MD/ MS Ayurveda

**Semester I Course - Research Methodology & Biostatistics**

(Academic Year 2024-25)

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**Dept of Integrative Health & Translational Research**

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**Unitized Syllabus for the month of Jan*-*2025**

 **Duration**: Theory - 1 hr; Practical – 2 hrs; Experiential learning – 3 hrs

 **Venue**: 24 hr Class room (Adjacent to Digital Library)

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Day** | **Time** |  | Number of Credits | Course Outcome | Lecture/ Practical Training/ Experiential Learning | Teaching faculty | Domain / Sub Domain | **Level** (Does / Shows how / Knows how / Know) | Teaching Learning Methods | Marks allotted |
| 01-01-2025 | **Wed**  | 9 – 10 am | **Departmental Postings** | --- | Respective dept HoD | --- |
| 10–1 pm | Demonstrate the review process of IAEC | 5 | CO5 | Experiential Learning  | DR Amol Velhal | AFT - VAL  | Showshow | PBL, RP |  |
| 1. 1-2 pm
 | **LUNCH BREAK** |
| 2-5 pm | **General Seminar** |
| **Unit 3**National Pharmacovigilance Program National Pharmacovigilance Program for Ayurveda medicine and Adverse Drug reporting methods **References**: 18,19,20,21 |
| 07-01-2025 | **Tues** | 9 – 10 am | **Departmental Postings** | - | Respective dept HoD | - |  |
| 10–11 am | Explain the history, objectives, hierarchy, and ADR reporting method of the Pharmacovigilance program for Ayurveda medicine & H drugs.  | 1 | CO5 | Lecture | DR Bagale | CC  | Know show | L&PPT |
| **Unit 4** Scope and Importance of IPR and Patents **References**: 22,23,24,25 |
|  |  | 11-1 pm | Outline the importance and various forms of IPR (copyright, trademark, industrial design, geographical designs, patents)  | 1 | CO5 | Practical Training | DR Velhal | CC  | Knows how | FC,L&PP T |  |
| 1-2 pm | **LUNCH BREAK** |
| 2-5 pm | **Modular Assessment Test:** 25 marks **Conducting by …..**Mock review process (Formative assessment is based on the presentation done during Experiential Learning in Unit-2—institutional ethics committees (human and animal)—constitution and review process) |
| **Biostatistics****Module 2 :** Probability, Probability Distributions, Sampling Techniques, and Sample Size Determinations**Module Learning Objectives** (At the end of the module, the students should be able to): 1. Define and explain the Concept and laws of probability 2. Explain different probability distributions, standard error, point estimate, and confidence interval. 3. Explain and relate the various types of Sampling techniques. 4. Compute sample size for Descriptive studies, Analytical studies, and RCTs. |  |
| **Unit 1.** Probability and Probability Distributions Probability - Definitions, types, and laws of probability.**References**: 13,14,21,22,23,24 |
| 08-0102025 | **Wed** | 9 – 10 am | **Departmental Postings** | - | Respective deptHoD | - |  |
| 10–11 am | Explain Sample Spaces and Events associated with a random experiment. Define probability and discuss the laws of probability. | 1 | CO1, CO2, CO4 | Lecture | DR Gopal | CK  | Know | L&PPT |
| 11-1 pm | Test and appraise the assumption of normality of given data sets using Excel and other software.  | 2 | CO1,CO2,CO4 | Practical Training | DR Gopal | PSY-SET  | Showshow | D, PAL |
| 1-2 pm | **LUNCH BREAK** |
| 2 - 5 pm | General Seminar |  |
| 09-01-2025 | **Thur** | 9 – 10 am | **Departmental Postings** | - | Respective dept HoD | - |  |
| 10–11 am | Define and discuss the properties of normal distribution and explain standard normal distribution.  | 1 | CO1, CO2, CO4 | Lecture | DR Gopal | CAP  | Knowshow | DIS,L&P PT |
| 11-1 pm | Test and appraise the assumption of normality of given data sets using Excel and other software.  | 2 | CO1, CO2, CO4 | Practical Training  | DR Gopal. | PSY-SET  | Showshow | D,PAL |
| 1-2 pm | **LUNCH BREAK** |
