Education to Eternity

Jaidev Education Society's

J D COLLEGE OF ENGINEERING & MANAGEMENT

(An Autonomous Institute)

NAAC "A" Grade

NAGPUR – 441501

Affiliated to

Dr. Babasaheb Ambedkar Technological University of Maharashtra

SCHEME & SYLLABUS OF COURSE WORK

FOR

DOCTOR OF PHILOSOPHY

(Session 2019-2020)

Ph.D. CELL

J D COLLEGE OF ENGINEERING & MANAGEMENT

NAAC "A" Grade

Scheme for Ph.D. Course Work

The Course work is mandatory as per University Grant Commission (UGC) and Dr. Babasaheb Ambedkar Technological University (DBATU) guidelines. The Course work credits are mentioned under clause 11 of Notification -1 of 2019 of JDCOEM for PhD admission. The details of course work have been mentioned in the following table.

Credit distribution under PhD course work

Semester	Subject Code	Name of Subject	Credits	Examination Scheme			No. of Hours
				End Semester Exam	Continuous Assessment*	Total Marks	
1st Semester	PhD 101A	Research Methodology 1	3	60	40	100	30
	PhD 101B	Research Methodology 2 (Computer Applications)	3				30
	PhD 102	Review of Literature	2		50	50	20
2nd Semester	PhD 103A	Theory Course (decided by respective RAC)	3	60	40	100	30
	PhD 103B	Theory Course Mathematics	3	60	40	100	30
	PhD 104	Seminar & Comprehensive Viva-Voce	2	50	0	50	20
Total Credits & Marks			16 **(Total Credits)**	400 **(Total Marks)**			160

Detailed guidelines are attached in "**Annexure A"**

Annexure A

1 General guidelines for Ph.D. Course work

1.1 The Course work for Ph. D. will be of two semesters and total 16 credits weightage.

1.2 Each Research Scholar admitted to the Ph.D. degree programme shall be required to complete the course work within a period of two semesters.

1.3 It is compulsory to earn 16 credits for successful completion of the course work.

2 Research Methodology I and II (PhD 101 A & B)

Research Methodology paper I and II carry 6 credits.

2.1 Completion of both the courses and successful in End semester examination as per scheme - 60 Marks

2.2 Continuous Assessment includes

2.2.1 Attending workshop on Research Methodology : 4 Marks

2.2.2 Research Methodology paper I - Two Assignments and one power point presentation - 18 Marks

2.2.3 Research Methodology paper II - Two Assignments and one power point presentation - 18 Marks

2.3 End semester examination passing (Online/Offline Mode) : 60 Marks

(**Note - Passing percentage is 50%)**

3 Literature Review (PhD 102)

Literature Review shall be executed during the Ph. D. Course work carrying 50 Marks. The process to be followed is as follows:

3.1 To conduct exhaustive literature review of minimum 30 Research papers (of year 2017 to 2020) and submit the report in the prescribe format: 25 Marks.

3.2 At the end of 1st semester, every Research Scholar has to submit/publish one Review Paper in SCI/ESCI/Scopus Journal: 25 Marks.

4 Theory Course decided by Departmental RAC (Ph.D. 103A)

Theory Course will be based on the topic of research of the candidate suggested by departmental RAC. This course can be taught online / offline, through online courses (ex. SWAYAM, NPTEL), through PG Courses.

4.1 Two Assignments, one power point presentation submission : 40 Marks

4.2 End semester examination passing: 60 Marks

5 Mathematics (Ph.D. 103B)

5.1 Two Assignments, one power point presentation submission : 40 Marks

5.2 End semester examination passing: 60 Marks

6 Seminar and Comprehensive Viva-Voce (PhD 104)

Seminar and Comprehensive Viva-Voce shall be executed during the Ph. D. work.

6.1 Work carried out during the session and Progress report submission: 20 Marks

6.2 Seminars/presentations given on the main topic of Research in front of RAC: 15 Marks

6.3 Viva-voce given on main topic of Research in front of RAC: 15 Marks.

After completion of the course work, RAC will submit the certificate of completion of course work to the university in the prescribed format:

J D College of Engineering and Management

Certificate **Date**

This is to certify that Mr/Ms/Mrs_____ has been a regular student of Ph.D. with registration number _____. He/She has attended the course work conducted at _____ from ..... to ..... during the year ..... He/She has successfully completed the Ph.D. course work prescribed by J D college of Engineering and Management.

