



YENEPOYA

(DEEMED TO BE UNIVERSITY)


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Accredited by NAAC with 'A' Grade

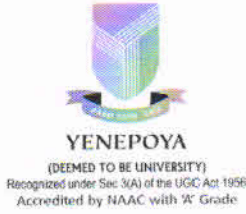
Faculty of Allied Health and Basic Science  
Ph.D. Program  
Paper I

Curriculum/Syllabus  
(Revised)

Centre Ph.D. Program  
Yenepoya (Deemed to be University)  
Deralakatte, Mangalore -575 018  
Karnataka, India

ATTESTED

  
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Ref: No. Y/REG/ACA/38-ACM/2020

14.05.2020

**NOTIFICATION – 38-ACM/13/2020 dtd. 14.05.2020**

Sub: Revision in the syllabus of Paper-I, Research Methodology  
for Pre-Ph.D course work

Ref: Resolution of the Academic council at its 38<sup>th</sup> meeting held on  
27.04.2020, vide agenda - 24

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The Academic Council at its 38<sup>th</sup> meeting held on 27.04.2020 and subsequently the Board of Management at its 49<sup>th</sup> meeting held on 30.04.2020 have resolved to approve the proposal for revision in the syllabus of Paper-I, Research Methodology for Pre Ph.D course work for all faculties:-

1. Faculty of Medicine
2. Faculty of Dentistry
3. Faculty of Nursing
4. Faculty of Allied Health and Basic Sciences
5. Faculty of Pharmacy
6. Faculty of Arts, Science, Commerce And Management
7. Faculty of Ayurveda
8. Faculty of Homeopathy

  
**REGISTRAR**  
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To,

Dy. Director, MPhil Ph.D Programme

Copy to:

1. Controller of Examinations
2. File copy

## RESEARCH METHODOLOGY

**NOTE: The content given by UGC is Unit 3 and in bold**

**Total hours : 30 hours**

**Credits : 2**

### **Unit 1. Introduction to Research: General**

**(8 hours)**

- ❖ Definition, significance of research & importance
- ❖ Kinds and purposes of Research: Diagnostic, Descriptive, Exploratory, Explanatory
- ❖ Research approaches
- ❖ Criteria of good research
- ❖ Research process : components
- ❖ Types of Research: Quantitative, qualitative, basic and applied

#### **General Topics**

- ❖ Guidelines for Research ICMR, WHO, Nursing
- ❖ Research Ethics – Animal ethics; Human ethics
- ❖ Biosafety : Good Lab Practices,

### **Unit 2. Literature survey; Proposal writing**

**(4 hours)**

- ❖ Types of Literature search – use of library, books & journals – Medlines, internet, getting patents and article reprints as a source of literature survey
- ❖ Review of Literature– Identification and selection of research problems, formulation of Hypothesis
- ❖ Preparation of research proposal, synopsis.
- ❖ Research Proposal for grants - components
- ❖ IPR and patents

### **Unit 3. Research and Publication Ethics (RPE)**

#### **RPE 01: Philosophy and ethics**

**(2 hours)**

- ❖ **Introduction to philosophy: definition, nature and scope, concept, branches**
- ❖ **Ethics: definition, moral philosophy, nature of moral judgements and reactions**

#### **RPE 02: Scientific Conduct**

**(4 hours)**

- ❖ **Ethics with respect to science and research**
- ❖ **Intellectual honesty and research integrity**
- ❖ **Scientific misconducts: Falsification, Fabrication and Plagiarism (FFP)**
- ❖ **Redundant publications: duplicate and overlapping publications, salami slicing**
- ❖ **Selective reporting and misrepresentation of data**

#### **RPE 03: Publication Ethics**

**(3 hours)**

- ❖ **Publication ethics: definition, introduction and importance**
- ❖ **Best practices/standards setting initiatives and guidelines: COPE, WAME, etc.**
- ❖ **Conflicts of interest**
- ❖ **Publication misconduct: definition, concept, problems that lead to unethical**

