

## M. Tech (Software Engineering)

### About the Programme:

**Master of Technology in Software Engineering** is a two-year post-graduate programme dedicated to enlightening students with the designing, implementing, testing, and modifying of the software to make it viable, maintainable, and affordable. The programme offer students with a strong base of software engineering principles and applications in scientific and engineering domains.

### Brief view of the programme:

- ✓ **Programme Name:** M. Tech (Software Engineering)
- ✓ **Duration:** 2 Years (4 Semesters)
- ✓ **NBA Accreditation:** Yes (Accredited during 2015 to 2017)
- ✓ **Offered by the Department:** Computer Science & Engineering
- ✓ **Programme offered since:** 2005
- ✓ **Sanctioned Intake:** 18

### Objectives of the programme:

- Develop technologically competent computer professionals in today's IT-centric scenario by training them in the contemporary software engineering principles and paradigms.
- Provide students a deep insight into various cutting-edge technologies & tools and thereby creating diverse career opportunities.
- Improve analytical, logical and presentation skills of the students by applying evolving technologies of software engineering in developing practical solutions to complex problems in consonance with the legal and ethical responsibilities.
- Provide the students with project engineering and management skills catering to the changing industry needs and constraints across the advancing domains of computing.
- Prepare the students to take up research-oriented projects, industry internships and entrepreneurship endeavors by training them to work with multi-disciplinary teams and engaging them for life-long learning in pursuit of their professional accomplishment.

### Expected outcomes / deliverables of the programme:

After the successful completion of the programme, students of the programme will exhibit the following attributes:

- ❖ An ability to independently carry out research / investigation and development work to solve practical problems.

- ❖ An ability to write and present a substantial technical report / document.
- ❖ Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
- ❖ Integrate the knowledge of software engineering principles and paradigms in the design of system components and processes to meet the specific needs of the industry.
- ❖ Apply the cutting-edge technologies, skills and CASE tools necessary to identify, analyze and formulate solutions to complex engineering problems with societal commitment.
- ❖ Recognize the need to engage in lifelong learning that helps to explore all dimensions of software engineering practices and contemporary technologies with ethical values.

**Unique outcomes / deliverables of this programme include:**

- Apply the knowledge of software engineering principles and paradigms in the design of system components and processes that meet the specific needs of the industry.
- Use the techniques, skills, and CASE tools necessary for engineering practice and coordinate the construction, deployment, and maintenance of software systems.

**Programme Highlights:**

- M.Tech. Software Engineering is a PG Programme with NBA Accreditation and is approved by UGC, AICTE and JNTU Hyderabad.
- The programme is of four semesters that makes the student to explore contemporary technologies and makes the student industry ready with a focus towards research and promotes self-learning.
- Dedicated faculty with rich experience to provide exploration of good opportunities.
- The programme offers a set of core courses and elective courses, allowing students to specialize in Data Analytics, Internet of Things, Machine Learning, Software Engineering and Testing methodologies.
- The programme makes use of Languages, Platforms, and Libraries related to R, R-Studio, MATLAB, Software Testing Tools, Selenium, Python, Hadoop Framework and Java framework, PHP, WAMP, Eclipse, Tomcat and Code Blocks.
- Improves the research methodology and self-learning using Technical seminars and project works.
- The Dissertation (Major Project Work) in the third and final semester enables students to closely work with faculty with funded projects with good stipend / work with industry using internships that enables the student to see many opportunities after the graduation.
- The programme uses a Continuous Evaluation System, mentoring and monitoring by a dedicated programme coordinator who will assist the students in the entire journey of 2 years of the programme and motivates the students towards the dreams accomplishment.

- Uses the latest teaching methodologies like WIT & WIL, Course Based Projects, Learning By Doing, Lab Protocol, Story Board that escalates the learning process of the students.
- Visit to industry premises in regular time that stimulates the students to be ready for industry orientation / research promotion.
- Facilitates the student world-class infrastructure like High-end computing facility (Dedicated servers, GPUs, LMS and High-end PCs)

### Programme Curriculum:

The programme curriculum of Software Engineering is designed that meets the aspirations of the industry with practical approach, research orientation and with great social impact. The curriculum includes courses related to Core contents of the programme, Professional electives and Open electives. In each elective the programme offers a collection of rich and contemporary courses that enables the student a good choice.