| 2 - 5 pm | Collect and present of different real-life events in Respective subject domains where they can apply normal, binomial, and poison concepts.  | 2 | CO1, CO2, CO4 |  Experiential Learning | DR Gopal | PSY-ADT  | Showshow | BL,D |
| 10-01-2025 | **Fri** | 9 – 10 am | **Departmental Postings** | - | Respective dept HoD | - |  |
| 10–11 am | Explain ways to test the assumption of normality (based on measures of central tendency, histogram, Shapiro-Wilk test)  | 1 | CO1, CO2, CO4 | Lecture | Dr.Gopal | CK  | Know | L&PPT |
| 11-1 pm | Interpret results in Excel and other software for testing the normality of given data sets.  | 2 | CO1, CO2, CO4 | Practical Training  | Dr Gopal | PSYGUD  | Showshow | D |
| 1-2 pm | **LUNCH BREAK** |
| 2-5 pm | Identify and justify normal, binomial, and poison distribution using a secondary dataset /Published data  | 2 | CO1, CO2, CO4 | ExperientialLearning | DR Velhal | PSY-ADT  | Showshow | BL,D,DIS ,PAL,PER ,PBL |
| 11-01-2025 | **Sat** | 9 – 10 am | **Departmental Postings** | - | Respective dept HoD | - |
| 10–11 am | Discuss assumptions, properties, and the application of binomial and poison distribution  | 1 | CO1, CO2, CO4 | Lecture | Dr.Gopal | CK  | Know | L&PPT |  |
| 11-1 pm | Compute the mean and variance of normal, binomial, and poison distribution (given the probability distribution function).  | 2 | CO1, CO2, CO4 | Practical Training  | DR Bagale | PSY-ADT  | Showshow | BL,D |
| 1-2 pm | **LUNCH BREAK** |  |
| 13-01-2025 | **Mon** | 9 – 10 am | **Departmental Postings** | - | Respective dept HoD | - |  |
| 10–11 am | Define and explain Sampling distribution, Standard Error | 1 | CO1, CO2, CO4 | Lecture | DR Bagale | CK  | Know | L&PPT |
| 11-1 pm | Compute and interpret Standard Error, Point Estimate, and confidence interval for the mean.  | 2 | CO1, CO2, CO4 | Practical Training  | DR Bagale | PSY-ADT  | Showshow | D, DIS, PT, PER, PrBL |
| 1-2 pm | **LUNCH BREAK** |
| 2-5 pm | Generate questions on probability, experimental probability, Mutually -  | 2 | CO1, CO2, CO4 | Experiential Learning  | … | PSY-ADT | Shows | BS, DIS, I |
| 14-01-2025 | **Tues** | 9 – 10 am | **Departmental Postings** | - | Respective dept HoD | - |
| 10–11 am | Point Estimate, and confidence Interval | 1 | CO1, CO2, CO4 | Lecture | DR Velhal | CK  | Know | L&PPT |  |
| 11-1 pm | Compute and interpret Standard Error, Point Estimate, and confidence interval for proportion.  | 2 | CO1, CO2, CO4 | Practical Training  | Dr.Velhal | PSY-SET  | Showshow | BL,D,IBL ,PER |
| 1-2 pm | **LUNCH BREAK** |
| 2 - 5 pm | Identify and interpret the point estimate and confidence interval in the given research papers/data sets.  | 2 | CO1, CO2, CO4 | Experiential Learning | Dr.Velhal | PSY-SET  | Showshow | BL,D |  |
| 17-01-2025 | **Fri** | 9 – 10 am | **Departmental Postings** | --- | Respective dept HoD | --- |
| 10–1pm | Identify and interpret the point estimate and confidence interval for collected data sets.  | 2 | CO1, CO2, CO4 | Practical Training  | Dr.Velhal | PSY-SET  | Showshow | D,PT,PER |
| 1. 1- 2 pm
 | **LUNCH BREAK** |
| 2-5 pm |  **Modular Assessment Test:** 25 marks; Conducting by …Working Portfolio on Experiential learning components of the module. **5 marks for each step.** **Student instructions**: 1. Submit a draft of your experiential learning. 2. Receive feedback you’re mentor on methodology. 3. Revise the report based on the feedback. 4. Include reflections on what you learned after each experiential learning. 5. Show drafts of experiential learning with notes on what was challenging and how you overcame the obstacles.  |
| **Module 3** : Research Types - Part 1**Module Learning Objectives (At the end of the module, the students should be able to)** 1. Understand types of research 2. Comprehend different methods based on the type of research 3.Apply study designs in Ayurveda medicine Research**Unit 1** Different types of research **References**: 26,95 |  |