**behaviour and vice versa, types**

- ❖ **Violation of publication ethics, authorship and contributionship**
- ❖ **Identification of publication misconduct, complaints and appeals**
- ❖ **Predatory publishers and journals**

**RPE 04: Open Access publishing (3 hours)**

- ❖ **Open access publications and initiatives**
- ❖ **SHERPA/RoMEO online resource to check publisher copyright & self - archiving policies**
- ❖ **Software tool to identify predatory publications developed by SPPU**
- ❖ **Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.**

**RPE 05: Publication Misconduct (4 hours)**

**A. Group discussions**

- ❖ **Subject specific ethical issues, FFP, authorship**
- ❖ **Conflicts of interest**
- ❖ **Complaints and appeals: examples and fraud from India and abroad**

**B. Software tools**

**Use of plagiarism software like Turnitin, urkund and other open source software tools**

**RPE 06: Databases and Research Metrics (3 hours)**

**A. Databases**

- **Indexing databases**
- **Citation databases: Web of Science, Scopus, etc.**

**B. Research Metrics**

- **Impact factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score**
- **Metrics: h-index, g index, i10 index, altmetrics**

**Recommended Books:**

1. Ahuja R. Research Methods. Rawat Publications; 2001. 454 p.
2. Creswell JW. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Erscheinungsort Nicht Ermitteltbar: SAGE Publications Ltd.; 2013.
3. Denicolo P, Becker LM. Developing research proposals. Los Angeles: Sage; 2012.
4. Gastel B, Day RA. How to write and publish a scientific paper. Cambridge: Cambridge university press.; 2017.
5. Gupta M, Gupta D. Research methodology. PHI Learning Pvt Ltd.; 2011.
6. Gupta S. Research methodology and statistical techniques. New Delhi: Deep & Deep Publications; 2003.
7. Indrayan A. Research methods for medical graduates. Boca Raton, FL: CRC Press, Taylor & Francis Group; 2020.
8. Kothari CR, Garg G. Research methodology: methods and techniques. 4th ed. New Delhi: New Age International (P) Limited, Publishers; 2019.
9. Kumar CR. Research methodology. New Delhi: APH Publishing Corporation; 2012.
10. Kumar R. Research methodology: a step-by-step guide for beginners. London: SAGE; 2019.

12. Macrina FL. Scientific integrity: Text and cases in responsible conduct of research. 4th ed. Washington, D.C: ASM Press; 2014.
13. Mogli GD. Patient care research. New Delhi: Jaypee Brothers Medical Publishers; 2014.
14. Pannerselvam R. Research Methodology. 2<sup>nd</sup> ed. PHI Learning; 2004.
15. Polit DF, Beck CT. Nursing research: principles and methods. 7th ed. Philadelphia, Penns.: Lippincott Williams & Wilkins; 2004.
16. Taylor B, Sinha G, Ghoshal T. Research methodology: a guide for researchers in management and social sciences. PHI Learning Private Limited: 2011.
17. Gallagher J, Gorovitz, S. Levine RJ. Biomedical research ethics updating international guidelines : a consultation. World Health Organization;2000
18. Glannaon W. Biomedical Ethics ( Fundamentals of Philosophy Series). Oxford University Press; 2004, 176p.
19. Winslade W, Siegler M, Jonsen A . Clinical Ethics : a practical approach to ethical decisions in clinical medicine.8th ed. McGraw-Hill Education;2015
20. Lock S, Wells F. Fraud and misconduct in Biomedical research. 3rd ed. BMJ Books; 2001
21. Crigger B. Cases in Bioethics: Selections from the theHastings Centre report.3rd ed. Bedford; St. Martins;1998
22. Gallagher J, Gorovitz, S. Levine RJ. Biomedical research ethics updating international guidelines : a consultation. World Health Organization;2000
23. Eckenwiler LE. Cohn FG. Ethics of bioethics mapping the moral landscape. JHUP;2007
24. Altman E, Hernon P. Research Misconduct:issues implications and strategies. Praeger; 1997
25. Goyal RC. Research Methodology for Health Professionals. :including proposal, Thesis and article writing.New Delhi: Jaypee Brothers Medical Publishers;2013

