# UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

## Lecture-wise Plan

Subject Name: **Teaching and Research Methodology** Subject Code- SCE301
Year: 2ndYear Semester: Third

| Module Number | Topics | Number of Lectures |
|---|---|---|
| 1 | **Instruction** | **2L** |
| | Introduction to content, Elements of instruction, Learning objectives, | 1 |
| | Roles of the teacher and the learner in instruction | 1 |
| 2 | **Teaching and Learning** | **4L** |
| | Application of theories of learning to teaching and learning, Sequence of learning and Strategies of learning, | 2 |
| | Teaching methods, their merits and demerits, | 1 |
| | Use of ICT in teaching & learning, Classroom management, Individual differences. | 1 |
| 3. | **Planning for teaching and learning** | **3L** |
| | Understanding the syllabus, Preparation of a scheme of work, | 2 |
| | Lesson plan preparation, Micro teaching | 1 |
| 4. | **Assessment and Evaluation** | **4L** |
| | Define measurement, assessment, test, evaluation, Purpose of assessment and evaluation, | 2 |
| | Types of tests, Grading and reporting the results assessment. | 1 |
| | Evaluating teaching and learning | 1 |
| 5. | **Definition and explanation of research** | **4L** |
| | Types and Paradigms of Research, History and Philosophy of Research (esp. Philosophical evolution, pathways to major discoveries & inventions), | 2 |
| | Research Process decision, planning, conducting, Classification of Research Methods; | 2 |
| | Reflective Thinking, Scientific Thinking. | 1 |
| 6. | **Research problem formulation:** | **11L** |
| | Literature review- need, objective, principles, sources, functions & its documentation, | 2 |
| | Problem formulation esp. sources, considerations & steps, Criteria of a good research problem, Defining and evaluating the research problem, | 2 |
| | Variables esp. types & conversion of concepts to variables. Research design esp. Causality, algorithmic, quantitative and qualitative designs, | 2 |
| | Various types of designs. Characteristics of a good | 3 |

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| | research design, problems and issues in research design; | |
| | Hypotheses: Construction, testing, types, errors; Design of experiments especially classification of designs and types of errors. | 2 |
| 7. | **Problem solving:** | **5L** |
| | Understanding the problem- unknowns, data & conditions, conditions - satisfiability, sufficiency, redundancy & contradiction, | 1 |
| | Separation of parts of the problem and conditions, notations; devising a plan- connection between data and unknown, similar/related problems, reuse of previous solutions, rephrasing/transforming the problem, solving partial or related problem, | 2 |
| | Transforming data and unknowns; carrying out the plan- esp. correctness of each step in multiple ways; | 1 |
| | Evaluation of solution and method- checking correctness of solution, different derivations, utility of the solution | 1 |
| **8.** | **Data & Reports:** | **5L** |
| | Infrastructural setups for research; Methods of data collection esp. validity and reliability, Sampling; Data processing and Visualization espicially Classification; | 2 |
| | Ethical issues espicially. bias, Misuse of statistical methods, Common fallacies in reasoning. Research Funding & Intellectual Property; | 1 |
| | Research reports: Research Proposal & Report writing esp. Study objectives, study design, problems and limitations; | 1 |
| | Prototype micro- project report implementing a major part of all the above (compulsory assignment) | 1 |
| **Total Number Of Hours = 38** | | |

Faculty In-Charge HOD, CSE Dept.