



FACULTY OF ARTS PH.D PROGRAM

ENGLISH

RESEARCH METHODOLOGY- SYLLABUS

Total Hours :60

Credits : 04

Unit-I Research Methods

Meaning of Research-Objectives of Research-Motivation in Research – Types of Research – Significance of Research –Research and Scientific Method– Criteria of good Research – Problem Encountered by Researchers in India – What is Research Problem? Selecting the Problem – Defining the Problem – Technique involved in Defining the Problem- Research Design – Different research design – Basic principles of Experimental Designs – 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-Research metrics and Indexing.

Unit-II Mechanics of Writing

Spacing, indentation and margin – Methodology in Bibliographical entries – names of persons, common and Latin abbreviations – Use of Acronyms and Alphabetism in the body- punctuations – Titles of works – Direct and in direct quotations – Ellipsis marks –Significance of round and square brackets, and underlining Use of (sic) in quotations.

Unit- III Format of Empirical Thesis

Experimental and Practical research-Purpose and significance of Empirical thesis –Choosing a field-Formulation of hypothesis – If experimental, at laboratories – new findings remaining unknown – If practical, preparing questionnaire on the basis of hypothesis – Collection of data through on the spot study – Findings by applying statistics – Arriving at a conclusion – Suggestions and recommendations. Computer applications in language research.

Unit – IVIntroduction to Theoretical Perspectives

Background to Contemporary Literary Theory, Russian Formalism, New Criticism, Feminism, Structuralism, Marxism, Modernism, Post-Modernism and Post-Colonialism

Unit – V Research and Publication Ethics (Theory) (15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgments and reactions.

SCIENTIFIC CONDUCT: (5 Hours)

1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data

PUBLICATION ETHICS: (7 Hours)

1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals

RESEARCH AND PUBLICATION ETHICS (PRACTICE) (15 HOURS) (INTERNAL)

OPEN ACCESS PUBLISHING: (4 Hours)

1. Open access publications and initiatives 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

PUBLICATION MISCONDUCT: (4 Hours)

(A) Group Discussions: 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest, 3. 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,

DATABASES AND RESEARCH METRICS: (7 Hours)

(A) Databases: 1. Indexing databases 2. Citation databases: Web of Science, Scopus, etc. (B) Research Metrics: 1. Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score 2. Metrics: h-index, g index, i10 index, altmetrics.

References:

- Nunan, D. (1992) Research Methods in Language Learning. CUP.
- Bachman, L.F. (2004) Statistical Analysis for Language Assessment. CUP.
- Kothari, C.P. (2009) Research Methodology: Methods and Techniques. New Delhi: New Age Publications.
- Mackay, A & S. M. Gass (2005) Second Language Research Methodology and Design. Mahwah, N. J : Lawrence Erlbaum.



- Sharma, B.A. V, Prasad, D. R. and Satya Narayan, P. (1983) Research Methods in Social Sciences. New Delhi: Sterling Publications Pvt. Ltd
- Bird,A.(2006). Philosophy of Science. Routledge.
- Macintyre, Alasdair (1967) A Short History of Ethics. London.
- P.Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
- National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
- Resnik,D.B.(2011).What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from <https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm>
- Beall,J.(2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179.
- <https://doi.org/10.1038/489179a>
- Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance (2019), ISBN:978-81-939482-1-7.<http://www.insaindia.res.in/pdf/EthicsBook.pdf>



FACULTY OF SCIENCE PH.D PROGRAM
BIOCHEMISTRY
RESEARCH METHODOLOGY –SYLLABUS

Total Hours: 60

Credits: 4

Unit-I Research Methods

Meaning of Research-Objectives of Research-Motivation in Research – Types of Research – Significance of Research –Research and Scientific Method– Criteria of good Research – Problem Encountered by Researchers in India – What is Research Problem? Selecting the Problem – Defining the Problem – Technique involved in Defining the Problem- Research Design – Different research design – Basic principles of Experimental Designs – 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-Research metrics and Indexing.

Unit – IIMicroscopy and Analytical Instrumentations

Principle,structure and applications of Bright field,Darkfield,Phasecontrast,Fluorescent,Electron microscopy (TEM & SEM),Confocalmicroscope and Foldscope.Atomic force microscope (AFM).pH meter-determination of pH,Colorimetry,Spectroscopy techniques – UV – Visible,Fluorescence,FTIR,Atomicabsorption,NMR,Massspectrometry,MALDIToF,IRspectrum, X-ray crystallography.

Unit – III Bioinformatics

Biological data bases – DNA sequence data bases & protein sequence data bases.Genome database – Mouse genome database.SRS-Similarity searching pair-wise sequence alignment – BLAST,FASTA.Dynamic programming – local and global alignment,Needlemanalignment.Multiple sequence alignment – Phylogeny.Structure database – Secondary structure prediction, Chou feat pass man,Neural network methods.Predicting 3 dimensional folds (Threading),Homology modeling,Molecular docking.

Unit – IV Biostatistics

Principles and practice of statistical methods in biological research – Data collection,presentation of Data – Measures of central tendency – Mean,Median,Mode,Correlation coefficient,Standarddeviation,student 't' test,chi-square test.Analysis of variance (ANOVA) and its uses.Basics of computers – types,servers,operating systems – Windows,UNIX and Linux.Finding scientific articles – Pubmed.Outline of SPSS and Mathematica.

Unit – V Research and Publication Ethics (Theory) (15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgments and reactions.

