राष्ट्रीय प्रौद्योगिकी संस्थान- आंध्रप्रदेश

NATIONAL INSTITUTE OF TECHNOLOGY, ANDHRA PRADESH

Near National Highway No. 16, Kondruprolu
TADEPALLIGUDEM– 534101, WEST GODAVARI DISTRICT, ANDHRA PRADESH, INDIA
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Vision:

To attain and sustain eminence in teaching and research in Computer Science and Engineering.

Mission:

M1: To adopt a teaching-learning process that imparts technical skills and state-of-the-art knowledge with a well-blended and balanced mix of theory and practice.

M2: To create functional centres of excellence that promote research and consultancy in the thrust sub-domains of theoretical computer science, systems and technology.

M3: To collaborate with industry and higher learning institutes of national/international repute by constituting Special Interest Groups and solve socially relevant problems.

Programme Educational Objectives (PEOs):

PEO1: Graduates will successfully pursue doctoral studies in institutes of repute and will make innovative contributions in terms of publications, patents and products.

PEO2: Graduates will have a successful career pertinent to teaching roles in academia and R&D roles in industry.

PEO3: Graduates will evolve into entrepreneurs and leaders who incubate and nurture companies to solve socially relevant problems.

Mapping of Mission with PEOs:

Mission/PEOs	PEO1	PEO2	PEO3
M1	3	3	2
M2	3	3	2
M3	3	3	3

In the mapping tables given in this document, '1' indicates a weak correlation, '2' indicates a moderate correlation and '3' denotes a strong correlation.

Programme Outcomes (POs):

The Graduate Attributes (GAs) of P.G. programmes (M.Tech.) in CSE:

GA1: Scholarship of knowledge -Acquire in-depth knowledge of specific discipline or professional area, including wider and global perspective, with an ability to discriminate, evaluate, analyze and synthesize existing and new knowledge, and integration of the same for enhancement of knowledge.

GA2: Critical thinking - Analyze complex engineering problems critically, apply independent judgment for synthesizing information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context.

GA3: Problem solving - Think laterally and originally, conceptualize and solve engineering problems, evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health and safety, cultural, societal and environmental factors in the core areas of expertise.

GA4: Research skill - Extract information pertinent to unfamiliar problems through literature survey and experiments, apply appropriate research methodologies, techniques and tools, design, conduct experiments, analyze and interpret data, demonstrate higher order skill and view things in a broader perspective, contribute individually/in group(s) to the development of scientific/technological knowledge in one or more domains of engineering.

GA5: Usage of modern tools - Create, select, learn and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering activities with an understanding of the limitations.

GA6: Collaborative and multidisciplinary work - Possess knowledge and understanding of group dynamics, recognize opportunities and contribute positively to collaborative multidisciplinary scientific research, demonstrate a capacity for self-management and teamwork, decision-making based on open-mindedness, objectivity and rational analysis in order to achieve common goals and further the learning of themselves as well as others.

GA7: Project management and finance - Demonstrate knowledge and understanding of engineering and management principles and apply the same to one's own work, as a member and leader in a team, manage projects efficiently in respective disciplines and multidisciplinary environments after consideration of economical and financial factors.

GA8: Communication - Communicate with the engineering community, and with society at large, regarding complex engineering activities confidently and effectively, such as, being able to comprehend and write effective reports and design documentation by adhering to appropriate standards, make effective presentations, and give and receive clear instructions.

GA9: Lifelong learning - Recognize the need for and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.

GA10: Ethical practices and social responsibility - Acquire professional and intellectual integrity, professional code of conduct, ethics of research and scholarship, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society.

GA11: Independent and reflective learning - Observe and examine critically the outcomes of one's actions and make corrective measures subsequently and learn from mistakes without depending on external feedback.

Mapping of PEOs with GAs:

PEO/GA	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11
PEO1	3	3	3	3	3	2	1	3	3	3	3
PEO2	3	3	3	3	3	3	1	3	3	3	3
PEO3	2	2	2	2	2	3	3	3	3	3	3

Programme Specific Outcomes (PSOs)

PSO1: Apply the fundamentals of theoretical Computer Science, Systems and Technology to design scalable, efficient, robust, maintainable and secure systems to meet the given functional and non-functional requirements and the financial, social, cultural, ethical and safety constraints imposed.

