

**OFFICE ORDER**

**Date: 29-05-2023**

(Research Ethics Committee)

Institute of Engineering & Management, Kolkata has a very strong research and development base with an intention to provide research facilities to all the students and faculty members. In order to safeguard the quality and ethics of research activities of the institution, an institutional Research Ethics Committee is constructed.

Members of Committee:

<b>Name</b>	<b>Designation</b>	<b>Position</b>
Prof. Satyajit Chakrabarti	Director	Chairperson
Prof. K.P.Ghatak	Dean of Research and Development	Co-Chair
Prof. Arun Kumar Bar	Principal ,IEM Kolkata	Member
Prof. Mohuya Chakraborty	Dean of HRDC	Member
Prof. Malay Gangopadhyay	HOD , ECE	Member
Prof. Sujit Dutta	HOD ,MBA	Member
Prof. Rupam Bhattacharya	HOD BCA	Member
Prof. Rabin Mazumdar	HOD, BBA	Member
Prof. Prabir Kumar Das	HOD , BSH	Member
Prof. Subhajit Kar	HOD,EE	Member
Prof. Moutusi Biswas Singh	HOD ,CSE & IT	Member
Prof. Dwaipayan De	HOD,ME	Member
Mrs. Gauri Mazumdar	Librarian	Member



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Principal



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### **Ethics Committee Guidelines**

Institutional Ethics Committee (IEC), also referred to as, Institutional Review Board (IRB), Ethics Review Board (ERB) and Research Ethics Board (REB) in many countries and situations, serves as an independent representative and competent body to review, evaluate and decide on the scientific and ethical merits of research proposals. The primary purpose of this committee is to protect the rights, safety and well-being of human subjects who participate in a research project. The Ethics Committees are entrusted with the initial review of the proposed research protocols prior to initiation of the projects and also have a continuing responsibility of regular monitoring of the approved programs is the same are completed. The need for evaluation of research proposals has been emphasized under the Statement of General Principles at item no. 5 ([http://icmr.nic.in/human\\_ethics.htm#Guidelines](http://icmr.nic.in/human_ethics.htm#Guidelines)) pertaining to precaution and risk minimization.

#### **BASIC RESPONSIBILITIES:**

The responsibilities of an IEC can be defined as follows:-

- To protect the dignity, rights and well-being of the potential research participants.
- To ensure that universal ethical standards through plagiarism software like turnitin, Docoloc etc. and international scientific standards are expressed in terms of local community values and customs.
- To assist in the development and the education of a research community responsive to local health care requirements.

#### **COMPOSITION:**

The IECs should be multidisciplinary and multi-sectorial in composition. Independence and competence are the two hallmarks of an IEC. The number of persons in an ethics committee should be kept fairly small (8 - 12 members). It is generally accepted that a minimum of five persons is required to form the quorum without which a decision regarding the research should not be taken. The members should be a mix of medical/ non-medical, scientific and non-scientific persons including lay persons to different the differed points of view. The Ethics Committee (EC) can have as its members, individuals from other institutions or communities with adequate representation of age and gender to safeguard the interests and welfare of all sections of the community/society.

#### **APPLICATION PROCESS:**

1. All proposals should be submitted in the prescribed application form, copies of which will be available with the Member Secretary.
2. All relevant documents should be enclosed with the application.
3. The required number of copies of the proposal along with the application and documents in the prescribed format duly signed by the PI and Co-investigators/Collaborators.
4. The Member Secretary will acknowledge the receipt and indicate any lacunae.
5. The date of the meeting will be intimated to the PI who should be available to offer clarifications if necessary.
6. The decision of the IEC will be communicated in writing. If a revision is to be made, the revised document in the required number of copies should be submitted within a stipulated period of time as specified in the communication.
7. PI/Co-PI/Ph.D. students should apply through the proper channel with a covering letter mentioning the type of review requested for the submitted project.