SCIENTIFIC CONDUCT: (5 Hours)

1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data,

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RESEARCH AND PUBLICATION ETHICS (PRACTICE)(15 HOURS)

OPEN ACCESS PUBLISHING:(4 Hours)

1. Open access publications and initiatives 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

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(A) Group Discussions: 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest, 3. 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,

DATABASES AND RESEARCH METRICS:(7 Hours)

(A) Databases: 1. Indexing databases 2. Citation databases: Web of Science, Scopus, etc. (B) Research Metrics: 1. Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score 2. Metrics: h-index, g index, i10 index, altmetrics.

References

- Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
- Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International. 418p.
- Arora, P.N. & Malhon, P.K. 1996. Biostatistics. Imalaya Publishing House, Mumbai.
- Jogdand SN. 2004. Gene Biotechnology Published by Himalaya Publishing House, Mumbai.
- Baxevanis, A.D. & Ouellette, B.F.F. 2001. Bioinformatics: A practical guide to the analysis of genes and proteins – Wiley Inter science – New York.
- John G Webster. 2004. Bioinstrumentation .Student edition, John Wiley & sons, Ltd.
- Kleinsmith, L. J. & Kish, V.M. 1995. Principles of Cell and Molecular Biology. 2nd edn., McLaughlin, S., Trost, K., Mac Elree, E. (eds.), Harper Collins Publishers, New York.
- Keith Wilson & John Walker. 2003. Practical Biochemistry Principles & techniques. 5th edition, Cambridge university press.
- Palanivelu P. 2001. Analytical biochemistry and separation Techniques A Laboratory manual. 2nd edition, Published by Tulsi Book Centre, Madurai, Tamilnadu.
- Ramadass, P. and A. Wilson Aruni 2009. Research and Writing - Across the Disciplines. MJP Publishers, Chennai – 600 005
- Bird, A. (2006). Philosophy of Science. Routledge.
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- Resnik, D.B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from <https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm>
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FACULTY OF SCIENCE PH.D PROGRAM
BIOSTATISTICS
RESEARCH METHODOLOGY –SYLLABUS

Total Hours:60

Credits:4

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Meaning of Research-Objectives of Research-Motivation in Research – Types of Research – Significance of Research –Research and Scientific Method– Criteria of good Research – Problem Encountered by Researchers in India – What is Research Problem? Selecting the Problem – Defining the Problem – Technique involved in Defining the Problem- Research Design – Different research design – Basic principles of Experimental Designs – 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-Research metrics and Indexing.

Unit – II Data Collection Techniques and Interpretation

Collection of Data : Primary Data –Meaning,Secondary data –Meaning–Relevance's, limitations and cautions. Data Collection methods: Interview; Observation; Questionnaire,Developing tools –Validity (internal & external),Reliability of the tools.Meaning of InterpretationsTechniques of Interpretation,Precautions in Interpretations, Data Processing;Coding, tabulations, classifications.

Unit – III Bioethics&Statistical Analysis

Bioethics: Introduction, Animal rights and animal laws in India, Prevention of cruelty to animals Act1960, Biodiversity Act 2003. Concept of 3 R – conservation (Refined- to minimize suffering, Reduced –to minimize animals, Replaced – modern tools and alternate means) Animal use in research and education ,Laboratory animal use, care and welfare, animal protection initiatives- animal welfare board of India, CDSCO,CPCSEA, ethical commitment. Working with human: consent, harm, risk and benefits.

Unit – IV Statistical Analysis

Statistical analysis using MS office -Excel, SPSS, Epi –info, R Software, online softwares, Research management tools like Zotero/Mendeley.

Unit – V Research and Publication Ethics (Theory) (15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

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SCIENTIFIC CONDUCT: (5 Hours)

1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data,

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OPEN ACCESS PUBLISHING:(4 Hours)

1. Open access publications and initiatives 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

PUBLICATION MISCONDUCT:(4 Hours)

(A) Group Discussions: 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest, 3. 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,

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**FACULTY OF SCIENCE PH.D PROGRAM
CHEMISTRY
RESEARCH METHODOLOGY –SYLLABUS**

Total Hours: 60

Credits: 4

Unit-I Research Methods

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Unit – IIMicroscopy and Analytical Instrumentations

Principle, structure and applications of Bright field, Darkfield, Phase contrast, Fluorescent, Electron microscopy (TEM & SEM), Confocal microscope and Foldscope. Atomic force microscope (AFM).pH meter-determination of pH, Colorimetry, Spectroscopy techniques – UV – Visible, Fluorescence, FT– IR, Atomic absorption, NMR, Mass spectrometry, MALDIToF, IR spectrum, X-ray crystallography.

Unit – III Separation Techniques

Centrifugation-preparative and analytical,ultracentrifugation,densitygradientcentrifugation.Principles and applications of gel – filtration,Ion- exchange,affinitychromatography;Thin layer and gas chromatography;High pressure liquid (HPLC) Chromatography,HPTLC,GC-MS,LC-MS.Electrophoresis – Principle,types and applications – PAGE (proteins),Agarose Gel Electrophoresis (Nucleic acids),Pulse field Gel Electrophoresis (PFGE),Two dimensional electrophoresis (IEF).

Unit – IV Computing and Networking

Introduction to computers and computing – hardware,Basic organization of a computer,CPU,Mainmemory,Secondarystorage,I/O device,Software,System and application software.Online search of Chemistry databases,e- journals,search engines for chemistry,chemweb.

