Pre- PhD (Computer Science) Syllabus
W.E.F Academic year 2021-22
[Regulation: R-21]

Mandatory Course:

S.No	Course Code	Course Title
1	PPCS 101	Research Methodology in Computer Science

List of Specilized Subjects:
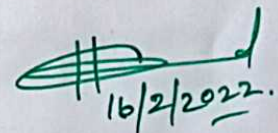
S.No	Course Code	Course Title
1	PPCS111	Real Time systems
2	PPCS112	Mobile computing

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16/2/2022.

PPCS101

Research Methodology In Computer Science

Credits:3

Instruction: (3L)hrs per week

Duration of SEE: 3 hours
SEE: 100 marks

Course Objectives:
1. Understand research problem formulation • Design experiments
2. Analyze research related information
3. Write papers and thesis

Course Outcomes: After Completion of the course Students will be able to:
1. Understand the research process
2. Solve unfamiliar problems using scientific procedures
3. Pursue ethical research
4. Use appropriate tools for documentation and analysis of data

UNIT-I

Research Process: Meaning of Research, Objectives and Motivation of Research, Technological Innovation, Types of Research, Research Vs Scientific method, Research Methodology vs Research Methods, Research process.

Research Problem Formulation: Problem solving in Engineering, Identification of Research Topic, Problem Definition, Literature Survey, Literature Review.

Research Design: Research Design: What it is?, Why we need Research Design? Terminology and Basic Concepts, Different Research Designs, Experimental Designs, Important Experimental Designs, Design of Experimental Setup, Use of Standards and Codes.
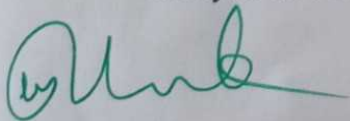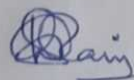
UNIT-II

Mathematical Modeling: Models in General, Mathematical Model, Model Classification, Modeling of Engineering Systems.
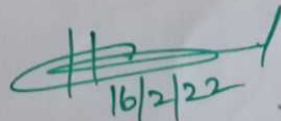
Probability and Distributions: Importance of Statistics to Researchers, Probability Concepts, Probability Distributions, Popular Probability Distributions, Sampling Distributions.
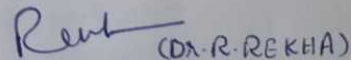
Sample Design And Sampling: Sample design, Types of sample designs, The Standard Error, Sample Size for Experiments, Prior Determination Approach, Use of Automatic Stopping Rule.

Hypothesis Testing And ANOVA: Formulation of Hypothesis, Testing of Hypothesis, Analysis of Variance.
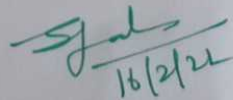
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UNIT-III

Design of Experiments and Regression Analysis: Design of Experiments, Planning of Experiments, Multivariate Analysis, Simple Regression and Correlation, Multiple Regression and Correlation

Analysis and Interpretation of Data: Introduction, Data Checking, Data Analysis, Interpretation of Results, Guidelines in Interpretations.

Accuracy, Precision and Error Analysis: Introduction, Repeatability and Reproducibility, Error Definition and Classification, Analysis of Errors, Statistical Analysis of Errors, Identification of Limitations

UNIT-IV

Writing of Papers and Synopsis: Introduction, Audience Analysis, Preparing Papers for Journals, Preparation of Synopsis of Research Work

Thesis Writing Mechanics: Introduction, Audience for Thesis Report, Steps in Writing the report, Mechanics of Writing, Presentation of graphs, figures and tables.

Structure of Thesis Report: Suggested Framework of the Report, Preliminary Pages, Main Body of Thesis, Summary, Appendices, References, Glossary.

UNIT-V:

Ethics in Research: Importance of Ethics in Research, Integrity in Research, Scientific Misconduct and Consequences.

