC-1	**INTERNET CONCEPTS AND WEB DESIGN**		**18PICS21**
Hrs/Week: 3	**Hrs/Sem: 45**	**Hrs/Unit: 9**	**Credits:3**

OBJECTIVES
- To understand about Internet Tools and E-Mail structure.
- To develop web pages using HTML.

UNIT-I : THE INTERNET

Introduction – Evolution of Internet – Basic Internet Terms – Website – Browser-URL – ISP – Webserver – Download and Upload – Online and Offline - Getting Connected to Internet – Internet Applications.

UNIT-II : INTERNET TOOLS

Introduction – Web Browser – Browsing Internet UsingIE – E-mail – E-mail Address Structure – Checking E-mails – Sending E-mails – E-mail Attachments – How E-mail Works - Netiquette - Search Engines Instant Messaging.

UNIT-III :HISTORY OF HTML

History of HTML-HTML document-HEAD and BODY sections-Title, Prologue,Links-Comment line-Designing the BODY section-Aligning the headings-HR tag-Paragraphs-Tab settings-Images and Pictures-Embedding PNG format images.

UNIT-IV :ORDERED AND UN ORDERED LISTS

Ordered and Un Ordered lists-Nested Lists-Headings in a list-Table Handling-Table Creation in HTML-Width of the table and Cells-Cell spanning-Coloring cells-column specification.

UNIT-V :FRAMES

Frames - Frameset definitions-Framedefinitions- Nested Framesets-Forms-Action attribute-Method attribute-Enctype attribute-Check Boxes- Radio Buttons - Text Fields - Text Areas – Password-Submit and Reset buttons-Drop down list-sample forms.

TEXT BOOK(S):
1. Introduction to Information Technology,ITL Education SolutionsLimitedPearson Education
   Unit I – Chapter 15
   Unit II – Chapter 16
2. World Wide Web with HTML, Dr.C.Xavier., Tata McGraw – Hill Publishing Company.

III SEMESTER		
DSC 9	DIGITAL IMAGE PROCESSING	18PCCS33
Hrs / Week :5	Hrs / Sem:75 Hrs / Unit : 15	Credits :4

OBJECTIVES
- To learn and understand the fundamentals of digital image processing, and various image Transforms.
- To learn Image Enhancement Techniques, Image restoration Techniques, image compression and Segmentation used in digital image processing.

UNIT I INTRODUCTION TO IMAGE PROCESSING

Digital Image Processing – Mat Lab Working Environment – Image Representation – reading images – Displaying images – Writing images – Data classes – Image types – Converting between data classes and image types – Array indexing – M-Function Programming

UNIT II SPATIAL DOMAIN AND FREQUENCY DOMAIN PROCESSING

Intensity Transformation functions – Histogram processing and function plotting – spatial filtering – 2-D Discrete Fourier transformation – filtering in the frequency domain – generating and sharpening frequency domain filters

UNIT III IMAGE RESTORATION AND COLOR IMAGE PROCESSING

Model of the image degradation / restoration process – Noise models – Periodic Noise Reduction using frequency domain filtering – direct inverse filtering – wiener filtering – constrained least square filtering – Lucy – Richardson algorithm – color image representation

UNIT IV IMAGE COMPRESSION AND MORPHOLOGICAL IMAGE PROCESSING

Coding redundancy - Spatial redundancy – psycho visual redundancy – JPEG compression - Morphological image processing – dilation and erosion – morphological reconstruction

UNIT V IMAGE SEGMENTATION AND REPRESENTATION

Point , Line, Edge Detection – Hough Transform – Thresholding – Region based Segmentation – Watershed Transform – Representation – Boundary Descriptors – Regional Descriptors.

TEXT BOOK(S):
1. Rafael C.Gonzalez, Richard E. Woods, Steven L. Eddins, Digital Image Processing using MATLAB, Pearson Education Inc, New Delhi, 2007.

REFERENCE(S):
1. Chanda. B. Dutta Majumder, D. Digigal Image Processing and Analysis, Prentice Hall of India, New Delhi, 2007.
2. Gonzalez, R.C., Wintz P Digital Image Processing, Addison-wesley Longman Publishing Co, New Delhi – 1987
3. Scott E. Umbaug, Computer Vision and Image Processing, Prentice Hall International, New Delhi, 1998.