Unit – V Research and Publication Ethics (Theory) (15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

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SCIENTIFIC CONDUCT: (5 Hours)

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- Sanjay Saxena, MS Office XP for Everyone, 1/e Vikas Publishing 2000
- Manual of M.S Office Microsoft Inc.
- Bird, A. (2006). Philosophy of Science. Routledge.
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FACULTY OF SCIENCE PH.D PROGRAM

PHYSICS

RESEARCH METHODOLOGY –SYLLABUS

Total Hours: 60

Credits: 4

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Unit – IIIStatistical Methods

Interpolation – significance of interpolation – methods of interpolation – Binomial method – Newton's method – Newton's forward form – Newton's backward form –Finite differences – Lagrange's method – theoretical distribution – Binomial – Poisson – hypergeometric and normal distributions – data fitting-principle of least squares – fitting a straight line – curve fitting – Chi square test – conditions for applying Chi square test – uses and limitations.

Unit – IV Introduction to Computing

Introduction to computers and computing – hardware,Basic organization of a computer,CPU,Mainmemory,Secondarystorage,I/O device,Software,System and application software.Programming in C: Constants – Variables – Data types – Operators and Expressions – Input/Output Statements – Control statements – Functions – Arrays – One, two, multidimensional array declarations and initializations.

Unit – V Research and Publication Ethics (Theory) (15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

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- Sanjay Saxena, MS Office XP for Everyone, 1/e Vikas Publishing 2000
- Manual of M.S Office Microsoft Inc.
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**FACULTY OF SCIENCE PH.D PROGRAM
COMPUTER SCIENCE
RESEARCH METHODOLOGY –SYLLABUS**

Total Hours: 60

Credits: 4

Unit-I Research Methods

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Unit – II Algorithms and Analysis

Elementary data Structures, Greedy method: Knapsack problem – Job sequencing with deadlines – Optimal merge patterns, Dynamic programming: Multistage graphs – Optimal binary search trees – 0/1 knapsack – Reliability design – the traveling salesperson problem – Flow shop scheduling, Basics search and traversal techniques: The techniques code Optimization – Biconnected components and depth – first search. Backtracking: The 8 – Queen's problem – Sum of subsets – Hamiltonian cycles –Knapsack problem.

Unit – III Software Engineering

Software Engineering process paradigms – Project management – Process and Project Metrics – Software estimation – Empirical estimation models – Planning – Risk analysis – Software project scheduling. Requirements Analysis and Design: Prototyping – Specification – Analysis modeling – Software design – Abstraction – Modularity – Software Architecture – Effective modular design – Cohesion and Coupling – Architecture design and Procedural design – Data flow oriented design – design patterns. User interface design – Human Computer Interface design – Interface design – Interface standards. Programming languages and coding – Language classes – Code documentation – Code efficiency – Software configuration Management – real time systems – Reverse Engineering and Re-engineering – CASE tools – Projects management, tools – analysis and design tools – Programming tools – integration and testing tools – clean room software engineering.

Unit- IV Analytical Methods (Omit Theorem and Proof)

Introduction – types of correlation – scatter diagram method – correlation graph method – coefficient of correlation – Spearman's Rank correlation coefficient – coefficient of concurrent deviation – correlation coefficient by the method of least square – Error of the coefficient of correlation – coefficient of determination. Introduction – graphic methods for studying regression – algebraic method of studying regression – Regression equation in case of correlation table – standard error of estimate – ratio of estimate.

Unit – V Research and Publication Ethics (Theory)(15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgments and reactions.

SCIENTIFIC CONDUCT: (5 Hours)

1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data,

PUBLICATION ETHICS:(7 Hours)

1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals

RESEARCH AND PUBLICATION ETHICS (PRACTICE)(15 HOURS)(INTERNAL)

OPEN ACCESS PUBLISHING:(4 Hours)

1. Open access publications and initiatives 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

PUBLICATION MISCONDUCT:(4 Hours)

(A) Group Discussions: 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest, 3. 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,

DATABASES AND RESEARCH METRICS:(7 Hours)

(A) Databases: 1. Indexing databases 2. Citation databases: Web of Science, Scopus, etc. (B) Research Metrics: 1. Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score 2. Metrics: h-index, g index, i10 index, altmetrics.

References

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- National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
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- <https://doi.org/10.1038/489179a>
- Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance (2019), ISBN:978-81-939482-1-7.<http://www.insaindia.res.in/pdf/EthicsBook.pdf>



**FACULTY OF SCIENCE PH.D PROGRAM
MATHEMATICS
RESEARCH METHODOLOGY –SYLLABUS**

Total Hours: 60

Credits: 4

Unit-I Research Methods

Meaning of Research-Objectives of Research-Motivation in Research – Types of Research – Significance of Research –Research and Scientific Method– Criteria of good Research – Problem Encountered by Researchers in India – What is Research Problem? Selecting the Problem – Defining the Problem – Technique involved in Defining the Problem- Research Design – Different research design – Basic principles of Experimental Designs – 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-Research metrics and Indexing.

Unit – II Optimization

Direct and gradient based methods for constrained and unconstrained optimization problems.

Unit – III Applied Mathematics

Fundamental properties of eigen values and eigen functions for symmetric kernels, Hilbert Schmidt theorem and some immediate consequences, solutions of integral equations with symmetric kernels.

Unit – IV Computational Methods

Numerical solution of linear and nonlinear ordinary differential equations, numerical solution of linear partial differential equations.

Unit – V Research and Publication Ethics (Theory)(15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgments and reactions.

