



**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**  
**DEPARTMENT OF PRODUCTION ENGINEERING**

<b>COURSE OUTLINE</b>			
Name of the programme and specialization	M.Tech. (Manufacturing Technology)		
Course Title	AUTOMATION & CIM LAB		
Course Code	PR609	No. of Credits	02
Department	PRODUCTION ENGINEERING	FACULTY	Dr. K.PANNEERSELVAM
Pre-requisites Courses	-		
Course Coordinator(s) (IF APPLICABLE)	-		
Other course TEACHER(S) /TUTOR(S) Email	kps@nitt.edu	Telephone No	0431-2503515
Course Type	<input type="checkbox"/> Core Course <input type="checkbox"/> Elective Course <input checked="" type="checkbox"/> Laboratory Course		
<b>COURSE OVERVIEW</b>			
<p>This lab course is to teach the advances in CNC programming, Hydraulic , Pneumatic , Electro-Pneumatic , Electro-Hydraulic and PLC system automation in such a way that the students can understand and use it in practical applications.</p>			
<b>COURSE OBJECTIVES</b>			
<ol style="list-style-type: none"> <li>1. Understand and apply the CNC Programming in manufacturing.</li> <li>2. Understand and Construct the Hydraulic &amp; Electro-Hydraulic circuit for Industrial Automation.</li> <li>3. Understand and Construct the Pneumatic &amp; Electro-Pneumatic circuit for Industrial Automation.</li> <li>4. Understand and Apply the PLC system for Industrial Automation.</li> </ol>			



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**MAPPING OF COs with POs**

**COURSE OUTCOMES**

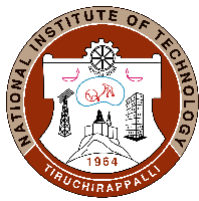
- CO1. Apply the CNC Programming in manufacturing.  
 CO2. Apply the Hydraulic & Electro-Hydraulic circuit for Industrial Automation.  
 CO3. Apply Pneumatic & Electro-Pneumatic circuit for Industrial Automation.  
 CO4. Apply the PLC system for Industrial Automation.

**Aligned Program Outcomes (PO)**

COURSE OUTCOMES	Program Outcomes (PO)										
	1	2	3	4	5	6	7	8	9	10	11
CO1	√	√	√	√	√	√	√	√			
CO2	√	√	√	√	√	√	√	√			
CO3	√	√	√	√	√	√	√	√	√	√	
CO4	√	√	√	√	√	√	√	√	√	√	

**PROGRAMME OUTCOMES (POs)**

Sl. No	Attributes	Programme Outcomes (POs): On successful completion of the programme the students will be able to
1.	Scholarship of Knowledge	Acquire in depth knowledge in Manufacturing technology with an ability to define, evaluate, analysis and synthesize existing and new knowledge.
2.	Critical Thinking	Analyze problems critically; apply independent judgment for synthesizing information to make intellectual and/or creative advances for conducting research.
3.	Problem Solving	Conceptualize and solve Manufacturing engineering problems and evaluate optimal solutions considering economic and eco-friendly factors
4.	Research Skill	Develop scientific/ technological knowledge in Manufacturing engineering through literature survey and design of experiments.
5.	Usage of modern tools	Apply of IT tools such as CAD/CAE/CAM for modeling and simulation of complex Manufacturing processes.
6.	Collaborative and multi-disciplinary work	Perform collaborate multidisciplinary scientific Manufacturing engineering research through self-management and team work.
7.	Project Management and Finance	Demonstrate knowledge and understanding of Manufacturing engineering and management and apply the same to one's own work, as a member and leader in team, manage projects efficiently in respective disciplines and multidisciplinary environments after consideration of economic and financial factors.
8.	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.
9.	Life-long 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.
10.	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.
11.	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.



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**COURSE TEACHING AND LEARNING ACTIVITIES**

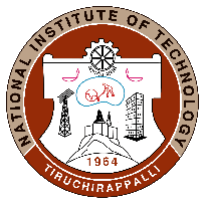
S.No	Week	Experiment	Mode of Delivery
1.	Week:1	Course plan details and Moodle registration	C&T / PPT
2.	Week:2	Exercise-1. Study on Hydraulic System Circuit's Design and Analysis	Theoretical, practical and Moodle
3.	Week:3	Exercise-2. Hydraulic system circuit simulation using FluidSIM h-1	Theoretical, practical and Moodle
4.	Week:4	Exercise-3. Hydraulic system circuit simulation using FluidSIM h-2	Theoretical, practical and Moodle
5.	Week:5	Exercise-4. Pneumatic system circuit simulation using FluidSIM p-1	Theoretical, practical and Moodle
6.	Week:6	Exercise-5. Pneumatic system circuit simulation using FluidSIM p-2	Theoretical, practical and Moodle
7.	Week:7	Buffer lab Class-1*	Theoretical, practical and Moodle
8.	Week:8	Exercise-6. Sinumerik control CNC machine Programming (turning)-1	Theoretical, practical and Moodle
9.	Week:9	Exercise-7. Sinumerik control CNC machine Programming (turning)-2	Theoretical, practical and Moodle
10.	Week:10	Exercise-8. Sinumerik control CNC machine Programming (milling)-1	Theoretical, practical and Moodle
11.	Week:11	Exercise-9. Sinumerik control CNC machine Programming (milling)-2	Theoretical, practical and Moodle
12.	Week:12	Exercise-10. Fanuc control CNC machine programming (milling and turning)	Theoretical, practical and Moodle
13.	Week:13	Buffer lab Class-2*	Theoretical, practical and Moodle
14.	Week:14	Final Exam using moodle	Using Moodle

**COURSE ASSESSMENT METHODS**

S.No.	MODE OF ASSESSMENT	WEEK/DATE	DURATION	% WEIGHTAGE
1.	Laboratory Report submission and Viva voce questions using Hard copy/Moodles for each Experiment.	-	120 Minutes	70%
2.	Final Exam using moodles	-	60 Minutes	30%

**Important Note:**

- All students are expected to attend all the laboratory sessions.
- Students who are absent for the regular laboratory session are allowed to do the experiment only in the buffer lab class\* with 50% weightage of the particular experiment.
- Relative Grading with a passing minimum is as per our institute norms.



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### ESSENTIAL READINGS

#### References:

1. CNC and Automation & CIM Lab manual

### COURSE EXIT SURVEY

Mention the ways in which the feedback about the course is assessed and indicate the attainment also:

- Feedback from the students during class committee meetings
- Anonymous feedback through questionnaire (Mid of the semester & End of the semester)

#### **MODE OF CORRESPONDENCE (email/ phone etc.)**

1. All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes schedule of assessment course material any other information regarding this course) will be done through their webmail only.
2. Queries (if required) may be emailed to me / contact me on Monday and Friday with prior intimation for any clarifications.

#### **ATTENDANCE POLICY** (A uniform attendance policy as specified below shall be followed)

Attendance will be taken by the course faculty in all the contact hours.

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

#### **ACADEMIC HONESTY & PLAGIARISM**

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

### ADDITIONAL COURSE INFORMATION

The faculty is available for consultation at times as per the intimation given by the faculty.

Queries may also be emailed to the Course Faculty directly at [kps@nitt.edu](mailto:kps@nitt.edu)

### FOR APPROVAL

  
Course Faculty

  
CC Chairperson

  
HOD