| 20-01-2025 | **Mon** | 9 – 10 am | **Departmental Postings** | - | Respective deptHoD | - |  |
| 10–1pam | Distinguish different types of research  | 1 | CO4 | Lecture | **Dr Velhal** | CK  | Know show | L & PPT |  |
| 11-1 pm | Display different types of research with examples  | 2 | CO4 | Practical Training  | **Dr.Velhal** | PSY GUD  | Shows how | FC |  |
| 1-2 pm | **LUNCH BREAK** |
| **Unit 2:** Qualitative Research **References**: 29 |
| 2-5 pm | Describe qualitative research - definition, characteristics, relevance, types, methods of data collection, and ways to maintain robustness like credibility, transferability, dependability, and confirmability.  | 3 | CO4 | ExperientialLearning | **DrVelhal** | CC  | Knows how | L&GD,PE R |  |
| 21-01-2025 | **Tues** | 9 – 10 am | **Departmental Postings** | - | Respective dept HoD | - |  |
| 10–11 am | Identify the methods used in qualitative research.  | 4 | CO4 | Lecture | Dr.Velhal | PSY- GUD | Shows- how | CBL,DIS |
| 11-1 pm |  Practical approach in qualitative research | 6 | CO4 |  Practical Training  | Dr. Bagale  | PSYGUD  | Shows how | PBL,RP |
| 1-2 pm | **LUNCH BREAK** |
| 2 – 5 pm | Discussions and interviews to illustrate the methods of qualitative research.  | 6 | CO4 | ExperientialLearning | Dr.Velhal | PSYGUD  | Shows how | PBL,RP |
| **Unit 3** Descriptive study designs **References:** 31,98,99 |
| 22-01-2025 |  **Wed**  | 9 – 10 am | **Departmental Postings** | - | Respective dept HoD | - |  |
| 10–11 am | Explain and distinguish various types of descriptive studies (Case report, Case series, Cross-sectional, longitudinal)  | 3 | CO4 | Lecture | Dr.Velhal | CC  | Know show | L&PPT |
| 11-1pm | Differentiate the descriptive studies in published literature – Case report | 2 | CO4 |  Practical Training  | Dr.Velhal | PSY GUD  | Shows how | CBL, SDL |  |
| 1- 2 pm | **LUNCH BREAK** |
| 2 – 5 pm | **General Seminar** |
| 23-01-2025 | **Thur** | 9 – 10 am | **Departmental Postings** | - | Respective dept HoD | - |
| 10–11 am | What is Case series  | 2 | CO4 | Lecture | Dr.Velhal | PSY GUD  | Shows how | CBL, SDL |
| 11-1 pm | Differentiate the descriptive studies in published literature – Case series | 2 | CO4 | Practical Training  | DR Bagale | PSY GUD  | Shows how | CBL, SDL |
| 1-2 pm | **LUNCH BREAK** |
| 2 – 5 pm | Acquire the knowledge of conducting various descriptive studies in hospital community/classroom/hostel.  | 10 | CO4 | ExperientialLearning | **Dr.Velhal** | PSY GUD  | Shows how | PrBL,TPW |  |
| 24-01-2025 | **Fri**  | 9 – 10 am | **Departmental Postings** | - | Respective dept HoD | - |
| 10–11 am | What is Cross-sectional study ? | 1 | CO4 | Lecture | Dr.Velhal | PSY GUD  | Shows how | CBL,SDL |
| 11-1 pm | Differentiate the descriptive studies in published literature – Cross-sectional study | 2 | CO4 | Practical Training  | Dr. Bagale | PSY GUD  | Shows how | CBL,SDL |
| 1-2 pm | **LUNCH BREAK** |
| 2-5 pm | Differentiate the descriptive studies in published literature – Longitudinal study  | 2 | CO4 | ExperientialLearning | Dr.Velhal | PSY GUD  | Shows how | CBL,SDL |  |
| 25-01-2025 | **Sat**  | **Unit 4** Observational study designs **References:** 32,33,102,103 |
| 9 –10 am | **Departmental Postings** | - | Respective dept HoD | - |
| 10–11 am | What are case-control, cohort, and cross-sectional analytical studies ? | 3 | CO4 | Lecture | Dr. Bagale | CC  | Knows how | L&PPT |  |
| 11-1 pm | Distinguish various types of observational studies (case-control, cohort, and cross-sectional analytical) and their applications | 3 | CO4 | Practical Training  | Dr.Velhal | CC  | Knows how | L&PPT |  |
| 1-2 pm | **LUNCH BREAK** |
| 27-01-2025 | **Mon** | 9 –10 am | **Departmental Postings** | - | Respective dept HoD | - |
| 10–11 am | What are Case control studies  | 2 | CO4 | Lecture | Dr.Velhal | PSY GUD  | Shows how | CBL,SDL |  |