SCIENTIFIC CONDUCT: (5 Hours)

1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data,

PUBLICATION ETHICS:(7 Hours)

1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals

RESEARCH AND PUBLICATION ETHICS (PRACTICE)(15 HOURS)(INTERNAL)

OPEN ACCESS PUBLISHING:(4 Hours)

1. Open access publications and initiatives 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

PUBLICATION MISCONDUCT:(4 Hours)

(A) Group Discussions: 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest, 3. 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,

DATABASES AND RESEARCH METRICS:(7 Hours)

(A) Databases: 1. Indexing databases 2. Citation databases: Web of Science, Scopus, etc. (B) Research Metrics: 1. Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score 2. Metrics: h-index, g index, i10 index, altmetrics.

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- Introductory Methods of Numerical Analysis –S. S. Sastry –PHI.
- Numerical Solution of Partial Differential Equations –G. D. Smith.
- Bird, A. (2006). Philosophy of Science. Routledge.
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- Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance (2019), ISBN:978-81-939482-1-7. <http://www.insaindia.res.in/pdf/EthicsBook.pdf>



FACULTY OF SCIENCE PH.D PROGRAM
MICROBIOLOGY
RESEARCH METHODOLOGY –SYLLABUS

Total Hours: 60

Credits: 4

Unit-I Research Methods

Meaning of Research-Objectives of Research-Motivation in Research – Types of Research – Significance of Research –Research and Scientific Method– Criteria of good Research – Problem Encountered by Researchers in India – What is Research Problem? Selecting the Problem – Defining the Problem – Technique involved in Defining the Problem- Research Design – Different research design – Basic principles of Experimental Designs – 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-Research metrics and Indexing.

Unit – IIMicroscopy and Analytical Instrumentations

Principle,structure and applications of Bright field,Darkfield,Phasecontrast,Fluorescent,Electron microscopy (TEM & SEM),Confocalmicroscope and Foldscope.Atomic force microscope (AFM).pH meter-determination of pH,Colorimetry,Spectroscopy techniques – UV – Visible,Fluorescence,FT-IR,Atomicabsorption,NMR,Massspectrometry,MALDIToF,IRspectrum,X-ray crystallography.

Unit – III Separation Techniques

Centrifugation-preparative and analytical,ultracentrifugation, density gradientcentrifugation.Principles and applications of gel – filtration,Ion-exchange,affinitychromatography;Thin layer and gas chromatography;High pressure liquid (HPLC) Chromatography,HPTLC,GC-MS,LC-MS.Electrophoresis – Principle,types and applications – PAGE (proteins),Agarose Gel Electrophoresis (Nucleic acids),Pulse field Gel Electrophoresis (PFGE),Two dimensional electrophoresis (IEF).Microbial Identification System (MIS).

Unit – IV Biostatistics

Principles and practice of statistical methods in biological research – Data collection,presentation of Data – Measures of central tendency – Mean,Median,Mode,Correlation coefficient,Standarddeviation,student ‘t’ test,chi-square test.Analysis of variance (ANOVA) and its uses.Basics of computers – types,servers,operating systems – Windows,UNIX and Linux.Finding scientific articles – Pubmed.Outline of SPSS and Mathematica.

Unit – V Research and Publication Ethics (Theory) (15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgments and reactions.

SCIENTIFIC CONDUCT: (5 Hours)

1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data,

PUBLICATION ETHICS:(7 Hours)

1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals

RESEARCH AND PUBLICATION ETHICS (PRACTICE)(15 HOURS)(INTERNAL)

OPEN ACCESS PUBLISHING:(4 Hours)

1. Open access publications and initiatives 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

PUBLICATION MISCONDUCT:(4 Hours)

(A) Group Discussions: 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest, 3. 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,

DATABASES AND RESEARCH METRICS:(7 Hours)

(A) Databases: 1. Indexing databases 2. Citation databases: Web of Science, Scopus, etc. (B) Research Metrics: 1. Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score 2. Metrics: h-index, g index, i10 index, altmetrics.

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- Kleinsmith, L. J. & Kish, V.M. 1995. Principles of Cell and Molecular Biology. 2nd edn., McLaughlin, S., Trost, K., Mac Elree, E. (eds.), Harper Collins Publishers, New York.
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FACULTY OF SCIENCE PH.D PROGRAM
ZOOLOGY
RESEARCH METHODOLOGY –SYLLABUS

Total Hours: 60

Credits: 4

Unit-I Research Methods

Meaning of Research-Objectives of Research-Motivation in Research – Types of Research – Significance of Research –Research and Scientific Method– Criteria of good Research – Problem Encountered by Researchers in India – What is Research Problem? Selecting the Problem – Defining the Problem – Technique involved in Defining the Problem- Research Design – Different research design – Basic principles of Experimental Designs – 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-Research metrics and Indexing.

Unit – IIMicroscopy and Analytical Instrumentations

Principle,structure and applications of Bright field,Darkfield,Phasecontrast,Fluorescent,Electron microscopy (TEM & SEM),Confocalmicroscope and Foldscope.Atomic force microscope (AFM).pH meter-determination of pH,Colorimetry, Spectroscopy techniques – UV – Visible, Fluorescence, FT–IR,Atomicabsorption,NMR,Massspectrometry,MALDIToF,IRspectrum,X-ray crystallography.

Unit – III Histological Techniques

Processing tissue samples for light and electron microscopy,Immunochemical localization-Cryostat Sectioning – Flow cytometry – FISH and GISH – Microarray.

Unit – IVBiostatistics

Principles and practice of statistical methods in biological research – Data collection,presentation of Data – Measures of central tendency – Mean,Median,Mode,Correlation coefficient,Standarddeviation,student ‘t’ test,chi-square test.Analysis of variance (ANOVA) and its uses.Basics of computers – types,servers,operating systems – Windows,UNIX and Linux.Finding scientific articles – Pubmed.Outline of SPSS and Mathematica.