### **REVIEW PROCEDURE:**

1. Meetings shall be held at scheduled intervals (once in 4 months, for which the dates will be decided at the end of the previous meeting). Additional meetings will be held as and when necessary.
2. The proposals will be sent to members at least 2 weeks in advance.
3. Decisions will be taken by consensus after discussions, and voting will be done if necessary.
4. PI should be available during the meeting and may be invited to offer clarifications.
5. Independent Experts may be invited to offer their opinion on specific research proposals.
6. The decisions of the meeting shall be recorded in the minute's book and shall be confirmed during the next meeting with the signature of the Chairperson on each page.
7. All the applicants, whose proposal has been approved, need to submit the annual progress report and completion report as per the prescribed format.

### **DECISION MAKING:**

1. A member shall withdraw from the meeting during the decision procedure concerning an application where a conflict of interest arises. This shall be indicated to the chairperson prior to the review of the application and recorded in the minutes.
2. Only members will make the decision. The decisions shall be taken in the absence of investigators, representatives of sponsors, consultants.
3. Decision may be to approve, reject or revise the proposals. Specific suggestions for modifications and reasons for rejection should be given.
4. Revised proposals may be subjected to an expedited review.
5. All approved proposals will be subject to the following standard conditions.

### **COMMUNICATING THE DECISION:**

1. Decision will be communicated to PI by the Member Secretary in writing.
2. Suggestions for modifications and reasons for rejection shall be communicated to the PI.

### **RECORD KEEPING AND ARCHIVING:**

1. Curriculum Vitae (CV) of all members of IEC.
2. Minutes of all meetings duly signed by the Chairperson. Copy of all correspondence with members, researchers and other regulatory bodies.
3. Copy of existing relevant national and international guidelines on research ethics and laws along with amendments.
4. All study related documents (study protocols with enclosed documents, progress reports, and SAEs) should be archived for minimum of ten years after the completion of study. A copy of filled CRF shall remain with the PI for minimum of fifteen years.



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**Paper Code: PHD-RM 101**

**Paper Name: Research Methodology**

1.

**TOPIC 1: An Introduction to Research Methodology**

Introduction to research; Meaning and Objectives of Research; Types of research, Main components of any research work; Significance of Research; Research Methods vs. Methodology, Criteria of Good Research; Research Process.

2.

**TOPIC 2: Selection of Research Topic**

Definition of a Research Problem; Problem identification; Criteria for prioritizing problems for Research; Technique Involved in Defining a Problem; Illustration.

3.

**TOPIC 3: Research Design**

Meaning and need of Research Design; Features of a Good Design; Important Concepts Relating to Research design : Dependent and Independent Variables, Extraneous Variable, Control, Confounded Relationship, Research Hypothesis, Experimental and Non-Experimental Hypothesis.

Different Research Designs in perspective of Exploratory, Descriptive and Diagnostic, Hypothesis and Testing Research Studies. Basic Principles of Experimental Designs, Important Experimental Designs namely, Before-and-After Without Control Design, After-Only with Control Design, Before-and After with Control Design, Completely Randomized Design, Randomized Block Design, Latin Square Design, Factorial Design.

4.

**TOPIC 4: Design of Sample Surveys**

Sample Design, Sampling and Non-sampling Types of Sampling Designs, Probability Random Sample Design. Errors, Sample Survey vs. Census Survey, and Non-probability Sampling.

5.

**TOPIC 5: Measurement and Scaling**

Difference between Quantitative and Qualitative Data, Classification of Measurement scales, Sources of Error in Measurement, Scaling, Scale Classification Bases' Scaling Techniques : comparative and Non-Comparative Scaling Techniques, Multidimensional Scaling, Deciding the scale.

6.

**TOPIC 6: Data Collection and Data Preparation**

Experiments and Surveys, Collection of Primary and Secondary Data, Selection of Appropriate Method for Data Collection, Case Study Method' Data Preparation Process, Questionnaire checking, Editing, coding, classification, Tabulation, Graphical Representation, Data cleaning, Data Adjusting, Missing and Outliers, Types of Analysis, Statistics in Research.

7.

**TOPIC 7: Descriptive Statistics**

Measures of Central Tendency: Mean, Median, Mode, Other Averages

Measures of Dispersion: Range, Mean Deviation, Standard Deviation

Measures of Skewness, Kurtosis

Measures of Relationship: covariance, Karl Pearson's co-efficient of correlation, Rank

Correlation, Association in Case of Attributes

Other Measures: Index Numbers, Time Series

8.