### Semester-1

**R18**

Course Type	Course Code	Name of the Course	L	T	P	Contact Hours/Week	Credits
Professional Core-I	18PC1CP01	Mathematical foundations of Computer Science	3	0	0	3	3
Professional Core-II	18PC1CP02	Advanced Data Structures	3	0	0	3	3
Professional Core-III	18PC1SE01	Data Analytics	3	0	0	3	3
Professional Elective-I	18PE1SE01	Software Requirements & Estimation	3	0	0	3	3
	18PE1SE02	Object Oriented Modeling					
	18PE1SE03	Android Application Development					
Professional Elective -II	18PE1ES02	Internet of Things	3	0	0	3	3
	18PE1CP03	Ethical Hacking & Computer Forensics					
	18PE1SE04	Formal Methods in Software Engineering					
Professional Core Lab-I	18PC2CP01	Advanced Data Structures Laboratory	0	0	3	3	1.5
Professional Core Lab-II	18PC2SE01	Data Analytics Laboratory	0	0	3	3	1.5
Project	18PW4SE01	Technical Seminar	0	0	4	4	2

Audit	18AU5CS01	Research Methodology & IPR	2	0	0	2	0
<b>Total</b>			<b>17</b>	<b>0</b>	<b>10</b>	<b>27</b>	<b>20</b>

### Semester-2

**R18**

Course Type	Course Code	Name of the Course	L	T	P	Contact Hours / Week	Credits
Professional Core-IV	18PC1CP04	Advanced Algorithms	3	0	0	3	3
Professional Core-V	18PC1CP05	Soft Computing	3	0	0	3	3
Professional Core-VI	18PC1SE02	Software Quality Assurance and Testing	3	0	0	3	3
Professional Elective-III	18PE1SE05	Advanced Software Engineering Principles & Practices	3	0	0	3	3
	18PE1SE06	Web Services and Service Oriented Architecture					
	18PE1SE07	Scripting Languages					
Professional Elective -IV	18PE1SE08	Software Reengineering	3	0	0	3	3
	18PE1CP04	Cloud Computing					
	18PE1SE09	Software Architecture & Design Patterns					
Professional Core Lab-III	18PC2CP03	Advanced Algorithms Laboratory	0	0	3	3	1.5
Professional Core Lab-IV	18PC2SE02	Software Testing and Case Tools Laboratory	0	0	3	3	1.5
Project	18PW4SE02	Mini Project	0	0	4	4	2
Audit	18AU5EN01	English for Academic & Research Writing	2	0	0	2	0
<b>Total</b>			<b>17</b>	<b>0</b>	<b>10</b>	<b>27</b>	<b>20</b>

### Semester-3

**R18**

Course Type	Course Code	Name of the Course	L	T	P	Contact Hours/Week	Credits
Professional Elective-V	18PE1CP11	Blockchain Technology	3	0	0	3	3
	18PE1SE10	Software Defined Networks					
	18PE1SE11	Software Metrics					
Open Elective	18OE1IT01	Business Analytics	3	0	0	3	3
	18OE1AM01	Industrial Safety					
	18OE1AM02	Operations Research					
	18OE1AM03	Composite Materials					
	18OE1MG01	Cost Management of Engineering Projects					
	18OE1PS01	Waste to Energy					
Project	18PW4SE03	Project Phase - I	0	0	16	16	8
<b>Total</b>			<b>6</b>	<b>0</b>	<b>16</b>	<b>22</b>	<b>14</b>

#### Semester-4

**R18**

Course Type	Course Code	Name of the Course	L	T	P	Contact Hours/Week	Credits
Project	18PW4SE04	Project Phase - II	0	0	28	28	14
<b>Total</b>			<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>	<b>14</b>

**Total Credits: 68**

#### Eligibility Criteria:

B.E / B. Tech / AMIE in CSE / CSIT / Electronics & Computers Engg / IT & Computer Science and Systems Engineering or Equivalent.

**This course is for individuals who...**

are interested in designing and development of software including software applications, computer games, word processing and business application communication system, network distribution, etc.

**Students who are looking for...**

a career in areas such as software project management, software quality management, software testing, software designing, software requirement and estimation must opt this programme.

**Career path you can choose after the programme:**

- Application development specialist
- Software engineer
- Manager
- Software Developer
- Information Systems Engineer
- Software Engineering Associate
- Data Analyst / Data Scientist
- Engineering Technician and
- Health Care and R& D sector