Unit – V Research and Publication Ethics (Theory) (15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgments and reactions.

SCIENTIFIC CONDUCT: (5 Hours)

1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data,

PUBLICATION ETHICS:(7 Hours)

1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals

RESEARCH AND PUBLICATION ETHICS (PRACTICE)(15 HOURS)(INTERNAL)

OPEN ACCESS PUBLISHING:(4 Hours)

1. Open access publications and initiatives 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

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(A) Group Discussions: 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest, 3. 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,

DATABASES AND RESEARCH METRICS:(7 Hours)

(A) Databases: 1. Indexing databases 2. Citation databases: Web of Science, Scopus, etc. (B) Research Metrics: 1. Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score 2. Metrics: h-index, g index, i10 index, altmetrics.

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- <https://doi.org/10.1038/489179a>
- Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance (2019), ISBN:978-81-939482-1-7. <http://www.insaindia.res.in/pdf/EthicsBook.pdf>



COMMERCE & MANAGEMENT
RESEARCH METHODOLOGY –SYLLABUS

Total Hours: 60

Credits: 4

Unit-I Research Methods

Meaning of Research-Objectives of Research-Motivation in Research – Types of Research – Significance of Research –Research and Scientific Method– Criteria of good Research – Problem Encountered by Researchers in India – What is Research Problem? Selecting the Problem – Defining the Problem – Technique involved in Defining the Problem- Research Design – Different research design – Basic principles of Experimental Designs – 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-Research metrics and Indexing.

Unit – II

Sampling design – Meaning – Concepts – Steps in sampling – Criteria for good sample design – Types of sample designs – Probability and Non-Probability samples – Sample size determination – Data collection – Data collection: Types of data – Sources – Tools for data collection – Constructing Questionnaire – Reliability and Validity – Pilot study – Data Pre-Processing : Coding and Editing data analysis: Exploratory, Descriptive and Inferential Analyses.

Unit – III

Test of significance: Parametric and Non-Parametric tests.Parametric tests –t test,F test and Z test – Non Parametric tests – U Test, Kruskal Wallis, Sign test – Multivariate Analysis – Factor analysis,Clusteranalysis,MDS,Discriminate Analysis Correlation and Regression analyses – Statistical Packages and its Applications – Other Tools of Model Building.

Unit – IV

Analysis and Interpretation – Significance – Points to be noted in Analysis and Interpretation – Report Writing-Layout of the Report – Types of Report – Steps in writing the Report – Foot note-Bibliography.

Unit – V Research and Publication Ethics (Theory) (15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgments and reactions.

SCIENTIFIC CONDUCT: (5 Hours)

1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data,

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OPEN ACCESS PUBLISHING:(4 Hours)

1. Open access publications and initiatives 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

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**FACULTY OF SCIENCE PH.D PROGRAM
CLINICAL PSYCHOLOGY
RESEARCH METHODOLOGY- SYLLABUS**

Total Hours : 60

Credits : 04

Unit: 1 conceptualizing a research study

Introduction to health research - Formulating research question, hypothesis and objectives - Literature review

Unit: 2 Epidemiological considerations in designing a research study

Measures of disease frequency - Descriptive study designs - Analytical study designs - Experimental study designs - Validity of epidemiological studies - Qualitative research methods: An overview

Unit: 3 Bio-statistical considerations in designing a research study

Measurement of study variables - Sampling methods - Calculating sample size and power

Unit: 4 Planning a research study

Selection of study population- Study plan and project management - Designing data collection tools - Principles of data collection - Data management - Overview of data analysis

Unit – V Research and Publication Ethics (Theory) (15 Hours)

PHILOSOPHY AND ETHICS:(3 Hours)

1. Introduction to philosophy: definition, nature and scope, concept, branches
2. Ethics: definition, moral philosophy, nature of moral judgments and reactions.

SCIENTIFIC CONDUCT: (5 Hours)

1. Ethics with respect to science and research
2. Intellectual honesty and research integrity
3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
4. Redundant publications: duplicate and overlapping publications, salami slicing
5. Selective reporting and misrepresentation of data

PUBLICATION ETHICS:(7 Hours)

1. Publication ethics: definition, introduction and importance
2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
3. Conflicts of interest
4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
5. Violation of

publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals

RESEARCH AND PUBLICATION ETHICS (PRACTICE)(15 HOURS)(INTERNAL)

OPEN ACCESS PUBLISHING:(4 Hours)

1. Open access publications and initiatives 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

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DATABASES AND RESEARCH METRICS:(7 Hours)

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Books and References

1. World Health Organization. Health research methodology: a guide for training in research methods. Manila: WHO Regional Office for the Western Pacific; 2001: p.1-10.
2. Bonita R, Beaglehole R, Kjellstrom T. Basic epidemiology. 2nd ed. Geneva: World Health Organization; 2006: p.15-23.
3. Coggon D, Rose G, Barker DJP. Epidemiology for the uninitiated. 4th ed. London: BMJ publishing Group; 1997.
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FACULTY OF ARTS PH.D PROGRAM
BIOTECHNOLOGY
RESEARCH METHODOLOGY- SYLLABUS

Total Hours :60

Credits : 04

Unit I Research Methodology

Meaning, types and objective of research, Selection of Research, methodology- philosophical, descriptive and experimental methods, Developing the hypothesis, Research process planning and conducting. Review of Literature: Procedure and steps for preparing review; Data collection:- Types of data, Sources, Methods of data collection, Constructing questionnaire, Establishing reliability and validity, Data processing:- Coding, Editing, displaying of data by tables and graphs. Thesis layout:- Preliminaries, Text of the thesis-Format and conventions, charts and diagrams, Norms for using Index and Bibliography. Scientific Writing: Scientific Document; Organization and writing of research paper, Types of Scientific Communication, short communications, monographs, technical and survey reports, Importance of publishing research paper.

