DEPARTMENT OF PRODUCTION ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Programme and specialization	**M Tech Manufacturing Technology**		
Course Title	**Advanced Tooling and Automated Inspection**		
Course Code	**PR604**	**No. of Credits**	**04**
Pre-requisite subject(s)	**REFER Curriculum**		
Session	**Jan 2021**	**Section**	
Name of Faculty	**Dr S Kumanan**	**Department**	**Production**
Email	**kumanan@nitt.edu**	**Telephone No.**	**0431 2503507**
Course Type	/ **Core course**	☐ **Elective course**	

COURSE OVERVIEW

https://www.nitt.edu/home/academics/curriculum/M.Tech-PR-MT-2020-v2.pdf page 8

COURSE TEACHING AND LEARNING ACTIVITIES (Refer page 2)

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week	Duration	% Weightage
1	Cycle Test I		1 hour	20
2	Cycle Test ii		1 hour	20
3	Class Assignment	Every Week		30
CPA	Compensation Assessment*		1 hour	--
4	Final Assessment *			30

COURSE EXIT SURVEY FEED BACK FORM

MODE OF CORRESPONDENCE Class and office in person
COMPENSATION ASSESSMENT POLICY Only on Medical Grounds with prior intimation

ATTENDANCE POLICY As Per Institute Norms

COURSE OUTCOMES:

- State of Art in Tooling in Manufacturing and Inspection
- Design and Develop tooling for modern manufacturing
- Design and Develop Automated Inspection Systems

Course details web link:

https://www.nitt.edu/home/academics/curriculum/M.Tech-PR-MT-2020-v2.pdf page 8

Course Faculty	CC-Chairperson	HOD
Dr. S. KUMANAN	Dr. V. SENTHILKUMAR	Dr. R.JEYAPAUL

PR604 Advanced Tooling and Automated Inspection

COURSE OBJECTIVES:

- To train students in state of art of Tooling in Manufacturing
- Design and Develop flexible tooling for Manufacturing
- Design and Develop automated inspection systems

LESSON PLAN

- Introduction to Principles of Tooling in Manufacturing
- Soft and Hard Automation
- Economics of Tooling
- Pre -Design Product and Process Analysis jigs and fixtures
- Tooling for Machining
- Tool Changers-Tool Presets-Flexible Tooling
- Tooling for Forming
- Evolution of Dies, Forging, Bending and Drawing and Extrusion Processes
- Tooling for Casting Processes Mechanization
- Tooling in Non Traditional Manufacturing
- Tooling for Micro Manufacturing
- Tooling for Physical and Mechanical Joining Processes
- Tooling for CMM
- Principles of Gauging
- New concepts for gaging, inspection, checking,
- Machine vision, and robotic testing.
- Smart Inspection Systems
- Techniques and Applications of Intelligent Vision
- Stages of automated visual inspection (AVI) and "smart" inspection systems
- AVI process, from illumination, image enhancement, segmentation and
- feature extraction, through to classification.

Tooling Practices

- Work and tool holding Traditional and Non-traditional Machining
- Work and tool holding Machining Centers and Turning centers,
- Tooling for Micromachining,
- Mechatronics AS/RS, Robots
- Tooling for CMM

REFERENCES:

1. Fundamentals of Tool Design, Fifth Edition Society of Manufacturing Engineers, 2003
2. Mikell P Groover Fundamentals of Modern Manufacturing: Materials, Processes, and Systems John Wiley and Sons 2012
3. Stanley L. Robinson, Richard Kendall Miller Automated Inspection and Quality Assurance 1989 CRC Press
4. Duc T. Pham and R J Alcock Smart Inspection Systems: Techniques and Applications of Intelligent Vision Academic Press