## Ph.D. Course Work

### Syllabus Biostatistics

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#### Unit 1. Basic concepts and descriptive statistics: (6 hours)

- **Lecture -1:** Definition of statistics & biostatistics, population and sample, parameter and statistics; variables – different types, scales of measurement
- **Lecture -2:** Types of data: qualitative and quantitative; tabulation of data - one-way and two-way tables, frequency table; visualization of data – diagrams and graphs
- **Lecture -3:** Measures of central tendency : Mean, median,
- **Lecture -4:** mode; partition values – quartiles, percentiles
- **Lecture -5:** Measures of variability: Range, inter-quartile range, standard deviation, mean deviation and coefficient of variation.
- **Lecture -6:** Measures of skewness and kurtosis; Box plot and its application

#### Unit 2. Sampling techniques and Probability distributions (8 hours)

- **Lecture -7 :** Notion of a random variable, probability and probability distribution
- **Lecture -8 :** Normal probability distribution , properties of normal probability curve, applications of normality, divergence from normality, checking normality
- **Lecture -9:** Sampling techniques: random sampling- simple random, stratified sampling , systematic sampling,
- **Lecture 10 :** Cluster sampling; non random sampling, sample size determination

#### Unit 3. Testing of hypothesis (10 hours)

- **Lecture -10:** Estimation of population parameters, standard error
- **Lecture -11:** Principles of hypothesis testing: Null and alternate hypothesis, type-I and type -II error, power of the test, test statistic, p - value.
- **Lecture -12:** Parametric tests: Z test, t-test, F-test: applications of these tests
- **Lecture -13:** One way ANOVA , repeated measures ANOVA
- **Lecture -14:** Non-Parametric tests : Chi-Square test, Mann- Whitney test, Wilcoxon Sign rank test, Kruskal - Wallis test.

## **Unit 4: Correlation & Regression Techniques: (08 hours)**

**Lecture -15:**Correlation: scatter diagram, types of correlation

Karl Pearson's Product Moment Correlation Coefficient (r)

Spearman's Rank-order Correlation Coefficient (rho)

**Lecture -16**Linear regression analysis, Introduction to logistic regression

### **Diagnostic tests & reliability tests**

- **Lecture -19:**Sensitivity, Specificity, Positive predictive value, Negative predictive value, False positive rate, False negative rate, Odds ratio.
- **Lecture -20:**Reliability & Validity, Measures of agreement: kappa statistics, intra- class correlation coefficient(ICC).

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**NOTE: Statistical software SPSS will be taught along with theory.**

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### **Reference Books:**

1. Wayne Daniel Biostatistics: A Foundation for Analysis of Health Sciences-; John Wiley and Sons, Inc.;2009.
2. Olive Jean Dunn & Virginia A. Clark Basic Statistics:A Primer for the Biomedical Sciences John Wiley & Sons,2009
3. Jennifer Peat and Belinda Barton Medical Statistics: A Guide to Data Analysis and Critical Appraisal, Blackwell publishing, BMJ Books, 2004
4. Introductory Biostatistics : Chap T.Le, Wiley Interscience,2003
5. .D.V.Swinscow and M.J. Campbell, Statistics at Square One - 10<sup>th</sup> Edition, BMJ Books,2002
6. Bernard Rosner ,Fundamentals of Biostatistics -, 7<sup>th</sup> Edition, Brooks/Cole,2010

**AGENDA**

**Sub: Proposed revision of the Pre-Phd Course Work - Syllabus for Research Methodology in accordance with the UGC Notification - Reg.**

**Ref: D.O.No.F.1-1/2018 (Journal/CARE) dated December 2019**

The syllabus for the Research methodology is revised as per the UGC notification (ref.)

