ANDHRA UNIVERSITY
TRANS-DISCIPLINARY RESEARCH HUB

RESEARCH METHODOLOGY SYLLABUS FOR PHARMACY

Unit -1: **Identification and defining of the Research Problem:**

Familiarization of research areas;Review of literature using appropriate resources – reviews, research papers, books and patents;Use of tools for searching literature through electronic databases; Defining a research problem.

Unit-2: **Experimental Approaches and Methodology**:

Experimental designs to address the research problem; Pros and cons of different experimental strategies; Finalization of experimental design; Tools and techniques to execute experiments; Means to validate and analyze data; Use of statistical tools for analyzing the significance and interpretation of the data; Methods of recording observations and documentation

Unit-3: Ethics and Safety in Biological Research:

Guidelines for Biosafety and Bioethics; Institutional Biosafety Committee – Handling of Genetically modified organisms, Institutional Human and Animal Ethics Committee - compliance, concerns and approval; Safety practices and disposal of Bio-waste in the laboratory; Radioactivity and safety precautions; Handling and disposal of flammable and hazardous chemicals.

Unit-4: Presentation, Publication and Protection of Research:

Data Development of skills for scientific writing and research presentation – Term paper, Research project, Research report, Thesis, Research article and Review; Organization of the research document in to different sections (Introduction, Methodology, Results, Discussion, and Summary and Conclusions, Bibliography); Use of electronic tools for bibliographic formatting and checking Plagiarism; Development of Oral presentation skills; Patents and Intellectual property rights.

References:

1. Research Methodology: Methods And Techniques (2019) 4th ed., Kothari CR and Garg G, New Age International Publishers, ISBN: 978-9386649225.

2. Principles of Research Methodology: A Guide for Clinical Investigators (2012) 1st ed., Supino, Phyllis G., Borer, Jeffrey S, Springer, ISBN: 978-1-4614-3360-6.

3. Communicate Science Papers, Presentations, and Posters Effectively (2015) Patience GS, Boffito DC, Patience P, Academic Press, ISBN: 978-0128015001.

4. Successful Scientific Writing: A Step-by-Step Guide for the Biological and Medical Sciences (2014) 4 th ed., Matthews JR and Matthews RW, Cambridge University Press ISBN: 978-1107691933.

5. Doing Science: Design, Analysis, and Communication of Scientific Research. (2001) Valiela I, Oxford: Oxford University Press, ISBN 10:019538573X.

6. Beauchamp T.L., Walters L., Kahn J.P. & Anna C. Contemporary issues in Bioethics. Wardsworth Publishers. Co. 2013. Print

7. Cross C.L. and Wayne W.D. Biostatistics: Basic Concepts and Methodology for the Health Sciences. 10th edition, Wiley. 2014. Print

8. Davis, G.B. and Straub D.W. Writing the doctoral dissertation. 3 rd edition. Barron's Educational series. 2012. Print

9. Deepa Goel. IPR, Biosafety and Bioethics.1st edition. Pearson Education. 2013. Print

10. Krishnaswamy, K.N., Mathiranjan M., and Sivakumar, A.I. Management Research Methodology; Integration of Principles, Methods and Techniques. Pearson Education. 2011. Print

11. Montgomery, Douglas C. Design and Analysis of Experiments. 8th edition. Wiley. 2013. Print

12. Rao S and Richard J. Introduction to Biostatistics and Research Methods. 5th edition. Prentice Hall India Learning Private Limited. 2012. Print

13. IPR, Biosafety and Bioethics (2013) Parashar S, Goel D, Pearson Publishing India, ISBN: 9788131774700.

14. An Introduction to Ethical, Safety and Intellectual Property Rights Issues in Biotechnology (2017) Nambisan P, Academic Press, ISBN: 9780128092316

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MODEL QUESTIONS

1. How does a thorough review of literature contribute to the process of defining a research problem, and what tools can researchers use to efficiently search for relevant literature in their field?

2. Compare and contrast the advantages and disadvantages of cross-sectional and longitudinal experimental designs. How would you choose the most appropriate design for a given research problem?

3. Discuss the role and significance of an Institutional Human and Animal Ethics Committee (IHEC) in ensuring ethical standards in biological research. Provide examples of ethical considerations in the handling of genetically modified organisms.

4. Explain the importance of proper citation and bibliographic formatting in scientific writing. How can researchers use electronic tools to manage references and avoid plagiarism in their research papers?