Spreadsheet tool: Introduction, Quantitative Data Analysis Tools, Entering and preparing your data, Using statistical functions, Loading and using Data Analysis Tool Pack *[Tools: Microsoft Excel/ Open office]*

Thesis writing & Scientific editing tool. [Tool: Latex]: Introduction, Document Structure, Type setting Text, Tables, Figures, Equations, Inserting References

SuggestedReadings :

1. R.Ganesan; Research Methodology for Engineers; MJP Publishers; Chennai, 2011.
2. Paul RCohen. Empirical Methods in AI.PHI, New Delhi, 2004
3. C.R.Kothari, Research Methodology, Methods & Technique; New age International Publishers, 2004
4. Kumar, Ranjit. Research Methodology-AStep-by-Step Guide for Beginners, (2nd.ed), Singapore, Pearson Education, 2005
5. https://arxiv.org/pdf/physics/0601009.pdf
6. https://pdfs.semanticscholar.org/e1fa/ec8846289113fdeb840ff3f32d102e46fbff.pdf
7. LaTEX for Beginners, Workbook, Edition5, March2014.
8. Chapter13, An introduction to using Microsoft Excel for quantitative data analysis: Management Research: Applying the Principles © 2015 Susan Rose, Nigel Spinks & Ana Isabel Canhoto.

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PPCS111

REAL TIME SYSTEMS
Credits:3

Instruction: 3L hrs per week

Duration of SEE : 3 hours

SEE:100 Marks

Course Objectives:
1. Develop an understanding of various Real Time systems Application
2. Obtain a broad understanding of the technologies and applications for the emerging and exciting domain of real-time systems
3. Get in-depth hands-on experience in designing and developing a real operational system.

Course Outcomes: After Completion of the course Students will be able to:
1. Explain concepts of Real-Time systems and modeling.
2. Recognize the characteristics of a real-time system.
3. Understand and develop document on an architectural design of a real-time system.
4. Develop and document Task scheduling, resource management, real-time operating systems and fault tolerant applications of Real-Time Systems.

UNIT-I

Introduction: Definition, Applications and Types of Real Time Systems, Typical Case Studies of Real Time Systems, Time Constraints.

A Reference Model for Real Time Systems: Processors and Resources, Periodic Task Model, Precedence and Data Dependency, Temporal, Foundational and Resource Parameters, Scheduling Hierarchy.

UNIT-II

Real Time Scheduling: Different Approaches- Clock Driven, Priority Driven, Scheduling of Periodic and Sporadic Jobsin Priority-Driven Systems.

UNIT-III

Resource Management Resources and Resource Access Control, Critical Section, Priority-Ceiling Protocols, concurrent Access to Data Objects.

UNIT-IV

Implementation Aspects: Timing Services and Scheduling Mechanisms, Other Basic Operating System Functions, Processor Reserves and Resource Kernel, Open System Architecture, Capabilities of Commercial Real Time Operating Systems, Predictability of General Purpose Operating Systems.

UNIT-V

Case Studies: Vx –Works, and RTLinux.
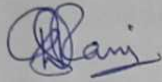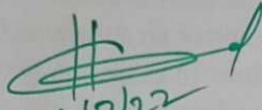
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Suggested Reading:

1. Jane W.S.Liu, *Real Time Systems*, Pearson Education,2001.
2. C.M.Krishna and Kang G.Shin, *Real Time Systems*,Mc-Graw Hill Companies Inc.,1997.
3. Raymond J.A.Buhr, Donald L. Bailey, *An Introduction to Real Time Systems*, Prentice Hall International, 1999.
4. K.V.K.K.Prasad, *Embedded Real Time Systems, Concepts, Design and Programming*, Dreamtech Press, 2003.

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PPCS 112

Mobile Computing
Credits : 3

Instruction:: 3L hrs per week

Duration of SEE 3 hours
SEE :100 marks

Course Objectives:
1. To learn the basics of wireless voice and data communication technologies.
2. To build working knowledge on various telephone and satellite networks.
3. To study the working principles of wireless LANs and standards.
4. To study principles of adhoc networks and routing.
5. To gain knowledge on integration of mobile networks into Internet.
6. To build skills in working with wireless application protocols to develop mobile applications.

Course Out comes: After Completion of the course Students will be able to:
1. Understand about Adhoc Network Routing protocols.
2. Implement and learn about tracking, localization and routing in wireless networks.
3. Implement file transfer, access and authentication-based applications for mobile computing.
4. Explain the structure and components for Mobile IP and Mobility Management.
5. Design and implement mobile applications to realize location-aware computing.

UNIT-I

Introduction: Wireless Transmission, Frequencies for Radio Transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulations, Spread Spectrum, MAC, SOMA, FDMA, TDMA, CDMA, Cellular Wireless Networks.