**PRE-PHD COURSE WORK - SYLLABUS FOR RESEARCH METHODOLOGY**

**Total hours : 30 hours**

**Credits : 2**

<b>Sl. No.</b>	<b>Present Syllabus</b>	<b>Proposed revision</b>	<b>Change in the syllabus</b>
1.	<b>Unit 1. Introduction to Research: General (8 hours)</b>  ❖ Definition, need ❖ Kinds and purposes of Research: Diagnostic, Descriptive, Exploratory, Explanatory ❖ Research approaches  ❖ Significance of research & importance ❖ Criteria of good research ❖ Research process : components ❖ Types of Research: Quantitative, Qualitative, Basic and applied	<b>Unit 1. Introduction to Research: General (8 hours)</b>  ❖ Definition, significance of research & importance ❖ Kinds and purposes of Research: Diagnostic, Descriptive, Exploratory, Explanatory ❖ Research approaches  ❖ Criteria of good research ❖ Research process : components ❖ Types of Research: Quantitative, qualitative, basic and applied	



	<p><b>General Topics</b></p> <ul style="list-style-type: none"> <li>❖ Guidelines for Research ICMR, WHO, Nursing</li> <li>❖ Research Ethics – Animal ethics; Human ethics</li> <li>❖ Biosafety : Good Lab Practices, <b>Scientific integrity and code of conduct; Plagiarism</b></li> </ul> <p><b>Unit 2. Literature survey; Proposal writing (6 hours)</b></p> <ul style="list-style-type: none"> <li>❖ Types of Literature search – use of library, books &amp; journals – Medlines, internet, getting patents and article reprints as a source of literature survey</li> <li>❖ Review of Literature– Formulation of Hypothesis</li> <li>❖ Identification and selection of research problems, preparation of research proposal, synopsis.</li> <li>❖ <b>Research Proposal for grants-components</b></li> <li>❖ IPR and patents</li> </ul>	<p><b>General Topics</b></p> <ul style="list-style-type: none"> <li>❖ Guidelines for Research ICMR, WHO, Nursing</li> <li>❖ Research Ethics – Animal ethics; Human ethics</li> <li>❖ Biosafety : Good Lab Practices</li> </ul> <p><b>Unit 2. Literature survey; Proposal writing (4 hours)</b></p> <ul style="list-style-type: none"> <li>❖ Types of Literature search – use of library, books &amp; journals – Medlines, internet, getting patents and article reprints as a source of literature survey</li> <li>❖ Review of Literature– Identification and selection of research problems, formulation of Hypothesis</li> <li>❖ Preparation of research proposal, synopsis,</li> <li>❖ IPR and patents</li> </ul>	<p><b>These topics are there in Unit 3</b> Scientific integrity and code of conduct; Plagiarism</p> <p><b>Deleted Research Proposal for grants- components since it is repeated.</b></p>
	<p><b>Unit 3. Research Design; Study design (6 hours)</b></p> <ul style="list-style-type: none"> <li>❖ Basic Concepts of Research Design &amp; selection of research design</li> </ul>	<p><b>Unit 3. Research and Publication Ethics (RPE)</b></p> <p><b>RPE 01: Philosophy and ethics (2 hours)</b></p> <ul style="list-style-type: none"> <li>❖ Introduction to philosophy: definition,</li> </ul>	<p><b>Units 3, 4 and 5 are replaced in the existing syllabus with the content given by UGC</b></p>