SADAKATHULLAH APPA COLLEGE (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE
M.Phil Computer Science

METRICS – 1.1.2 & 1.2.2

TITLE OF THE PAPERS

M. PHIL. COMPUTER SCIENCE (2018 - 2021)

(The candidate should select any one of the Area Papers in the second semester related to their proposed topics of research)

SEM	P	TITLE OF THE PAPER	SUB. CODE	TOTAL PERCENTAGE	LINK
I	DSC1	Research and Teaching Methodology	18MCCS11	60%	Research Document
	DSC2	Machine Learning Techniques	18MCCS12	100%	
	DSE	A) Virtual Reality	18MECS1A	100%	
		B) Digital Image Processing	18MECS1B	-Nil-	
		C)Deep Learning	18MECS1C	100%	
		D) Big Data Analytics	18MECS1D	100%	
II	D	Project and Viva-voce	18MDCS21	-Nil-	
TOTAL				460	

Number of courses in M.Phil Programme = 7

Weightage of the courses = 100

Total (7 * 100) = 700

Percentage of content replaced (or) added = 460

Percentage of Changes in courses =

(460 / 700 * 100) | 65.71% |

I SEMESTER

DSC1	RESEARCH AND TEACHING METHODOLOGY	18MCCS11

Hrs/Week: 4	Hrs/ Sem: 60	Hrs/Unit: 15	Credits: 4

OBJECTIVES:

- To develop understanding of the basic framework of research process.
- To develop an understanding of various research designs and techniques.
- To identify various sources of information for literature review and data collection.
- To develop an understanding of the ethical dimensions of conducting applied research.
- Appreciate the components of scholarly writing and evaluate its quality.

UNIT I INTRODUCTION TO RESEARCH

Meaning of Research – Objectives of Research – Motivation in Research – Types of Research – Research Approaches – Significance of Research – Research Methods versus Methodology – Research and Scientific Method – Importance of knowing how research is done – Research Process – Criteria of Good Research – Defining the Research Problem – Selecting the Problem – Necessity – Techniques involved in defining a problem – Research Design – Meaning – #Need# – Features of Good Design.

Unit II Data Collection and analysis:

Execution of the research - Observation and Collection of data - Methods of data collection – Sampling Methods- Data Processing and Analysis strategies - Data Analysis with Statistical Packages - Hypothesis-testing - Generalization and Interpretation. RESEARCH TOOLS Introduction – SPSS – MATLAB – LaTeX –#Weka# # .... # self-study portion

Unit III Reporting and thesis writing

Structure and components of scientific reports - Types of report – Technical reports and thesis – Significance – Different steps in the preparation – Layout, structure and Language of typical reports – Illustrations and tables - Bibliography, referencing and footnotes - Oral presentation – Planning – Preparation – Practice – Making presentation – Use of visual aids - Importance of effective communication –. Interpretation of Data and Paper Writing – Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals.

Unit IV Application of results and ethics –

Environmental impacts - Ethical issues - ethical committees - Commercialisation – Copy right – royalty - Intellectual property rights and patent law – Trade Related aspects of Intellectual Property Rights – Reproduction of published material – Plagiarism - Citation and acknowledgement - Reproducibility and accountability.

UNIT V Methodology of Teaching

Teaching –Objective of Teaching-Phases of Teaching-Teaching Methods: Lecture Methods-Discussion Methods-Discovery Learning-Inquiry, Problem Solving Methods-Project Method-Seminar-Integrating ICT in Teaching-Individualised Instruction, Ways for Effective Presentation with Power Point-Documentation-Evaluation: Formative-Summative-Continuous and Comprehensive Evaluation-Later Adolescents Psychology: Meaning Physical, Cognitive, Emotional, Social and Moral Development-Teaching Later Adolescents.

COURSE OUTCOMES:

- Understand some basic concepts of research and its methodology
- Identify appropriate research topics
- Select and define appropriate research problem parameter
- Overview & concepts of research
- The need for research and types of research
- Steps in conducting research, prepare a project proposal
- Organize and conduct research in a more appropriate manner
- Write a research report, thesis and research proposal

REFERENCES

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.

2. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International. 418p.

3. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, Ess Ess Publications. 2 volumes.

4. Trochim, W.M.K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing. 270p.

5. Wadehra, B.L. 2000. Law relating to patents, trade marks, copyright designs and geographical indications. Universal Law Publishing.

6. Sampath K, Paneerselvam A & Santhanam S (1984) Introduction to educational technology, (2nd revised ed.), Sterling Publishers, New Delhi.

7. Sharma S R (22003) Effective class room teaching modern methods, tools & Techniques, Mangal Deep, Jaipur.

8. Vedanayagam E G (1989) Teaching methodology for College Teachers, Sterling Publishers, New Delhi.

Additional Reading

1. Anthony, M., Graziano, A.M. and Raulin, M.L., 2009. Research Methods: A Process of Inquiry, Allyn and Bacon.

2. Carlos, C.M., 2000. Intellectual property rights, the WTO and developing countries: the TRIPS agreement and policy options. Zed Books, New York.

3. Coley, S.M. and Scheinberg, C. A., 1990, "Proposal Writing", Sage Publications.

4. Day, R.A., 1992.How to Write and Publish a Scientific Paper, Cambridge University Press.

5. Fink, A., 2009. Conducting Research Literature Reviews: From the Internet to Paper. Sage Publications

6. Leedy, P.D. and Ormrod, J.E., 2004 Practical Research: Planning and Design, Prentice Hall.

7. Satarkar, S.V., 2000. Intellectual property rights and Copy right. Ess Ess Publications.