



G.Pullaiah College of Engineering and Technology

(Autonomous)

(Approved by AICTE, New Delhi | NAAC Accreditation with 'A' Grade |

Accredited by NBA (CSE, ECE & EEE) | Affiliated to JNTUA)

Nandikotkur Road, Venkayapalli (V), Kurnool - 518452, Andhra Pradesh

DATE: 11-07-2019

To

The Principal,
GPCET,
Kurnool.

Sir,

Sub: Approval of ADD-ON course for II ME, III ME & IV ME Students-Regd

The department of ME requests you to accept the proposal for conducting ADD-ON Course on "Advanced Robotics" for the odd semester of II, III & IV year ME students scheduled for the duration of 42 hours. Kindly accept the proposal.

Thanking you sir,

Yours Sincerely

HOD-ME

PRINCIPAL

G.Pullaiah College of Engg & Tech.
Nandikotkur Road, VENKAYAPALLI
KURNOOL-518 452 (A.P)



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Nandikotkur Road, Venkayapalli (V), Kurnool - 518452, Andhra Pradesh

Department Circular –ADD-ON Course

DATE: 12-07-2019

The II year, III year & IV year-I semester ME Students are informed to enroll their names for ADD-ON Course on “**Advanced Robotics**” with their respective class-in-charges on or before 14-09-2019. The course commences from 15th August and the duration of the course is for 42 hours. The course is conducted from 4 pm to 5 pm regularly.

Bus facility is made available soon after the class work.

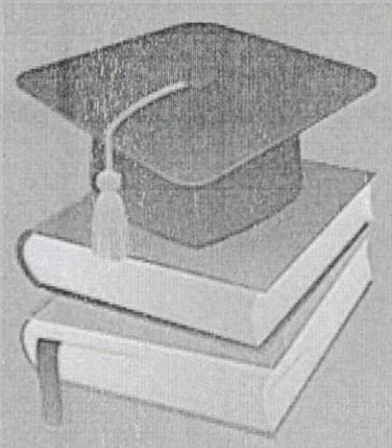
HOD-ME



**G. PULLAIAH COLLEGE OF
ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)**

Department Of Mechanical Engineering

ADD ON COURSE



Topic :Advanced Robotics
Target audience : II and III Year Students
Total CoursesDuration: 42 hrs
**Selection Procedure : Registration on First
come First serve basis**

FREE

**Register
Now**

Date of commencement of the course : 15 July , 2019.

End of Course : 09 Oct, 2019.

Exam Date: 10 Oct,2019.

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SYLLABUS FOR ADD-ON COURSE ON ADVANCED ROBOTICS

DAY	TOPICS
1	Introduction, transformations
2	DH Parameters
3	Forward and Inverse Kinematics, redundancy resolution
4	Velocity kinematics and Jacobian
5	Singular value decomposition, singularity and manipulation ability
6	Trajectory planning , dynamics
7	Sensors and actuators as used in robotics
8	Basics of linear control – PD, PID
9	controller, model based control, stability
10	Multi finger grasping – form, force closures, grasp matrix
11	Locomotion – active and passive walkers, concepts of balance
12	Biped Gait and Balance using ZMP, kinematics
13	dynamic modeling of walk
14	Design and Optimization of legged mechanisms
15	Introduction, transformations
16	DH Parameters

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G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY: KURNOOL (Autonomous)

Department of Mechanical Engineering

The following is the list of the students who have attended Add on Course on “Advanced Robotics”

17th Batch Students

S.No	ROLL NO	Name of the Candidate
1	17AT1A0301	SYED AALE RASOOL
2	17AT1A0302	SHAIK AFZAL AHMMED
3	17AT1A0303	KATIKA ALLAH BAKASH
4	17AT1A0304	PAGADAM ANANDA SWAROOP KUMAR
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P. V. V. V.

34	17AT1A0335	GURRAM REVANTH
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6	16AT1A0306	MALIGAPOGU CHARAN

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14	16AT1A0316	OBALÉ MOHAMMAD HASHAM
15	16AT1A0317	B MOHAMMAD RAFI
16	16AT1A0318	SHAIK MOHAMMED SAMEEM SAQLAIN
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36	16AT1A0339	MARAM SUMANTH
37	16AT1A0340	SALE SURESH
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39	16AT1A0342	MASEPOGU SUSMITHA
40	16AT1A0343	RODDA TARAKESHAVULU
41	16AT1A0344	KASIREDDY USHARANI
42	16AT1A0345	SREE BAREED VAMSHI KRISHNA
43	16AT1A0347	MANDA VENUGOPAL
44	16AT1A0348	VADLA VIHARI ACHARI
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53	17AT5A0306	SHAIK MAHAMMAD SANAVULLA
54	17AT5A0307	MALLEMDODDI MALLIKARJUNA
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62	17AT5A0315	SAYYED MURTHUJAVALI

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G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOG
DEPARTMENT OF MECHANICAL ENGINEERING
ADDON COURSE SCHEDULE

Date: 15/07/2019

III & IV YEAR – I Semester		
Course	Faculty	Duration
Introduction, transformations	DR.SATIESH BABU	3 hours
DH Parameters	DR.SATIESH BABU	3 hours
Forward and Inverse Kinematics, redundancy resolution	DR.SATIESH BABU	2 hours
Velocity kinematics and Jacobian	Dr.K.MALLIKARJUNA	3 hours
Singular value decomposition, singularity and manipulation ability	Dr.K.MALLIKARJUNA	2 hours
Trajectory planning , dynamics	Dr.K.MALLIKARJUNA	2 hours
Sensors and actuators as used in robotics	N.GOVINDA RAO	2 hours
Basics of linear control – PD, PID	N.GOVINDA RAO	2 hours
controller, model based control, stability	N,GOVINDA RAO	2 hours
Multi finger grasping – form, force closures, grasp matrix	S. JAVEED	2 hours
Locomotion – active and passive walkers, concepts of balance	S. JAVEED	2 hours
Biped Gait and Balance using ZMP, kinematics	S. JAVEED	2 hours
dynamic modeling of walk	A.RAMAANJANEYA REEDY	2 hours
Design and Optimization of legged mechanisms	A.RAMAANJANEYA REEDY	2 hours