PSO2: Work in interdisciplinary IT/Research teams and meet the team's objective with an understanding of one's role in the team through innovation, adaptability, inter-personal skills and smart work.

PSO3: Exhibit a drive for learning while keeping in pace with the rapidly evolving Computer Science and its related engineering application domains.

Mapping of PSOs with the PEOs:

PSO/PEO	PEO1	PEO2	PEO3
PSO1	3	3	1
PSO2	1	3	3
PSO3	3	3	3

M.Tech. Programme Structure

Credit Distribution:

S.No	Category	Credits Offered	Min Credits
A.	**Programme Core Courses (PCC)**	28	28
B.	**Departmental Elective Courses (DEC)**	≥ 9	9
C.	**Open Elective Courses (OEC)**	≥ 6	6
D.	**Mandatory Elective (MOOCs)**	≥ 4	4
E.	**Programme Major Project**	24	24
	Minimum Credits to be earned for the award of the degree	≥ 71	71

National Institute of Technology, Andhra Pradesh

M.Tech. Degree in Computer Science and Data Analytics

COURSES OF STUDY
(For the candidates admitted from the academic year 2020 - 2021)

I YEAR I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits	Cat. Code
1	19PCS101	Randomized and Approximation Algorithms	4	-	-	4	PCC
2	19PCS102	Database System Implementation	4	-	-	4	PCC
3	19PCS103	Applied Machine Learning	4	-	-	4	PCC
4	19PCS104	Applied Machine Learning Lab	-	-	3	2	PCC
5		Elective-I	3	-	-	3	DEC
6		Elective-II*	3	-	-	3	OEC
		Total	**18**	**-**	**6**	**20**	

*Research Methodology and IPR

I YEAR II SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits	Cat. Code
1	19PCS126	Performance Modeling	4	-	-	4	PCC
2	19PCS127	Data Science and Analytics	4	-	-	4	PCC
3	19PCS128	Performance Modeling Lab	-	-	3	2	PCC
4	19PCS129	Seminar	-	-	3	2	PCC
5		Elective – III	3	-	-	3	DEC
6		Elective – IV	3	-	-	3	DEC
7		Elective – V	3	-	-	3	OEC
		Total	**17**	**-**	**6**	**21**	

II YEAR I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits	Cat. Code
1	19PCS151	Comprehensive Viva	-	-	-	2	PCC
2	19PCS152	Project Phase I	-	-	-	8	PCC
3		MOOC Elective – VI**	-	-	-	2	MEC
4		MOOC Elective – VII	-	-	-	2	MEC
		Total	-	-	-	14	

***The student can register for two number of online courses at any point of time since their admission. However, the course completion cum pass certificates shall be submitted by the end of third semester for fulfilling the credit requirements for the MOOC Electives.*

II YEAR IISEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits	Cat. Code
1	19PCS176	Project Phase II	-	-	-	16	PCC
		Total	-	-	-	16	

List of Electives: (3-0-0)

First Year First Semester:

19PCS105 Design and Analysis of Parallel Algorithms

19PCS106 Computer Security and Forensics

19PCS107 Protocol Design and Verification

19PCS108 Optimization Techniques#

19PCS109 Computational Geometry

19PCS110 Game Theory#

19PCS111 Applied Real Time Systems

19PCS112 Server, Application and Storage Security

19PCS113 Agile Software Development and Usability Engineering

19PCS114 4GN and Software Defined Networking

19PCS115 Modern Operating Systems

19PCS116 Big Data Analytics

First Year II Semester

19PCS130 Deep Learning for Natural Language Processing

19PCS131 Data Centre Design and Management

19PCS132 Fault Tolerant Computing

19PCS133 Probabilistic Graphical Modeling

19PCS134 Graphs and Combinatorial Algorithms#

19PCS135 Product Development Strategies#

19PCS136 Model Thinking#

19PCS137 Cloud Computing

19PCS138 Network Vulnerability Assessment

19PCS139 Data Warehousing and Mining

19PCS140 Parallel Programming

19PCS141 Advanced Data Mining

19PCS142 Distributed Computing

These are planned to be offered as Open Electives by the CSE Department.