## ELECTIVE –IV - OPERATIONS RESEARCH - II

| Semester | Subject Code | Category | Lecture | | Theory | | Practical | Credits |
|---|---|---|---|---|---|---|---|---|
| VI | 21CMA6E | Elective – IV | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0 | 3 |
| | | | 5 | 75 | 5 | 75 | | |

**COURSE OBJECTIVES:**

The students will be able to

- Develop computational skill and logical thinking in formulating industry oriented problems as a mathematical problem and finding solution to these problems.
- Understand the mathematics of Information Theory at the basic level.
- Inculcate knowledge on maximize the profit and minimize the cost in every place.

**COURSE OUTCOMES:**

On the successful completion of the course, the students will be able to

| CO Number | CO Statement | Knowledge Level (K1-K4) |
|---|---|---|
| **CO1** | Provide basic knowledge on game theory and able to solve practical problems related to it. | K2 |
| **CO2** | Find the optimum integer solution using Integer programming problem | K3 |
| **CO3** | Expose the fundamentals of Queueing theory and steady state analysis | K3 |
| **CO4** | Determine the sequences that minimizes the total elapsed time by sequencing problem | K3 |
| **CO5** | Discuss the constructing a project network and its importance | K4 |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze*

**MAPPING WITH PROGRAMME OUTCOMES:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|---|---|---|---|---|---|---|
| **CO1** | S | M | S | S | S | S |
| **CO2** | S | M | S | S | S | M |
| **CO3** | S | S | M | S | M | S |
| **CO4** | S | M | S | S | S | S |
| **CO5** | S | M | S | M | S | S |

*S- Strong M – Medium L – Low*

**UNIT I: GAME THEORY** **15 Hours**

Game theory – Two persons zero sum game – The Maximin and Minimax principle – Saddle points– Games without saddle points, mixed strategies – Dominance property.

(Sections: 9.1 – 9.20)

**UNIT II: INTEGER PROGRAMMING** **15 Hours**

Integer programming – Gomory's all I.P.P method.

(Sections: 6.10.1 – 6.10.6)

**UNIT III: QUEUING THEORY** **15 Hours**

Queuing Theory – Basic concepts – Steady state analysis of M/M/1 system with finite and infinite capacities.

(Sections: 10.1 – 10.9, Models I and IV)

**UNIT IV: SEQUENCING PROBLEM** **15 Hours**

Sequencing problem – n jobs through two machines, n jobs through three machines – Graphical Method.

(Sections: 5.1 – 5.4)

**UNIT V: NETWORK SCHEDULING BY CPM/PERT** **15 Hours**

Network Scheduling by CPM/PERT – Project Network Diagram – Critical Path Method (CPM) – PERT computations.

(Sections: 14.3, 14.8 – 14.9, 14.12 – 14.13, 15)

**DISTRIBUTION OF MARKS: THEORY 10% AND PROBLEMS 90%**

**TEACHING METHODOLOGY:**

1. Class room teaching
2. Giving Assignments for all units
3. Discussions
4. Home test
5. PPT presentation

**TEXT BOOK**

| S.NO | AUTHORS | TITLE | PUBLISHERS | YEAR OF PUBLICATION |
|---|---|---|---|---|
| 1. | Gupta P.K. and Hira D.S | Problems in Operations Research | S.Chand& Co.,Delhi | 2000 |

**REFERENCE BOOKS**

| S.NO | AUTHORS | TITLE | PUBLISHERS | YEAR OF PUBLICATION |
|---|---|---|---|---|
| 1. | J.K.Sharma | Operations Research : Theory and Applications | Macmillan, Delhi | 2001 |
| 2. | KantiSwaroop, Gupta P.K. Manmohan, | Problems in Operations Research | Sultan Chand & Sons | 2002 |
| 3. | Ravindran A., Philips D.T. and Solberg J.J. | Operations Research | John Wiley & Sons, New York. | 1987 |
| 4. | Taha H.A | Operations Research | Macmillan Publishing Company, New York | 2003 |
| 5. | Vittal P.R | Operations Research | MarghamPublications, Chennai | 2003 |
| 6. | Venkatesan S.J | Operations Research | J.S Publishers, Cheyyar | - |

**WEB RESOURCES**

1. *https://notendur.hi.is/kth93/3.20.pdf*
2. *https://shodhganga.inflibnet.ac.in/bitstream/10603/30974/4/06_chapter%204.pdf*
3. *https://ocw.ehu.eus/pluginfile.php/8171/mod_resource/content/1/6_Integer_Slides.pdf*
4. *https://thalis.math.upatras.gr/~tsantas/DownLoadFiles/Hillier&Lieberman_7th-edition_Chapter10.pdf*

**SYLLABUS DESIGNER**

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