SWARNANDHRA
COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by
NAAC with "A" Grade - 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956,
Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada
Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF MECHANICAL ENGINEERING
TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
20RB4T01	FUNDAMENTALS OF CNC MACHINES	IV	Mechanical Engineering	6	2021-22	14-03-2022

COURSE OUTCOMES

1	Explain the constructional features of the CNC Machine Tool.[K2]
2	Illustrate the various types of Accessories and Feedback devices used in CNC Machine.[K3]
3	Explain the working of Position Transducer as well as control systems and Interface.[K3]
4	Illustrate the Automatically Programming Tool language and develop a program on different examples.[K3]
5	Explain the CNC Programming tools and develop a program on different examples.[K3]

UNIT	Out Comes / Bloom's Level		Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	CO1: Explain the constructional features of the CNC Machine Tool.[K2]		**Topics No. 1. Introduction to CNC Machine tools**			
		1.1	Evolution of Computerized control in manufacturing	T1	1	Chalk & Talk
		1.2	Components of CNC Machine	T1,R1	2	
		1.3	Working principle of CNC	T1	1	
		1.4	Working principle of DNC and Machining centers.	T1,T2	2	
			Total		06	
II	CO2: Illustrate the various types of Accessories and Feedback devices used in CNC Machine.[K3]		**2. Accessories**			
		2.1	CNC Accessories: Work tables, Spindles,	T1	2	Chalk & Talk, PPT.
		2.2	Spindle heads, Beds and Columns	T1	2	
		2.3	Tooling – Automatic Tool changer (ATC).	T1	2	
		2.4	Introduction of Feedback devices	T1	1	
		2.5	Digital incremental displacement measuring systems	T1	2	
		2.6	Incremental rotary encoders, Digital absolute measuring system.	T1	2	
			Total		11	

Unit	CO		No.	Topic	Ref	Hrs	Methodology
III	CO3: Explain the working of Position Transducer as well as control systems and Interface. [K3]			**3. Electro-magnetic analogue position transducers**			
			3.1	Analog Transducers: Principles, advantages, characteristics,	T1	2	
			3.2	Synchros, Synchro-Resolvers,	T1,T2	2	
			3.3	Inductos, Laser interferometer.	T1,T2	2	Chalk & Talk, PPT, Flipped Class room, Seminar.
			34	**Control Systems and Interface:** Open loop and closed loop systems,	T1,T2	2	
			3.5	Microprocessor based CNC systems, block diagram of typical CNC system	T1,T2	2	
			3.6	Description of hardware and software interpolation systems,	T1,R1	2	
			3.7	Standard and optional features of CNC control systems.	T1,T2	2	
				Total		14	
IV	CO4: Illustrate the Automatically Programming Tool language and develop a program on different examples. [K3]			**4. APT programming**			
			4.1	APT language structure, APT geometry,	T1,T2	2	
			4.2	Definition of point, time, vector, circle, plane, patterns and matrices.	T1,T2	6	
			4.3	**APT motion commands:** setup commands, point-to point motion commands,	T1,T2	3	Chalk & Talk, PPT, Seminar.
			4.4	continuous path motion commands	T1,T2,R2	2	
			4.5	post processor commands, control commands,	T1,T2	2	
			4.6	Macro subroutines, Part programming preparation for typical examples	T1,T2	2	
				Total		17	
V	CO5: Explain the CNC Programming tools and develop a program on different examples. [K3]			**5. CNC Programming**			
			5.1	Part programming fundamentals	T1, T3	2	
			5.2	Preparatory functions, Miscellaneous functions,	T1, T3	2	Chalk & Talk, PPT, Students Seminars.
			5.3	Programming number, Canned cycles, Tool length compensation	T1, T3	3	
			5.4	Cutter Radius compensation,	T1, T3	2	

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		5.5	acceptance sampling plan	T1, T3	2	
		5.6	Introduction to Total Quality Management	T1, T3	1	
		5.7	Quality Circles, ISO 9000 series procedures	T1, T3	2	
				Total	12	
			CUMULATIVE PROPOSED PERIODS		64	

Text Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
T1	1. Kumar Pravin, Industrial Engineering and Management, 2nd edition, Pearson India, 2015.
T2	2. S.C. Sharma, T.R. Banga, Industrial Engineering and Management, 1st edition, Khanna publishing house, India, 2019.

Reference Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
R1	Kaushik Kumar, Divya Zindani, Industrial Engineering and Management, 1st edition, I.K.International pvt.ltd, 2021.
R2	O. P. Khanna, Industrial Engineering and Management, Revised edition, Dhanpat Rai Publications, 2018.
R3	"Industrial Engineering and Management" by C.Nadha Muni Reddy, New Age International Publishers, 2002.

Web Details

1	Principle of Industrial Engineering- IIT Roorkee, https://youtu.be/yhywrCChJBQ
2	https://ftp.idu.ac.id/wp-content/uploads/ebook/ip/BUKU%20INDUSTRIAL%20ENGINEERING/Industrial%20Engineering%20and%20Management%20(%20PDFDrive%20).pdf
3	https://youtu.be/goci9lRmNtU

		Name	Signature with Date
i.	Faculty	Abdul Azeez	
ii.	Faculty II (for common Course)	-NA-	
iii.	Faculty III (for common Course)	-NA-	
iv.	Course Coordinator	Abdul Azeez	
v.	Module Coordinator	Dr.R.Sanjeev Kumar	
vi.	Programme Coordinator	Dr. A. Gopi chand	

Principal