Guide BOS Chairman HOD Principal

PAPER-I: PhD-101A RESEARCH METHODOLOGY 1 3 Credits

Unit 1: Introduction to Research Methodology

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 and Criteria of Good Research. Defining the Research Problem: Selecting the Problem, Necessity of Defining the Problem and Technique Involved in Defining a Problem.

Unit 2: Research Design

Need for Research Design, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs: Exploratory research, Descriptive research, diagnostic research, Basic principles of experimental Design and Important Experimental Designs.

Unit 3: Sampling Design, Measurement and Scaling Techniques

Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design, Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs, How to Select a Random Sample, Random Sample from an Infinite Universe, Complex Random Sampling Designs. Measurement in Research, Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling, Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques.

Unit 4: Methods of Data Collection

Collection of Primary Data, Observation Method, Interview Method, Collection of Data through Questionnaires, Collection of Data through Schedules, Difference between Questionnaires and Schedules, Some Other Methods of Data Collection, Collection of Secondary Data, Selection of Appropriate Method for Data Collection and Case Study Method.

Unit 5: Simulation in Research

Meaning of Simulation, Need of Simulation, Appropriateness of Simulation, Advantages and Disadvantages of Simulation, Areas of Application, Simulation of Queueing Systems, Simulation of Inventory Systems, Concepts in Discrete-Event Simulation:·The Event Scheduling/Time Advance Algorithm, World Views and Manual Simulation Using Event Scheduling.

References

[1] C. R. Kothari, Research Methodology: Methods and Techniques, Second Revised Edition, New Age International Publication, 2004.

[2] J. Banks, J. C. Carson II, B. L. Nelson, D. M. Nicol, Discrete Event System Simulation, Fourth Edition, Prentice Hall of India Publication, 2006.

[3] K. N. Krishanaswamy, Appa lyer Sivakumar, M. Mathiranjan, Management Research Methodology: Integration of Principles, Methods and Techniques, Pearson Education, New Delhi, 2006.

PAPER-II: PhD-101B COMPUTER APPLICATIONS 3 Credits

Unit 1: MS WORD

File handing in window, MS-Word: Text formatting, Mail Merge, Macros. Features and applications related to presentation of text in suitable format and saving the data for future applications. Practical knowledge of MS Word to type the script, insert tables, figures and graphs to prepare thesis and research papers in presentable format.

Unit 2: MS EXCEL

Features, Various formulas and functions. Construction of spread sheets from the experimental data. Design and application of formulae for calculations and their applications to the experimental data. Use of statistical tools, graphs, histograms, charts and diagrams.

Unit 3: MS POWER POINT

Creating presentation, Adding Effects, Preparation of power point presentations based on the topic of research. Insertion of figures, graphs, charts in presentation. Preparation of scientific posters for presentations. Use of various presentation techniques.

Unit 4: DOCUMENTATION USING LATEX

Introduction, Document Classes and packages, Document Formatting, Graphics and Tables, Presentation and Bibliography Generation, Vector Imaging Tools, Plotting Tools and Graph Generation.

Unit 5: STUDY OF SIMULATION AND DATA ANALYSIS TOOLS

MATLAB, ProE, ANSYS, IDEA, SPSS, NS-2, QUALNET, NCTUNS, CADENCE, XILINGS, TANNER, CLEMENTINE, PRISM, Drug and Formulation Design Tool, MATCAD, R-Statistics.

Note: Study of any one tool from the above mentioned list in the relevant area is compulsory.

References

[1] Microsoft Office Word 2007: Complete Concepts and Techniques by Gary B. Shelly, Thomas J. Cashman, Misty E. Vermaat, Cengage Learining Inc.

[2] How to Do Everything with Microsoft Office Excel 2007 by Guy Hart-Davis, McGraw Hill.

[3] Learning Microsoft PowerPoint 2007 by Catherine Skintik, Pearson Education.

[4] LATEX for Complete Novices, Version 1.4, Nicola L. C. Talbot, Dickimaw Books, 2012.

[5] Getting Started with LATEX, David R. Wilkins, 2nd Edition, 1995.