Unit II Molecular Techniques

Isolation and Identification of bacteria and fungi strains; Extraction: genomic DNA and RNA; Sequencing: 16S rRNA & 18S rRNA; Recombinant DNA techniques and Genomics: Restriction and modification enzymes in cloning; PCR; DNA sequencing methods (Sanger's chain termination and automated DNA sequencing method); Next generation sequencing (NGS); Global expression profiling; Whole genome analysis of mRNA and protein expression; Real time PCR and Microarrays and their applications; ELISA, RIA, Hybridoma Technology, Q-PCR, EST analysis, DNA microarrays, Serial Analysis of Gene Expression (SAGE), RNA-Seq and in-situ hybridization.

Unit III Analytical techniques

Chromatography techniques: gel filtration, Ion exchange, affinity, HPLC, FPLC; Electrophoresis techniques- SDS, AGE, IEF, Western blot, Northern blot; Software Tools: BLAST, Q-Pulse, EMBOSS, Clustalw. Spectroscopy techniques: UV-Vis, Fluorescence, CD, FTIR, NMR, X-ray crystallography, SPR, SEM, TEM, FETEM, LCMS, GCMS.

Unit IV Statistical Analysis

Introduction and Types of Sampling, Sampling Methods, Sampling and Non-Sampling Errors, Binomial and Poisson Distribution, Exponential, Beta & Normal Distribution, Procedure of Testing a Hypothesis, Significance Test in Attributes, Significance Test in Variables (Small and Large samples) Partial & Multiple Correlation, Multiple Regression Analysis Chi-Square Test, Sign Test & Median Test, Multivariate Analysis Technique, Analysis of Variance (ANNOVA), Description of SPSS software and uses.

Unit V Research and Publication Ethics

PHILOSOPHY AND ETHICS: 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgments and reactions.

SCIENTIFIC CONDUCT: Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data,

PUBLICATION ETHICS: 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals

RESEARCH AND PUBLICATION ETHICS (PRACTICE)(15 HOURS)(INTERNAL)

OPEN ACCESS PUBLISHING:(4 Hours) 1. Open access publications and initiatives 2.

SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies
3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

PUBLICATION MISCONDUCT:(4 Hours) (A) Group Discussions: 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest, 3. 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,

DATABASES AND RESEARCH METRICS:(7 Hours) (A) Databases: 1. Indexing databases 2. Citation databases: Web of Science, Scopus, etc. (B) Research Metrics: 1. Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score 2. Metrics: h-index, g index, i10 index, altmetrics.

References:

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FACULTY OF ARTS PH.D PROGRAM
BIOINFORMATICS
RESEARCH METHODOLOGY- SYLLABUS

Total Hours :60

Credits : 04

Unit I Research Methodology

Meaning, types and objective of research, Selection of Research, methodology- philosophical, descriptive and experimental methods, Developing the hypothesis, Research process planning and conducting. Review of Literature: Procedure and steps for preparing review; Data collection:- Types of data, Sources, Methods of data collection, Constructing questionnaire, Establishing reliability and validity, Data processing:- Coding, Editing, displaying of data by tables and graphs. Thesis layout:- Preliminaries, Text of the thesis-Format and conventions, charts and diagrams, Norms for using Index and Bibliography. Scientific Writing: Scientific Document; Organization and writing of research paper, Types of Scientific Communication, short communications, monographs, technical and survey reports, Importance of publishing research paper.

Unit II Bioinformatics Databases

Genome Databases: ICTVdb, GOLD, MBGD; Genome Browsers:- Ensembl, VEGA genome browser, NCBI-NCBI map viewer, KEGG, MIPS, UCSC Genome Browser; Sequence Databases:- GenBank, EMBL, DDBJ; Swiss-Prot, TrEMBL, UniProt, Sequence motifs Databases:- Prosite, ProDom, Pfam, InterPro, Structure and derived databases – PDB, NDB, MMDB; SCOP, CATH, FSSP, CSA; KEGG ENZYME database; STRING; Pubchem. Database search engines – Entrez, BLAST, FASTA, ScanProsite and eMOTIF, VAST and DALI, EMBOSS. Literature Databases:- Open access and open sources, PubMed, PLoS, Biomed Central, etc.; Bioinformatic Resources:- NCBI, EBI, ExPASy, RCSB.

Unit III Molecular Analysis

Sequence Analyses – Sequence similarity, homology and identification; Scoring matrices: PAM and BLOSUM; Algorithms: Smith and Waterman algorithms, pairwise alignments. Multiple sequence alignments (MSA) Algorithms: BLAST, FASTA, CLUSTALW, PSI-BLAST and PHI-BLAST analyses. Molecular Phylogenetics : Phylogenetic Tree Construction, Gene Phylogeny, Species Phylogeny; Distance measurements, Phylogenetic Tree Evaluation, Phylogenetic Programs: MEGA and PHYLIP; Macromolecular Drug Design and Simulations: Nucleic Acids (DNA and RNA); Proteins structure analysis: Primary, Secondary, super secondary, Tertiary and Quaternary structure; Validation of Protein Structure: Ramachandran Map, Chou Fasman; Molecular Dynamics: Force Fields: AMBER, CHARMM, Merck, Auto Dock, Pymol, Gromacs and CNS

Unit IV Statistical Analysis

Introduction and Types of Sampling, Sampling Methods, Sampling and Non-Sampling Errors, Binomial and Poisson Distribution, Exponential, Beta & Normal Distribution, Procedure of Testing a Hypothesis, Significance Test in Attributes, Significance Test in Variables (Small and Large samples) Partial & Multiple Correlation, Multiple Regression Analysis Chi-Square Test, Sign Test & Median Test, Multivariate Analysis Technique, Analysis of Variance (ANNOVA), Description of SPSS software and uses.

