

# M.TECH. IN SOFTWARE ENGINEERING

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S.N.	PAPER NO.	TITLE OF PAPERS	LECTURES	TUTORIALS	INTERNAL	EXTERNAL	TOTAL
<b>FIRST SEMESTER</b>							
1.	MTSE-110	INTRODUCTION TO SOFTWARE ENGINEERING	3	1	40	60	100
2.	MTSE-120	MODELLING & SIMULATION IN SOFTWARE ENGINEERING	3	1	40	60	100
3.	MTSE-130	TECHNICAL COMMUNICATION	3	1	40	60	100
4.	MTSE-140	SOFTWARE DESIGN & CONSTRUCTION	3	1	40	60	100
5.	MTSE-150	SOFTWARE LAB-I	4		40	60	100
<b>SECOND SEMESTER</b>							
1.	MTSE-210	SOFTWARE QUALITY MANAGEMENT	3	1	40	60	100
2.	MTSE-220	SOFTWARE VERIFICATION, VALIDATION & TESTING	3	1	40	60	100
3.	MTSE-230	SOFTWARE STANDARDS & METRICS	3	1	40	60	100
4.	MTSE-240	SOFTWARE PROJECT MANAGEMENT	3	1	40	60	100
5.	MTSE-250	SOFTWARE LAB-II	4		40	60	100
<b>THIRD SEMESTER</b>							
1.	MTSE-310	ADVANCED TOPICS IN SOFTWARE ENGINEERING	3	1	40	60	100
2.	MTSE-320	LITERATURE SURVEY		2	50		50
3.	MTSE-330	EFFECTIVE	3	1	40	60	100
4.	MTSE-340	SOFTWARE LAB-III	4		40	60	100
<b>FOURTH SEMESTER</b>							
1.	MTSE-410	THESIS					ACCEPTED/REJECTED
<b>LIST OF PAPERS FOR ELECTIVE</b>							
1.	MTSE-331	SOFTWARE RISK MANAGEMENT	43	1	40	60	100
2.	MTSE-332	SOFTWARE RELIABILITY	43	1	40	60	100
3.	MTSE-333	COMPONENT BASED COMPUTING	43	1	40	60	100

Note: There shall be nine questions in total. Question number 1 will be compulsory and will consist of short conceptual type answers covering all the Units. There shall be eight more questions, two from each unit. Students are required to attempt four questions selecting one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Max. Marks: 100 (External: 60, Internal Assessment: 40 (30 on the basis of two tests and 10 on the basis of assignments / Seminars))

Time: 3 Hours

### UNIT-1

**PRINCIPLES AND MOTIVATION:** History; definitions; why engineered approach to software development; Software development process models from the points of view of technical development and project management; waterfall, rapid prototyping, incremental development, spiral models, emphasis on computer-assisted environments.

**SOFTWARE DEVELOPMENT METHODS:** Formal, semi-formal and informal methods; Requirements elicitation, requirements specification; Data, function, and event-based modeling; Some of the popular methodologies such as Yourdon's SAD, SSADM etc; CASE tools-classification, features, strengths and weaknesses; ICASE; CASE standards.

### UNIT-2

**SOFTWARE PROJECT MANAGEMENT:** Principles of software projects management; Organizational and team structure; Project planning; Project initiation and Project termination; Technical, quality, and management plans; Project control; Cost estimation methods; Function points and COCOMO.

### UNIT-3

**SOFTWARE QUALITY MANAGEMENT:** Quality control, quality assurance and quality standards with emphasis on ISO 9000; Functions of software QA organization does in a project; interactions with developers; Quality plans, quality assurance towards quality improvement; Role of independent verification & validation; Total quality management; SEI maturity model; Software metrics.

### UNIT-4

**CONFIGURATION MANAGEMENT:** Need for configuration management; Configuration management functions and activities; Configuration management techniques; Examples and case studies.

**SOFTWARE ENGINEERING STANDARDS:** Government standards, IEEE (and other professional bodies) standards, corporate standards.

#### Reference Books:

1. Eisner Howard, Computer Aided System Engineering, Prentice-Hall, New Jersey.
2. Richard Fairley., Software Engineering Concepts, Mc-Graw Hill, New York.
3. Pankaj Jalote, An integrated Approach to Software Engineering, Narosa Pub. House, New Delhi.
4. Roger Pressman, Software Engineering: A Practitioner's Approach McGraw Hill New York.
5. Carlo Ghezzi, Mehdi Jayayeri, Dino Mawdrioli, Fundamentals of Software Engineering Prentice Hall New Jersey.
6. Doug Bell, Ian Morrey, Alan Pugh, Software Engineering : A Programming Approach Prentice-Hall, New Jersey.
7. Kenneth Shere, Software Engineering and Management, Prentice-Hall, New Jersey.