**TOPIC 8 : Sampling and Statistics Inference**

Parameter and Statistics, Sampling and Non-sampling, Sampling Distribution: Sampling Distribution of Mean and Proportion, Student's -Distribution, Chi-square Distribution, Snedecor's F-Distribution, Degree of Freedom, Standard Error'

Central Limit Theorem, Finite Population Correction, Statistical Inference: Estimation, Interval Estimation, Sample Size and its Determination, Tests of Significance (Hypothesis Testing).

9.

**TOPIC 9: Testing of Hypothesis**

Definition of Hypothesis, Basic Concepts Concerning testing of Hypothesis, Testing the Hypothesis, Test Statistic and critical Region, Critical Value and Decision Rule, Procedure for Hypothesis Testing, Limitations of the Tests of Hypotheses.

10.

**TOPIC 10 : Chi-Square Tests**

Test of Difference of more than Two Proportions, Test of independence of Attributes, Test of Goodness of Fit, Precaution taken in using Chi Square Tests.

11.

**TOPIC 11 : Analysis of Variance**

The Anova Technique, The Basic Principle of ANOVA, One-Way and Two-Way Anova, Latin Square Design, Analysis of Co-Variance.

12.

**TOPIC 12 : Other Nonparametric Methods**

Sign Tests: One Sample and Two Samples Sign Tests, Wilcoxon Signed Rank Sum Test for Single Population, Mann Whitney U Test, Run Test, Kruskal Wallis Test, Spearman's Rank Correlation.

13.

**TOPIC 13 : Linear Regression Analysis**

Dependent and Independent Variables, Simple Linear Regression Model : Least Squares Estimation, Co-efficient of Determination, Standard Error, Assumptions or Conditions Required, Confidence Interval, Prediction Interval, Multiple Linear Regression Model : Least Square Estimation , Standard Error, t-Test for the Slopes, F-Test (ANOVA); Problem of Multi-collinearity, Qualitative Explanatory Variables, Using SPSS.

14.

**TOPIC 14 : FACTOR ANALYSIS**

The Mathematical Basis, Important Methods of Factor Analysis: Centroid Method, Principal Components Method, Maximum Likelihood Method; Rotation in Factor Analysis, R-Type and Q-Type Factor Analysis, Merits and Demerits of Factor Analysis, Using SPSS.

15.

**TOPIC 15: DISCRIMINANT ANALYSIS**

Introduction, Two group Discriminant Analysis: Methodology, Assumptions, Using SPSS, Predicting Group Membership; Multiple Discriminant Analysis : Methodology, Using SPSS.

16.

**TOPIC 16 : Cluster Analysis**

Introduction, Clustering Algorithms, Agglomerative Clustering, Combining Clusters, Using SPSS.

17.

**TOPIC 17 : Other Multivariate Techniques**

Characteristics and Applications, Classification of Multivariate Techniques, Some Multivariate Techniques : Path Analysis, Canonical Correlation, Multidimensional Scaling, Multivariate Anova, Latent Structure Analysis.

18.

**TOPIC 18 : Interpretation and Report Writing**

Meaning, Techniques and Precautions related to Interpretation, Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report, Types of Reports, Oral Presentation, Mechanics and Precautions of Writing Research Reports.

**References Books**

1. Research Methodology, C.R. Kothari and Gaurav Garg, New Age International Publishers.
2. Research Methods, Gordon Rugg and Marian Petre, Tata McGraw Hill Education Private Limited.

## SYLLABUS

### RESEARCH AND PUBLICATION ETHICS

#### 1) Introduction to Ethical Reasoning

Professional and personal ethics

- What is engineering ethics?
- Understanding the distinction between ethics, morals and laws.
- Opinions vs Judgment-can we base our ethics on opinions and judgments?

#### 2) Professional responsibilities and code of ethics for engineers.

#### 3) Ethical issues in engineering and decision making.

#### 4) Ethical theories

- Teleological Theories
- Deontological Theories

#### 5) Global issues and ethical perspectives.



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