Unit V Research and Publication Ethics

PHILOSOPHY AND ETHICS: 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgments and reactions.

SCIENTIFIC CONDUCT: Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data,

PUBLICATION ETHICS: 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior

and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals

RESEARCH AND PUBLICATION ETHICS (PRACTICE)(15 HOURS)(INTERNAL)

OPEN ACCESS PUBLISHING:(4 Hours) 1. Open access publications and initiatives 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

PUBLICATION MISCONDUCT:(4 Hours) (A) Group Discussions: 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest, 3. 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,

DATABASES AND RESEARCH METRICS:(7 Hours) (A) Databases: 1. Indexing databases 2. Citation databases: Web of Science, Scopus, etc. (B) Research Metrics: 1. Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score 2. Metrics: h-index, g index, i10 index, altmetrics.

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FACULTY OF ARTS PH.D PROGRAM

Tamil

ஆராய்ச்சிநெறிமுறைகள்

Total Hours :60

Credits : 04

அலகு - I :ஆய்வுமுறைகள்

ஆய்விற்பொருள் - ஆய்வின் நோக்கங்கள் - ஆய்வில் உந்துதல் -
ஆய்வின்வகைகள் - ஆய்வின் முக்கியத்துவம் - ஆய்வும் அறிவியல் முறையும் -
சிறந்த ஆய்விற்கான அடையாளக்குறிகள் -
இந்தியாவில்ஆய்வாளர்கள்சந்திக்கும்சிக்கல்கள் -
ஆய்வுபிரச்சினைஎன்றால்என்ன? - பிரச்சினையைத்தேர்வுசெய்தல் -
பிரச்சினையைவரையறுத்தல் - பிரச்சினையைவரையறுக்கும்தொழில்நுட்பங்கள் -
ஆய்வுவடிவமைப்பு - பல்வேறுஆய்வுவடிவமைப்புகள் -
பரிசோதனைவடிவமைப்புகளின்அடிப்படைகோட்பாடுகள் -
அறிக்கைஎழுதுவதின்முக்கியத்துவம் - அறிக்கைஎழுதும்படிநிலைகள் -
ஆய்வுஅறிக்கையின்வடிவமைப்பு - அறிக்கைகளின்வகைகள் -
வாய்மொழிவிளக்கம் - ஆய்வுஅறிக்கைஎழுதும்நடைமுறை -
ஆய்வுஅறிக்கைஎழுதும்போதுகடைப்பிடிக்கவேண்டியமுன்னெச்சரிக்கைகள் -
ஆய்வுஅளவுகோல்கள்மற்றும்குறியீட்டியல்.

அலகு - II :எழுதும்நடைமுறை

இடைவெளி, பத்திநகர்த்தல்மற்றும்ஓரம் - நூல்பட்டியல்பதிவுசெய்யும்முறை -
நபர்களின்பெயர்கள், பொதுவானமற்றும்இலத்தீன்சுருக்கங்கள் -
உட்பொருளில்சுருக்கச்சொற்கள்மற்றும்முதலெழுத்துச்சொற்கள் (Acronyms,
Alphabetism) பயன்பாடு - குறியீடுகள் - படைப்புகளின்தலைப்புகள் -
நேரடிமற்றும்மறைமுகமேற்கோள்கள் - எழுத்துநீக்கம்குறியீடு (Ellipsis marks) -



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வட்டமற்றும்சதுரகுழுக்கள், அடிக்கோடிடுதல்ஆகியவற்றின்முக்கியத்துவம் -
மேற்கோள்களில் (sic) பயன்படுத்தும்முறை.

அலகு - III :கருதுகோளைசார்ந்தஆய்வினைத்திட்டமிடுதல்

பரிசோதனைமற்றும்நடைமுறைசார்ந்தஆய்வு -

ஆய்வுஅடிப்படையானநோக்கமும்அதன்முக்கியத்துவமும் - துறையைத்தேர்வுசெய்தல் -

கருதுகோளைஉருவாக்குதல் -பரிசோதனையும்ஆய்வகமும் -

புதியகண்டுபிடிப்புகள்இன்னும்வெளியிடப்படாதநிலை - நடைமுறைசார்ந்தால்,

கருதுகோளைஅடிப்படையாகக்கொண்டுகேள்வித்தாளீத்தயாரித்தல் -

நேரடிஆய்வின்மூலம்தரவுசேகரித்தல் -

புள்ளிவிவரப்பயன்பாட்டின்மூலம்முடிவுகளைஅறிதல் - தீர்மானத்துக்குவருதல் -

பரிந்துரைகள்வழங்குதல் - மொழிஆய்வில்கணினிபயன்பாடு.

அலகு - IV :கோட்பாடுகள் - ஒருபார்வை

நவீனஇலக்கியக்கோட்பாட்டின்பின்னணி - ரஷ்யவடிவவியல் (Russian Formalism)

- புதியவிமர்சனம் (New Criticism) - பெண்ணியம் - கட்டமைப்புவாதம்

(Structuralism) - மார்க்சியம் - நவீனத்துவம் - பிந்தையநவீனத்துவம் -

பிந்தையகாலனித்துவம்.