8. T.G.Lewis, Case: Computer Aided Software Engineering, Van Norstard, Rein Hold, New York.
9. Fredrick .Brooks, The Mythical Man-Month: Essays on Software Engineering, Addison-Wesley Pub. Co. MA.
10. Ian Sommerville, Software Engineering, Fourth edition Addison-Wesley Pub. Co. England.
11. Gregory Jones, Software Engineering, John Wiley & Sons, New York.

## MTSE-120: MODELLING AND SIMULATION IN SOFTWARE ENGINEERING

**Note:** There shall be nine questions in total. Question number 1 will be compulsory and will consist of short conceptual type answers covering all the Units. There shall be eight more questions, two from each unit. Students are required to attempt four questions selecting one question from each unit in addition to the compulsory question. All questions will carry equal marks.

**Max. Marks:** 100(External: 60, Internal Assessment: 40 (30 on the basis of two tests and 10 on the basis of assignments/Seminars))

**Time:** 3 Hours

### UNIT-1

**INTRODUCTION:** Concept of System, stochastic activities, continuous and discrete systems, system modeling, principals use in modeling.

**SIMULATION OF SYSTEM:** Concept of simulation of continuous system with the help of examples, use of integration formulas concept of discrete system simulation with the help of examples Generation of random numbers Generation of non-uniformly distributed random numbers.

### UNIT-2

**SIMULATION OF QUEUING SYSTEMS:** Basic concepts of queuing theory, Simulation of single server, two-server and general queuing systems.

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### UNIT-3

**SIMULATION IN INVENTORY CONTROL AND FORECASTING:** Elements of inventory theory, inventory models, Generation of Poisson and Erlang variates, forecasting and aggression analysis.

**SIMULATION OF A HYPOTHETICAL COMPUTER SYSTEM**

**DESIGN AND EVALUATION OF SIMULATION EXPERIMENTS:** Experiment layout and Validation.

### UNIT-4

**SIMULATION LANGUAGES:** Continuous and discrete simulation languages Block-Structured continuous simulation languages Expression based languages, Discrete system simulation languages GPSS, SIMSCRIPT, SIMULA Factors in selection of discrete system simulation languages.

#### Reference Books:

1. Gordon G., "System Simulation Prentice-Hall of India Pvt Ltd, New Delhi-1993
2. Narsingh Deo, "System Simulation with Digital Computer" PHI New Delhi 1993
3. Payne James, A Introduction to Simulation Programming Techniques and Methods of Analysis, McGraw Hill International Editions Computer Science Series, New York (1998).

## MESE-130: TECHNICAL COMMUNICATION

**Note:** There shall be nine questions in total. Question number 1 will be compulsory and will consist of short conceptual-type answers covering all the Units. There shall be eight more questions, two from each unit. Students are required to attempt four questions selecting one question from each unit in addition to the compulsory question. All questions will carry equal marks.

**Max. Marks:** 100(External: 60, Internal Assessment: 40 (30 on the basis of two tests and 10 on the basis of assignments /Seminars)

**Time:** 3 Hours

### UNIT-1

**INTRODUCTION:** Purpose; Importance of effective communication; Influences on communication; Media of communication; Choice of media; Techniques for improved communication.

**STUDY SKILLS:** Reading technical documentation; Reading on-line documentation; Reading on-line language references; Making notes.

### UNIT-2

**WRITTEN COMMUNICATION:** Written communication principles; Structure, layout, style; Report formats; Designing forms; using aesthetic rendering features of contemporary DTP systems; Documentation metrics, Communicability Measures.

### UNIT-3

**ORAL COMMUNICATION:** Preparation; Presentation plans; Delivery; Subject matter; Features of contemporary presentation software; Multimedia software; Assessment of effectiveness of presentation; Telephone communication; Email and 'talk' communication; Communicability Measures.

### UNIT-4

**MEETINGS:** Types and size of meetings; Preparation; Planning; Conduct and strategies; Follow-up and minutes; Group psychology (taking sides, etc.).

**CASE STUDIES.**

**Reference Books:**

1. Stuart Harris, People and Communication, NCC Publications, New Delhi.

