**NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI- 620 015**

**This course outline template acts as a guide for writing your course outline. As every course is different, please feel free to amend the template/ format to suit your requirements.**

| **COURSE OUTLINE TEMPLATE** | | | |
|---|---|---|---|
| Course Title | **PRINCIPLES OF OPERATIONS RESEARCH** | | |
| Course Code | **MAIR44** | No. of Credits | **3** |
| Department | **Mathematics** | Section | **CSE – A & B** |
| Pre-requisites Course Code | **MAIR11, MAIR21, MAIR37** | | |
| Faculty | **Mr. D. Mururgan** | Course Coordinator(s) (if, applicable) | **NIL** |
| Other Course Teacher(s) / Tutor(s) E-mail | **dmuru@nitt.edu** | Telephone No. | **9944256572** |
| Course Type | **Core course** | | |

**COURSE OVERVIEW**

- To understand the fundamental concepts of linear programming problems.
- To impart the basic concepts of linear programming technique, which arise in the Engineering applications.

**COURSE OBJECTIVES**

- To classify and formulate real-life problem for modelling, solving and applying for decision making.
- To study the formulation and various methods of solutions for linear programming, transportation, assignment , CPM and PERT problems
- To solve problems using dynamic programming method

**COURSE OUTCOMES (CO)**

| Course Outcomes | Aligned Programme Outcomes(PO) |
|---|---|
| 1. To formulate the real-life problem for modelling and solving by linear programming problems.<br>2. To Compute Transportation and assignment problems by LPP technique.<br>3. To Understanding the basic concepts of CPM, PERT and Critical path calculations.<br>4. To understanding the basic concepts of Replacement and Inventory models.<br>5. To formulate and solve the Dynamic programming problems. | The engineering under-graduates will apply their knowledge of linear programming problems techniques to solve industrially applicable problems. |

| COURSE TEACHING AND LEARNING ACTIVITIES | | | |
|---|---|---|---|
| **S.No.** | **Week** | **Topic** | **Mode of Delivery** |
| **1.** | **Week 1** | Introduction to operational research-Linear programming problems, Graphical method. | Chalk and Talk |
| | **Week 2** | Simplex method-Big M Method-Dual simplex method. | |
| | **Week 3** | Primal Dual problems, Dual theory and Sensitivity analysis. | |
| **2.** | **Week4** | Transportation problems. | Chalk and Talk |
| | **Week 5** | Assignment problems. | |
| | **Week 6** | Applications problems. | |
| **3.** | **Week 7** | CPM and PERT –Network diagram-Events and activities. | Chalk and Talk |
| | **Week 8** | Project Planning-Reducing critical events, Critical path calculations-example-Sequencing problems. | |
| | **Week9** | Replacement problems-Capital equipment-Discounting costs-Group replacement. Inventory models-various costs. | |
| | **Week 10** | Deterministic inventory models-Economic lot size. | |
| | **Week11** | Stochastic inventory models-Single period inventory models with shortage cost. | |
| | **Week 12** | Dynamic programming-Formulation-Invest problem-General allocation problem. | |
| | **Week 13** | Stage coach problem-Production Scheduling | |

| COURSE ASSESSMENT METHODS | | | | | |
|---|---|---|---|---|---|
| **S. No.** | **Plan** | **Week/Date** | **Duration** | **% Weightage** | |
| **1.** | Cycle Test –I | 7th week | 1 Hour | 20% | |
| **2.** | Cycle Test-II | 12th week | 1 Hour | 20% | |
| **3.** | Retest | 14th week | 1 Hour | | |
| **4.** | Assignments (each units two marks weightage) | | | 10% | |
| **5.** | End Semester Exam | | 3 Hours | 50% | Total : 100 Marks |

**ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc**

***Reference Books:***


1. Taha, H.A. "Operations Research: An Introduction", Pearson Education Inc.,9th edn,2014.
2. F. S. Hiller and G. J. Liebermann, Introduction to operational research, McGraw -Hill, 2014.
3. B. E. Gillet, Introduction to operational research-A computer oriented algorithmic approach, McGraw Hill, 1989.
4. H. M. Wagner, Principles of operational research with applications to managerial decisions, Prentice-Hall of India, 1999.


**COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)**

**1. Feedback from students during class committee meeting.**
**2. Anonymous feedback through questionnaire (as followed previously).**

**COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)**

1. **Test-I and Test-II will be conducted in regular class.**
2. **75% attendance is compulsory for writing the end semester examination.**
3. **In case, the students who have 65% to 74% attendance, with the genuine reasons can be allowed to appear the final assessment exam prior to providing the proof within the stipulated time.**
4. **Students with less than 65% class attendance (excluding OD, medical leave) have to redo the course.**
5. $Minimum\left\{\frac{class\ average}{2}, \frac{Maximum\ mark}{3}\right\}$ **Is the pass mark.**

**ADDITIONAL COURSE INFORMATION**

**Faculty is available for discussion after the class hours at the Department on the first floor of Lyceum. Room No. 219.**

**FOR SENATE'S CONSIDERATION**

**Course Faculty** D Murugan **CC-Chairperson** _____ **HOD** 6/1/2017

9/1/2017