



# COIMBATORE INSTITUTE OF TECHNOLOGY

(Government Aided Autonomous Institution)  
(Affiliated to Anna University, Chennai & Approved by AICTE, New Delhi) Established in  
1956, A Unit of V.Rangasamy Naidu Educational Trust **CIVIL AERODROME POST,**  
**COIMBATORE-641 014, TAMILNADU, INDIA**

## Criterion III – Research Innovation and Extension

### Key Indicator - 3.4 Research Publications and Awards

*3.4.1 The Institution ensures implementation of its stated Code of Ethics for research. The institution has a stated Code of Ethics for research and the implementation of which is ensured through the following:*

- 1. Inclusion of research ethics in the research methodology course work*
- 2. Presence of institutional Ethics committee (Animal, Chemical, Bio-ethics etc.)*
- 3. Plagiarism check through software*
- 4. Research Advisory Committee*

### Contents

- Copy of the syllabus of the research methodology course work to indicate research ethics

## 19MMAOE06 - RESEARCH METHODOLOGY AND IPR

L	T	P	C
3	0	0	3

### ASSESSMENT : THEORY

#### COURSE OBJECTIVES

- *To select the appropriate methodologies for carrying out the research.*
- *To identify articles based on different research methods.*
- *To write effective research proposals following research ethics.*
- *To Understand the importance of IPR in creating, investing in R&D leading to new and better products.*

#### COURSE OUTCOMES

*On Completion of the course, the students will be able to*

1. *Understand the importance of research process and integrate research ethics into the research.*
2. *Propose a research study and justify the theory as well as the methodological decisions, including sampling and measurement.*
3. *Construct effective questionnaire that employs several types of survey questions.*
4. *Emphasis the need of information about IPR and IPR protection to be considered in a research.*

#### DEFINING THE RESEARCH PROBLEM

Introduction, Meaning of Research, Objectives of Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology, Research and Scientific Method, Research Process, Defining the Research Problem: Research Problem, Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem. (8)

#### RESEARCH DESIGN

Review of the literature, searching the existing literature, reviewing the selected literature, Meaning of Research Design, Need for Research Design, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs, Important Experimental Designs (5)

#### METHODS OF DATA COLLECTION

Introduction, Experimental and Surveys, Collection of Primary Data, Collection of Secondary Data, Selection of Appropriate Method for Data Collection, Case Study Method (5)

#### MEASUREMENT AND SCALING TECHNIQUES

Design of Sample Surveys: Design of Sampling: Introduction, Sample Design, Sampling and Non-sampling Errors, Sample Survey versus Census Survey, Types of Sampling Designs. Qualitative and Quantitative Data, Classifications of Measurement Scales, Goodness of Measurement Scales, Sources of Error in Measurement, Techniques of Developing Measurement Tools, Scaling, Scale Classification Bases, Scaling Technics, Multidimensional Scaling, Deciding the Scale. (8)

#### TESTING OF HYPOTHESIS

Characteristics and application of multivariate analysis, classification of multivariate analysis, classification of multivariate analysis- important multivariate techniques, Factor analysis, path analysis

Hypothesis, Basic Concepts Concerning Testing of Hypotheses, Testing of Hypothesis, Test Statistics and Critical Region, Critical Value and Decision Rule, Procedure for Hypothesis Testing, Hypothesis Testing for Mean, Proportion, Variance, for Difference of Two Mean, for Difference of Two Proportions, for Difference of Two Variances, P-Value approach, Power of Test, Limitations of the Tests of Hypothesis.

Chi-square Test: Test of Difference of more than Two Proportions, Test of Independence of Attributes, Test of Goodness of Fit, Cautions in Using Chi Square Tests (9)

## INTERPRETATION AND REPORT WRITING

Meaning of Interpretation, Technique of Interpretation, Precaution in Interpretation, Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report, Types of Reports, Oral Presentation, Mechanics of Writing a Research Report, Precautions for Writing Research Reports. (4)

## INTELLECTUAL PROPERTY RIGHTS

Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents.

Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications. New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge, Case Studies. (6)

TOTAL : 45

## REFERENCES

1. Kothari C.R., "Research Methods: Methods and Techniques", 2<sup>nd</sup> Edition, New Age International 2016.
2. Fink A., "Conducting Research Literature Reviews: From Internet to Paper", Sage Publications, 2019.
3. John W. Creswell, Cheryl N. Poth., "Qualitative Inquiry and Research Design: Choosing among five approaches", 4<sup>th</sup> Edition, SAGE Publishing, 2017
4. Robert P. Merges, Peter S. Menell, Mark A. Lemley., "Intellectual Property in New Technological Age", 2016
5. Radhakrishnan R, Balasubramanian S, "Intellectual Property Rights: Text and Cases, Excel Books, 2008.
6. Mathew B. Miles, Huberman A, "Qualitative Data Analysis", 3<sup>rd</sup> Edition, SAGE Publication, 2014.
7. Robert K. Yin, "Case Study Research: Design & Methods, 4<sup>th</sup> Edition, SAGE Publication, 2013.
8. Kanakala K.C, Narasan A.K, Radhakrishnan V, "Indian Patent Law & Practise", Oxford University Press, 2019.

## **ONE CREDIT COURSE**

# 19MMAOC01 - ENGLISH FOR RESEARCH PAPER WRITING

L	T	P	C
0	0	0	1

## ASSESSMENT : PRACTICAL

### COURSE OBJECTIVES

- *To write effective research articles.*
- *To acquire necessary vocabulary as known as develop the processes and strategies to produce academic writing*
- *To write proposals well approved communication and respond appropriately to case reviews / studies*

### COURSE OUTCOMES

*On Completion of the course, the students will be able to*

1. *Understand that how to improve your writing skills and level of readability*
2. *Learn about what to write in each section*
3. *Understand the skills needed when writing a Title Ensure the good quality of paper at very first-time submission*

### SENTENCE FRAMING

Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness

### SENTENCE PRESENTATION

Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction

### LITERATURE

Review of the Literature, Methods, Results, Discussion, Conclusions, the Final Check.

### ABSTRACT KEY SKILLS

Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature.

### WRITING

Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions

### PHRASES

Useful phrases, how to ensure paper is as good as it could possibly be the first- time submission

### REFERENCES

1. *GoldbortR Writing for Science, Yale University Press (available on Google Books) (2006)*
2. *Model Curriculum of Engineering & Technology PG Courses [Volume-I][ 80 ]*
3. *Day R) How to Write and Publish a Scientific Paper, Cambridge University Press (2006)*
4. *Highman N (), Handbook of Writing for the Mathematical Sciences, SIAM. Highman's book 1998*
5. *Adrian Wall work , English for Writing Research Papers, Springer New York Dordrecht*
6. *Heidelberg London, 2011*