# ST. JOSEPH'S COLLEGE OF ARTS & SCIENCE

# (AUTONOMOUS)

# CUDDALORE-1



# PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

## M.Phil. (Computer Science)

## SYLLABUS 2016 – 2017

# M.PHIL COMPUTER SCIENCE (TEMPLATE)

| Yr/ Semester | Subject | Code | Part | Subject Title | Hours | Credits |
|---|---|---|---|---|---|---|
| I YEAR/I SEM | CORE | MCS101 | I | RESEARCH METHODOLOGY | 6 | 5 |
| | CORE | MCS102B | II | ADVANCED COMPUTER TECHNIQUES | 6 | 5 |
| | CORE | | III | ELECTIVE PAPER (Guide Paper) | 6 | 5 |
| | LIBRARY | | IV | SCIENCE-6 (LIBRARY)+6(LAB) | 12 | |
| | | | | **TOTAL** | **30** | **15** |
| II SEM | CORE | | II | DISSERTATION AND VIVA VOICE | 19 | |
| | | | | PAPER PUBLICATION | 2 | |
| | | | | **GRAND TOTAL** | | **36** |

# RESEARCH METHODOLOGY

## SUBJECT CODE: MCS101

### UNIT – I : RESEARCH METHODOLOGY

Meaning of research objectives of research motivation of research types, approaches and significance methods versus methodology – Research in scientific methods – Research process– Criteria for good research – Problem encountered by research in India – funding agencies.

### UNIT – II : RESEARCH DESIGN

Research problem: Selecting the problem – Necessity of defining the problem – Techniques involved in defining the problem – Research design – Needs and features of good design – Different research design – Basic principles of experimental designs.

### UNIT – III : DATA COLLECTION AND DOCUMENTATION

Data collection methods – Data types – Processing and presentation of data – Techniques of ordering data – Meaning of primary and secondary data – The uses of computers in research – The library and internet – uses of search engines – Virtual libraries – common software for documentation and presentation.

### UNIT – IV : DATA AND ERROR ANALYSIS

Statistical analysis of data – standard deviation – correlation – comparison of sets of data – Chi squared analysis for data – Characteristics of probability distribution – Binomial, Poisson and normal distribution – Principle of least square fittings – curve fittings – measurement of errors – Types and sources of errors – types and sources of errors – Determination and control of errors.

### UNIT – V : RESEARCH COMMUNICATION

Meaning of research report – Logical format for writing thesis and paper – Essential of scientific report abstract, introduction review of literature, materials and methods and discussion – write up steps in drafting report – effective illustrations, tables and figures – Reference styles: Harvard and Vancouver Systems.

**REFERENCE BOOKS:**

1. Research Methodology, Methods and Techniques – CR Kothari – WiswhaPrakasam Publications, II Edition.

2. Research An Introduction – Robert Ross – Harper and Row Publications.

3. Research Mehtodology – P. Saravanavel – Kitiab Mahal, Sixth Edition.

4. Abi handbook for methodology of Research – P. Jammai P.A. Devadoss – Vidhayala Press.

5. Introduction to computers – N. Subramanium.

6. Statistical methods – G.W. Snedecor and W. Cocharaco – Oxford and IBH, New Delihi.

7. Research Methodology, Methods and Statistical Techniques – Samosh Gupta.

8. Statistical Methods – G.P. Gupta.

9. Scientific Social Surveys and Research – P. Young Asia pubishers, Bombay,

10. How to write and publish scientific paper – R.V. Day Cambridge university press Thesis and Assignment Writing – Anderson – Whey Eastern Ltd.

# ADVANCED COMPUTER TECHNIQUES
## SUBJECT CODE: MCS102B

**UNIT – I        ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS**

Definition - Introduction - AI techniques – Heuristic Search Techniques – A* Algorithm – AO* Algorithm - Components of an Expert System - Knowledge Representation and Acquisition Techniques - Building an expert system.

**UNIT – II       FUZZY SYSTEMS**

Definition of a Fuzzy set, Fuzzy Relations, Fuzzy Functions, Fuzzy Measures, Fuzzy Reasoning, and Applications of Fuzzy Systems.

**UNIT – III      DIGITAL IMAGE FUNDAMENTALS AND IMAGE PROCESSING**

Introduction – Fundamental steps in Digital Image Processing – Components of an Image Processing System –Basic relationships between pixels – Basic Gray Level Transformation – Histogram Processing.   Color Fundamentals – Color Models – Color Transformations – Smoothing and Sharpening – Color Segmentation.

**UNIT – IV      NEURAL NETWORKS AND PARALLEL COMPUTING**

Neural Networks – Perceptron Model – Linear separability and XOR problem – 2 or 3 layered neural nets – Back Propagation – Convergence – Hopfield nets – Current Trends and technologies – Parallel Computing – PVM – MPI – Libraries and Calls.

**UNIT – V       PAPER PRESENTATION**

At least one paper should be published in National and International Conferences.

**UNIT – I & II BOOKS FOR STUDY / REFERENCES**

1. Nils J. Nilsson – "**Principles of Artificial Intelligence**" – Narosa Publishing House.
2. Elaine Rich, Kevin Knight – **Artificial Intelligence** – 2nd Edition – TMG.
3. George J. Klir, Tina A. Folger – **Fuzzy sets, Uncertainty and Information** – PHI
4. S. Ramani, R. Chandrasekar and K. S. R. Anjaneyulu – **Knowledge based Computer Systems** – Narosa Publishing House.
5. Doanald A Waterman – **A Guide to Expert Systems** – Addison Wesley.

**UNIT – III BOOKS FOR STUDY / REFERENCES**

1. R. Gonzalez and R. E. Wood – **Digital Image Processing** – Prentice Hall of India, New Delhi, 2002.
2. A. Rosenfeld and A. C. Kak – **Digital Picture Processing** - Prentice Hall of India, New Delhi, 1982.
3. W. K. Pratt – **Digital Image Processing** – MC Graw Hill, New Delhi, 1981.

**UNIT – IV BOOKS FOR STUDY / REFERENCES**

1. Raul Rojas – **Neural Networks: A Systematic Introduction**- Springer- 2013
2. AnanthGrama – **Introduction to parallel computing** – Second Edition – Pearson Edition  - 2003

**UNIT – V BOOKS FOR STUDY / REFERENCES**

1. E – Books
2. National and International Journals.