| 11-1 pm | Differentiate the case-control studies in published literature. | 2 | CO4 | Practical Training  | Dr.Bagale | PSY GUD  | Shows how | CBL,SDL |  |
| 1-2 pm | **LUNCH BREAK** |
| 2-5 pm | Examples to illustrate analytical studies from published articles | 3 | CO4 | ExperientialLearning | Dr.Velhal | CC  | Knows how | L&PPT |  |
| **Modular Assessment Test:** 25 marks; Conducting by ……..**Case-based evaluation: ( 25 Marks)** Each student will be given a published paper on a specific study design to evaluate the elements of the respective study design. Assessment of the review based on the summary of the given published research paper emphasizing the elements of the respective research design and Any practical in converted form can be taken for assessment.. |
| **Biostatistics……cont****Module 2****Unit 2** Sampling techniques and Sample size Determinations1. Population and sample parameters 2. Sampling techniques (probability & non-probability based) and Sample size Determinations: 3. Sampling designs and prerequisites for sample size computation. 4. Computation of sample size for Descriptive studies, Analytical Studies, and RCTs. **References**: 15,16,17,18,19,20 |
| 28-01-2025 | **Tues** | 9 –10 am | **Departmental Postings** | - | Respective dept HoD | - |
| 10–11 am | Explain the population, sample, parameter, and statistic.  | 1 | CO1, CO2, CO4 | Lecture | DR Gopal | CK  | Know | L&PPT |  |
| 11-1 pm | Test and appraise the assumption of normality of given data sets using Excel and other software. | 2 | CO1, CO2, CO4 | Practical Training  | DR Gopal | PSY-SET  | Showshow | D,PAL |  |
| 1-2 pm | **LUNCH BREAK** |
| 2-5 pm | Generate questions on probability, experimental probability, Mutually Exclusive, and Exhaustive Events in probability. | 2 | CO1, CO2, CO4 | ExperientialLearning | DR Gopal | PSY-ADT  | Shows-how | BS,DIS,I |  |
| 29-01-2025 | **Wed**  | 9 –10 am | **Departmental Postings** | - | Respective dept HoD | - |
| 10–11 am | Describe different Sampling techniques (Probability based) (simple, stratified, systematic, cluster)  | 1 | CO1, CO2, CO4 | Lecture | DR Gopal | CK  | Know | L&PPT |  |
| 11-1 pm | Interpret results in Excel and other software for testing the normality of given data sets. | 2 | CO1,CO2,CO4 | Practical Training  | DR Gopal | PSYGUD  | Showshow | D |  |
| 1-2 pm | **LUNCH BREAK** |
| 2-5 pm | **General Seminar** |
| 30-01-2025 | **Thur** | 9 –10 am | **Departmental Postings** | - | Respective dept HoD | - |
| 10–11 am | Describe different Sampling techniques (non-probability based) (snow ball, convenience, quota)  | 1 | CO1, CO2, CO4 | Lecture | DR Gopal | CK  | Know | L&PPT |  |
| 11-1 pm | Compute the mean and variance of normal, binomial, and poison distribution (given the probability distribution function). | 2 | CO1, CO2, CO4 | Practical Training  | DR Gopal | PSY-ADT  | Showshow | BL, D |  |
| 1-2 pm | **LUNCH BREAK** |
| 2-5 pm | Collect and present of different real-life events in Respective subject domains where they can apply normal, binomial, and poison concepts. | 2 | CO1, CO2, CO4 | ExperientialLearning | DR Gopal | PSY-ADT  | Showshow | BL, D |  |
| 31-01-2025 | **Fri** | 9 –10 am | **Departmental Postings** | - | Respective dept HoD | - |
| 10–11 am | Concept and understanding of sample size and study design (Descriptive, Analytical, and all study Designs)  | 2 | CO1,CO2,CO4 | Lecture | DR Bagale | CK  | Know | L&PPT |  |
| 11-1 pm | Compute and interpret Standard Error, Point Estimate, and confidence interval for the mean. | 2 | CO1, CO2, CO4 | Practical Training  | DR Velhal | PSY-ADT  | Showshow | D,DIS,PT, PER,PrBL |  |
| 1-2 pm | **LUNCH BREAK** |
| 2 – 5 pm | Identify and interpret the point estimate and confidence interval in the given research papers/data sets. | 3 | CO1,CO2,CO4 | ExperientialLearning | DR.Velhal | PSY-SET  | Showshow | BL,D |  |
|  |  | 2-5 pm |