



Office of Academic Research

| Details of the Research Scholar | | | | | |
|---------------------------------|---|--------|-------------|--------------|------------------|
| Name | DHIVYA G | | | Register No. | 24PDT0002 |
| Programme | Ph. D (Deep Tech) | School | SBST | Category | IFT |
| Topic of Research | A study on the detection and validation of Protein-Protein Interaction Inhibitors for Cystic Fibrosis treatment using Machine Learning-driven virtual screening approach | | | | |

| Details of Mandatory Course | | | | |
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| COURSE TITLE: | | Research Methods for Sciences PRES706L | | |
| Credit Structure | | L | T | P |
| | | 3 | 1 | 0 |
| Module 1: Research Philosophy (5 Hours) | | | | |
| Philosophy of research - definition and types of research - research methods in science: descriptive methods, predictive (relational) methods, explanatory method. | | | | |
| Module 2: Literature Sources (7 Hours) | | | | |
| Sources of scientific information - information literacy, systematic literature search, how to formulate a query, search technique, principal bibliographic databases. Medical and scientific internet search engines – building personal reference databases. Quality of papers –indices and critical appraisal. | | | | |
| Module 3: Descriptive statistics (7 Hours) | | | | |
| Data types and sources – variables and types. Descriptive statistics of categorical data and continuous data – calculations and interpretation. Estimation of parameters – hypothesis testing: tests of significance, type I and II errors, z-test, t-test, chi-square goodness-of-fit test: calculations and interpretation. Correlations – types, calculation and interpretation. | | | | |
| Module 4: Design of experiments (7 Hours) | | | | |
| Statistical concepts for designed experiments - factor types, experimental space, factor domain. Single factor experiments, multifactor experiments, analysis of variance (ANOVA) and residual analysis - fractional factorial and screening designs - designs for optimization. | | | | |
| Module 5: Life science statistics (6 Hours) | | | | |
| Survivor function and hazard function - the life table analysis: the Kaplan-Meier analysis. Comparing two groups of survival data and models for survival data. Linear regression, multiple regressions and logistic regression - analysis and interpretation. Study designs – types of clinical designs – Phase I and Phase II trials – case-control studies. | | | | |
| Module 6: Research Publications (6 Hours) | | | | |
| Research reporting – types of publications – format, structure and styles – Scientific word processors – LaTeX/MSWord/LibreOffice - Scientific tables, graphs and illustrations - Preparation of presentations and posters. Research grants – National and International agencies - Writing for grant application. Patenting. | | | | |
| Module 7: Ethics in Research | | | | |
| A brief introduction to ethics Scientific conduct and misconduct – Fabrication and other forms of misconduct affecting the truth claims of scientific findings. Authorship issues – Salami, Imalas and duplicate publication - The investigation and punishment of scientific misconduct. | | | | |
| Module 8: Ethics in Research | | | | |
| Lecture by expert. | | | | |

| References Books |
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| <p>Text Books:</p> <ol style="list-style-type: none"> 1. Kothari C.K. 2004. Research Methodology- Methods and Techniques. New Age International, New Delhi. 2. Le, C.T. 2003. Introductory Biostatistics. John Wiley & Sons, Ltd. <p>Reference Books:</p> <ol style="list-style-type: none"> 3. Wayne, W.D. Chad, L.C. 2013. Biostatistics: A foundation for analysis in the health sciences. John Wiley and Sons. 4. Singh, Y.K. 2007. Fundamentals of Research Methods and Statistics. New Age International (P) Ltd, New Delhi. 5. Forthofer, R.N. Lee, E.S., and Hernandez, M. 2007. Biostatistics: A Guide to Design, Analysis, and Discovery. Elsevier Ltd., Amsterdam. 6. Montgomery, Douglas C. 2007. Design and Analysis of Experiments, Wiley India. |
| Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar/ Tutorials |

| Approval | | | |
|----------|---------------------|-----------------|-----------|
| S.No | Name of the Member | Role | Signature |
| 1. | Dr. ABILASH V G | Dean Nominee | |
| 2. | Dr. RM. VIDHYAVATHI | External Member | |
| 3. | Dr. C. JAYAPRAKASH | External Member | |
| 4. | Dr. KUMAR K | Internal Member | |
| 5. | Dr. MANOOV R | Guide | |