அலகு - V :ஆராய்ச்சிமற்றும்வெளியீட்டுநெறிமுறைகள்(Theory) (15 Hours)

தத்துவம்மற்றும்நெறிமுறை

தத்துவத்தின்அறிமுகம் :வரையறை, இயல்புமற்றும்வாய்ப்பு, கருத்து, கிளைகள்

நெறிமுறைகள் :வரையறை, நெறிமுறைமதிப்புரைகள்மற்றும்பதில்களின்தன்மை.

அறிவியல்செயல்முறைஒழுங்கு(5 Hours)

அறிவியல்ஆய்வுக்குரியநெறிமுறைகள் - அறிவுசார்நேர்மைமற்றும்ஆராய்ச்சிநெறிமுறைகள் -



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ஆராய்ச்சிமுறைகேடுகள் - போலியாக்கம் -உருவாக்கம் - அறிவுசார்திருட்டு - மீள்பதிப்புகள் -
நகல்வெளியீடுகள், ஒரேமாதிரியாகமீண்டும்மீண்டும்வெளிவரும்கட்டுரைகள் -
தேர்வுசெய்யப்பட்டஅறிக்கைகள்மற்றும்தரவைதவறுகச்சித்தரித்தல்

வெளியீட்டுநெறிமுறைகள் : (5 Hours)

1. வெளியீட்டுநெறிமுறைகள் - வரையறை, அறிமுகம்மற்றும்முக்கியத்துவம்
2. சிறந்தநடைமுறைகள் / தரநிர்ணயமுயற்சிகள்மற்றும்வழிகாட்டுதல்கள்: **COPE**, **WAME**போன்றவை.
3. நலமுரண்பாடு
4. வெளியீட்டுதவறுகள் - வரையறை, கருத்து,
ஒழுக்கமற்றநடத்தைக்குவழிவகுக்கும்பிரச்சினைகள்மற்றும்அதற்குமாருனநிலைகள்,
வகைகள்.
5. வெளியீட்டுஒழுக்கநெறிகளையீறுதல் - ஆசிரியர்உரிமை (Authorship)
மற்றும்பங்களிப்பாளர்உரிமை (Contributorship)
6. வெளியீட்டுதவறுகளைஅடையாளம்காணுதல், புகார்கள்மற்றும்மேல்முறையீடுகள்.
7. தரநிலையற்றபதிப்பாளர்கள்மற்றும்போலிஇதழ்கள்.

ஆராய்ச்சிமற்றும்வெளியீட்டுநெறிமுறைகள் (15 HOURS) (INTERNAL)

திறந்தஅணுகல்வெளியீடு: (4 Hours)

1. திறந்தஅணுகல்வெளியீடுகள்மற்றும்அவற்றின்முயற்சிகள்
2. SHERPA/RoMEOஆன்லைன்ஆதாரம் - பதிப்பாளர்பதிப்புரிமை (Copyright) மற்றும்சுய-
காப்பு (Self-archiving) கொள்கைகளைச்சரிபார்க்க
3. இதழ்கண்டுபிடிக்கும் / பரிந்துரைக்கும்கருவிகள் : JANE, Elsevier Journal Finder,
Springer Journal Suggested போன்றவை.

வெளியீட்டில் முறைகேடு: (4 Hours)

குழுவாதிபதிகள்:

1. பாடவாரியானநெறிமுறைசிக்கல்கள், FFP (போலியாக்கம், உருவாக்கம், களவியல்),
ஆசிரியர்உரிமை (Authorship)
2. நலன்முரண்பாடு (Conflicts of interest)



**VINAYAKA MISSION'S
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3. புகார்கள்மற்றும்மேல்முறையீடுகள்:

இந்தியாமற்றும்வெளிநாடுகளில்நிகழ்ந்தஎடுத்துக்காட்டுமோசடிகள்

(B) மென்பொருள்கருவிகள்:

8. Turnitin, Urkundமற்றும்பிறதிறந்தமூல (Open Source)

முறைகேடுகண்டறிதல்கண்டறிதல்மென்பொருள்கருவிகளைப்பயன்படுத்துதல்

தரவுத்தளங்களும்ஆய்வுஅளவுகோல்களும்:(7 Hours)

(A) தரவுத்தளங்கள் (Databases):

1. குறியீட்டு (Indexing) தரவுத்தளங்கள்

2. மேற்கோள் (Citation) தரவுத்தளங்கள் : Web of Science, Scopus போன்றவை

(B) ஆய்வுஅளவுகோல்கள் (Research Metrics):

1. இதழின்தாக்கமதிப்பெண் (Impact Factor) – Journal Citation Report, SNIP, SIR, IPP, Cite Score அடிப்படையில்

2. ஆய்வுஅளவுகோல்கள் (Metrics):

- o h-index
- o g-index
- o i10-index
- o Altmetrics

Reference Books

1. ஆராய்ச்சிமற்றும்வெளியீட்டுஅறநெறிமுறைகள் (Research and Publication Ethics) A. Manavazhagan& S. Malathi, International Institute of Tamil Studies.
2. ஆராய்ச்சிமற்றும்வெளியீட்டுநெறிமுறைகள் (Research and Publication Ethics), Dr. C. Paramasivan, Charulatha Publications.
3. ஆராய்ச்சிமற்றும்வெளியீட்டுஅறநெறிமுறைகள் (Research and Publication Ethics) Dr. Dinesh Sriwas.