	<ul style="list-style-type: none"> <li>❖ Classification and types : Experimental, Pre-experimental, Quasi-Experimental designs and Non - experimental</li> <li>❖ Historical design, Descriptive design, case control, cohort, cross sectional, longitudinal</li> </ul> <p><b>Unit 4. Data Collection Techniques and Interpretation (6 hours)</b></p> <ul style="list-style-type: none"> <li>❖ Types of Data.</li> <li>❖ Data Collection methods: Interview; Observation; Questionnaire</li> <li>❖ Developing tools – Validity (internal &amp; external), Reliability of the tools.</li> </ul> <p>Unit 5. Research Reporting</p> <p>Scientific Writing: (6 hours)</p> <ul style="list-style-type: none"> <li>❖ General structure of scientific reports :- IMRAD; Different types of scientific documents - journal articles, books, thesis, conference and project reports</li> <li>❖ Components of a research paper - abstract, key words, main text, illustrations, supporting information; Publication process, copyright transfer. Open access</li> </ul>	<p>nature and scope, concept, branches</p> <ul style="list-style-type: none"> <li>❖ Ethics: definition, moral philosophy, nature of moral judgements and reactions</li> </ul> <p><b>RPE 02: Scientific Conduct (4 hours)</b></p> <ul style="list-style-type: none"> <li>❖ Ethics with respect to science and research</li> <li>❖ Intellectual honesty and research integrity</li> <li>❖ Scientific misconducts: Falsification, Fabrication and Plagiarism (FFP)</li> <li>❖ Redundant publications: duplicate and overlapping publications, salami slicing</li> <li>❖ Selective reporting and misrepresentation of data</li> </ul> <p>RPE 03: Publication Ethics (3 hours)</p> <ul style="list-style-type: none"> <li>❖ Publication ethics: definition, introduction and importance</li> <li>❖ Best practices/standards setting initiatives and guidelines: COPE, WAME, etc.</li> <li>❖ Conflicts of interest</li> <li>❖ Publication misconduct: definition, concept, problems that lead to unethical behaviour and vice versa, types</li> <li>❖ Violation of publication ethics, authorship and contributionship</li> <li>❖ Identification of publication misconduct, complaints and appeals</li> <li>❖ Predatory publishers and journals</li> </ul>	<p><b>Research and Publication Ethics (RPE)</b></p>
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	<p>terms</p> <ul style="list-style-type: none"> <li>❖ Thesis: Structure and Content;</li> <li>❖ Style manuals with examples (Harvard, Vancouver, APA, MLA); Citation styles: reference writing</li> <li>❖ Evaluation of research reports/papers- Criteria: novelty, originality, adequacy of information, responsibility, limitations, etc.</li> </ul>	<p><b>RPE 04: Open Access publishing (3 hours)</b></p> <ul style="list-style-type: none"> <li>❖ Open access publications and initiatives</li> <li>❖ SHERPA/RoMEO online resource to check publisher copyright &amp; self - archiving policies</li> <li>❖ Software tool to identify predatory publications developed by SPPU</li> <li>❖ Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.</li> </ul> <p><b>RPE 05: Publication Misconduct (4 hours)</b></p> <p>A. Group discussions</p> <ul style="list-style-type: none"> <li>❖ Subject specific ethical issues, FFP, authorship</li> <li>❖ Conflicts of interest</li> <li>❖ Complaints and appeals: examples and fraud from India and abroad</li> </ul> <p>B. Software tools</p> <p>Use of plagiarism software like Turnitin, urkund and other open source software tools</p> <p><b>RPE 06: Databases and Research Metrics (3 hours)</b></p> <p>A. Databases</p> <ul style="list-style-type: none"> <li>• Indexing databases</li> <li>• Citation databases: Web of</li> </ul>	
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		Science, Scopus, etc. B. Research Metrics • Impact factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score • Metrics: h-index, g index, i10 index, altmetrics	
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Sd/- Dr. Gangadhara Somayaji K. S.  
Registrar  
Yenepoya (Deemed to be University)

### Pre-PhD coursework

#### **SCHEME OF PH.D. COURSE WORK, EXAMINATION, EVALUATION AND DECLARATION OF RESULTS (CLAUSE NO. 07)**

1. The scheme for PhD Course Work Examination to be conducted by the University shall be as follows:
  - a) Two written papers (I and II) each of three hours duration and each carrying maximum of 100 marks and
  - b) Paper III involving review of Literature and Planning and presentation of the synopsis of the Proposed Research Work with a Tentative Title (200 marks)