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G. PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

II, III & IV B. Tech I SEM Objective Paper – Assessment

Branch: MECHANICAL ENGINEERING

Sub: Advanced Robotics

Date: 09/10/2019

Time: 30 min

Max.Marks:25

Roll No:

Invigilator signature:

I.MULTIPLE CHOICE QUESTIONS

1. Which of the following is NOT a typical application of advanced robotics? []
a) Industrial automation b) Healthcare assistance c) Agricultural farming d) Traditional manufacturing
2. What does the term "cobots" refer to in the context of advanced robotics? []
a) Robots designed for heavy lifting b) Collaborative robots designed to work alongside humans c) Robots specialized in underwater exploration d) Robots with advanced artificial intelligence
3. Which of the following is an advantage of using articulated robots in manufacturing? []
a) Limited range of motion b) High precision and flexibility c) Low initial cost d) Inability to work in confined spaces
4. What is the primary purpose of force-torque sensors in advanced robotics? []
a) Detecting temperature changes b) Measuring the speed of the robot c) Sensing contact forces and moments d) Providing visual feedback to the operator
5. Which programming language is commonly used for controlling industrial robots? []
a) Python b) C++ c) Java d) Robot-specific languages like RAPID or Karel
6. What does the term "end effector" refer to in robotics? []
a) The last link in a robotic arm b) The power source of the robot c) The programming interface of the robot d) The sensor array of the robot
7. Which type of advanced robotics is specifically designed to mimic human or animal behaviour? []
a) Industrial robots b) Autonomous robots c) Bio-inspired robots d) Teleoperated robots
8. Which of the following is a challenge in the development of humanoid robots? []
a) Limited power supply b) Lack of computational power c) Balancing and locomotion d) Inability to recognize objects
9. What is the primary function of haptic feedback systems in robotic surgery? []

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- a) Providing visual feedback to the surgeon b) Enhancing the dexterity of the robot
c) Simulating the sense of touch for the surgeon d) Controlling the robot's movement autonomously
10. Which of the following is NOT a common sensor used in advanced robotics? []
a) LiDAR b) Radar c) Lid d) Inertial Measurement Unit (IMU)
11. What is the primary purpose of a manipulator in robotics? []
a) Providing power to the robot b) Controlling the robot's movement c) Manipulating objects in the environment d) Interpreting sensor data
12. What is the main advantage of parallel robots compared to serial robots? []
a) Higher precision b) Lower cost c) Greater range of motion d) Simpler design
13. What is the primary function of machine vision systems in advanced robotics? []
a) Sensing touch and pressure b) Navigating the robot in complex environments c) Providing visual feedback and object recognition d) Controlling the robot's movement autonomously
14. Which of the following is NOT a method of locomotion for mobile robots? []
a) Wheeled b) Legged c) Hovering d) Swimming
15. What does the term "teleoperation" refer to in robotics? []
a) Controlling a robot remotely b) Programming a robot's autonomous behavior c) Simulating human-like movements in robots d) Integrating sensors into a robot's control system
16. Which of the following is a challenge in the development of swarm robotics? []
a) Limited scalability b) High cost of implementation c) Centralized control d) Robustness and coordination
17. What is the primary function of kinematic redundancy in robotics? []
a) Enhancing the robot's speed b) Providing redundant safety features c) Allowing the robot to adapt to unforeseen obstacles d) Increasing the robot's range of motion and flexibility
18. Which of the following is a common application of underwater robotics? []
a) Agriculture b) Mining c) Space exploration d) Oil and gas exploration
19. What is the primary purpose of a sensor fusion system in robotics? []
a) Combining data from multiple sensors for better accuracy b) Reducing the number of sensors used in the robot c) Enhancing the robot's processing speed d) Controlling the robot's movement autonomously
20. What is the main advantage of soft robotics over traditional rigid robotics? []
a) Higher precision b) Lower cost c) Ability to handle delicate objects and interact safely with humans d) Greater speed

Done

21. Which of the following is NOT a common use of drones in advanced robotics? []

- a) Surveillance b) Package delivery c) Agricultural spraying d) Deep-sea exploration

22. What is the primary purpose of impedance control in robotics? []

- a) Regulating the robot's power supply b) Adjusting the robot's compliance in interactions with the environment c) Improving the robot's accuracy in movement d) Enhancing the robot's visual feedback

23. Which of the following is a typical challenge in development of exoskeletons? []

- a) Limited battery life b) Lack of structural stability c) Inability to provide assistance to the user d) Difficulty in controlling the user's movements

24. What is the primary function of a gripper in robotics? []

- a) Providing power to the robot b) Controlling the robot's movement c) Manipulating objects in the environment d) Interpreting sensor data

25. Which of the following is a consideration in development of autonomous robots? []

- a) Lack of computational power b) Limited sensor capabilities c) Safety and reliability d) Dependence on human operators

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G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY: KURNOOL (Autonomous)

Department of Mechanical Engineering

The following is the list of the students who have attended Add on Course on “Advanced Robotics”

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46	16AT1A0350	K VISWANATH REDDY	19
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60	17AT5A0313	KAMMARI SAI KUMAR	17
61	17AT5A0314	SHAIK SHAIKSHAVALI	8
62	17AT5A0315	SAYYED MURTHUJAVALI	20

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