UNIT-II

Telecommunication Systems: GSM, GPRS, Satellite Networks, Basics, Parameters and Configurations, Capacity Allocation, FAMA and DAMA, Broadcast Systems, DAB, DVB, CDMAand 3G.

UNIT-III

Wireless LAN: IEEE 802.11 Architecture, Services, MAC – Physical Layer, IEEE 802.11a – 802.11bstandards, Bluetooth.

UNIT-IV

Routing Ad-hoc Network Routing Protocols: Ad-hoc Network Routing Protocols, Destination Sequenced Distance Vector Algorithm, Cluster Based Gateway Switch Routing, Global State Routing, Fish-eye state Routing, Dynamic Source Routing, Ad-hoc on-demand Routing, Location Aided Routing, Zonal Routing Algorithm.

MobileIP- Dynamic Host Configuration Protocol.

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Traditional TCP- Classical TCP Improvements –WAP, WAP2.0.
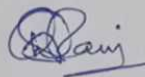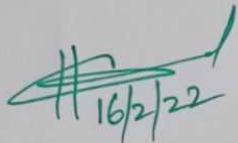
UNIT-V

Publishing & Accessing Data in Air: Pull and Push Based Data Delivery models, Data Dissemination by Broadcast, Broadcast Disks, DirectoryServicein Air, Energy Efficient Indexing scheme for Push Based Data Delivery.

File System Support for Mobility: Distributed File Sharing for Mobility support, Coda and other Storage Manager for Mobility Support.

Mobile Transaction and Commerce: Models for Mobile Transaction, Kangaroo and Joey transactions, Team Transaction, Recovery Model for Mobile Transactions, Electronic Payment and Protocols for Mobile Commerce.

SuggestedReading:

1. Jochen Schiller, *Mobile Communications*, Pearson Education,2^nd^Edition,2009.
2. Kurnkum Garg, *Mobile Computing*, Pearson Education,2010
3. AsokeK Talukder, RoopaR Yavagal, *Mobile Computing*, TMH2008.
4. RajKamal, *Mobile Computing*, Oxford,2009.
5. *"A Survey of Mobile Transactions appeared in Distributed and Parallel databases"* 16,193-230, 2004, Kluwer Academics Publishers.
6. S.Acharya, M.Franklinand S.Zdonil, *"Balancing Push and Pull for Data Broadcast, Proceedings of the ACMSIGMOD"*, Tuscon,AZ, May 1997.
7. S.Acharya, R. Alonso, M.Franklin and S.Zdonik, *"Broadcast Disks: Data Management for Assymetric Communication Environments, Proceedings of the ACM SIGMOD Conference"*, San Jose, CA, May 1995.

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CH. Guddu

Code No:

FACULTY of Engineering and Technology
Pre- PhD – Computer Science Examinations, Jun/jul, 2022

PAPER: Max Marks: 100
Time: 3 Hours

Note: Answer all Questions in Part A & Part B

Part – A (5 X 5 =25 Marks)

(Short Answer Type)

1.
2.
3.
4.
5.

Part – B (5 X 15 =75 Marks)
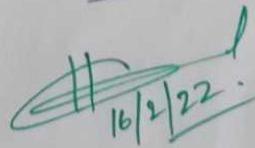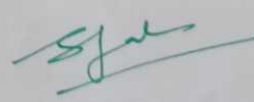
(Essay Answer Type)

6.(a)
      OR
 (b)

7.(a)
      OR
 (b)

8.(a)
      OR
 (b)

9.(a)
      OR
 (b)

10.(a)
      OR
 (b)

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Minutes of BoS Meeting conducted on 28/01/2022, online mode using Google meet for Pre-PhD syllabus and model question paper of PhD - computer science under faculty of Enggi and Technology - Dept. of computer science and Informatics, UCET. MGU. Nalgonda.

1. It is resolved to approve the Pre-PhD syllabus - computer science, encluding specialized subjects for the A.Y. 2021-22; Regulation - R-21.

It is resolved to approve the Model Question paper for Pre-PhD - computer science.

Members present:

1. Dr. R Rekha   chairPerson

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2. Dr. M.A. Hameed   Member

3. Prof Venkat Das

4. Dr. K. Shyamala   16/2/22

5. Dr. M. Chandra Mohan

6. CH. Sudha Rani — member, convenr, CH. Sudelur

7. D. Sandhya Rani