<b>Papers</b>	<b>Particulars</b>	<b>No. of Credits</b>	<b>Marks</b>
Paper 1	Research Methodology and Biostatistics	4	100
Paper 2	Theoretical Foundations	4	100
Paper 3	Reviewing of Literature and Planning of the Proposed Research Work with a Tentative Title	4	200
	Total	12	400

## Ph.D. Course Work Examination

### The scheme of marks

Papers	Particulars	No. of Credits	Maximum marks		
			Theory*	Internal assessment	Total
Paper 1	Research Methodology and Biostatistics	4	70	30	100
Paper 2	Theoretical Foundations	4	70	30	100
Paper 3	Reviewing of Literature and Planning of the Proposed Research Work with a Tentative Title	4	-	-	200
	Total	12	-	-	400

*\*Theory conducted out of 100 marks and brought down to 70*

### Paper I Internal assessment calculation

**Total marks : 30**

Activity	No conducted	Maximum marks /each	Brought down
1. Internal assessment examination	Two	60	20
2. Journal club	Two	50	10
3. Class tests / Class activity	Nine	30	
4. Assignments	Ten	10	
5. Presentation of an E-Poster	One	50	
6. Review article (review of literature)	One	100	
7. Review of "Research	Once	100	

proposal for funding agency”			
8. Presentation of the review of literature	Once	10	

### **Ph.D. Course Work Examination**

Ph.D. Course Work Examination will be conducted at the end of the course work as follows

Dates of the Pre-Ph.D. examination shall be notified by the Controller of Examinations

### **PAPERS FOR THE EXAMINATION :**

Paper I	Research Methodology & Biostatistics	duration : 3 hrs	Marks 100
Paper II	Theoretical Foundations	duration : 3 hrs	Marks 100
Paper III	Synopsis preparation and presentation		Marks 200

### **PATTERN OF QUESTION PAPER I :**

#### **Paper I Research Methodology (60 marks)**

- MCQ            15 No.'s X 1 mark
- Short essay : 5 No.'s X 5 marks
- Long Essay : 2 No.'s X 10 marks

#### **Biostatistics (40 marks)**

- MCQ :        10 No.'s × 1 mark
- Short essay : 4 No.'s × 5 marks
- Long Essay : 1 No.'s × 10 marks

### **Panel of Examiners for Paper I :**

Internal Examiner (1) Appointed from Yenepoya (Deemed to be University)

External Examiner (1) Appointed from other Universities

### **PAPER II:**

**Pattern of Paper II :** Subject related to the field of research (100 marks)

Long Essays : 5 No.'s × 20 marks

**Classification of Successful Candidates:**

The results of successful candidates at the end of the course work shall be classified on the basis of the Grade Point Average (GPA) obtained in all the papers. The Grade Point (GP) in a paper and the Grade Point Average (GPA) at the end of the course work shall be computed as follows:

The grade points (GP) in a paper shall be assigned on the basis of actual marks scored in that course as per the table below:

<b>% Marks</b>	Less than 55	55	56<60	61<65	66<70	71<75	76<80	81<85	86<90	91<95	96<100
<b>Grade Points</b>	Fails	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

The Grade Point Weights (GPW) shall then be calculated as the product of the grade points earned in the paper and the credits for the paper. The total GPW for a course is obtained by adding the GPW of all the papers.

The GPA shall then be computed by dividing the total GPW of all the papers of study by the total credits for the course.

A Ph.D. scholar has to obtain a minimum of 55% of marks or its equivalent GPA of 5.5, in the UGC 7 - point scale in the course work in order to be eligible to continue in the programme and submit the dissertation/thesis.

In case the candidate is not successful in the Ph.D. Course Work Examination in the first attempt, he/she may be given one more chance to appear for the paper in which the candidate has failed anytime when the next the examination is scheduled on payment of the requisite fees of Rs. 500/-. If the candidate is not successful in the PhD Course Work Examination, even in the second appearance, his/her provisional registration shall stand cancelled. Registration of the candidate will be confirmed only after they pass the Ph.D. Course Work Examination.