Value Added Course

MECHVAC2101-Design of Experiments

T.J.S ENGINEERING COLLEGE

Approved by AICTE, New Delhi&Affiliatedwith Anna University, Chennai.
Accrediated by NAAC/ISO9001:2015 Certified Institution
TJS Nagar, Peruvoyal, Near Kavaraipettai, GummidipoondiTaluk, Thiruvallur District -601206

27.12.2021

From

Dr. K. Kamal Babu,

Head of The Department,

Department of Mechanical Engineering,

T.J.S. Engineering College,

Peruvoyal, Kavaripettai

Gummidipoondi Taluk, Thiruvallur District , TN-601206.

To

The Principal,

T.J.S. Engineering College,

Peruvoyal, Kavaripettai

Gummidipoondi Taluk, Thiruvallur District , TN-601206.

Respected Sir,

Sub : Permission to offer value added course on Design of Experiments – Reg.

I wish to inform you that, we have planned to conduct value added course on **"MECHVAC2101- Design of Experiments"** for B.E IV Year Mechanical Engineering Students from 03.01.2022 to 07.01.2022. In this regard, we are requesting you to grant permission to the above value added course.

Thanking You

Your Sincerely,

(Dr. K. Kamal Babu)

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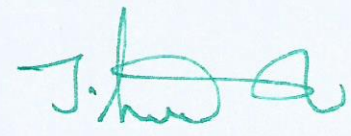
Otabu

27.12.2021

CIRCULAR

It is hereby informed that Department of Mechanical Engineering is planning to conduct a Value added Course on **"MECHVAC2101- Design of Experiments"** from **03.01.2022** to **07.01.2022** in TJSEC Seminar Hall for IV Year Mechanical Engineering Students Shri.K.V.Ramanan, General Manager, CTRI, Western Thomson Pvt Ltd., Gummidipoondi at 9.00 a.m. Hence all the Heads of the departments, faculty members and students are requested to attend the programme.

Principal

Copy to

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2. All HOD's (to circulate among their staff members & students)

3. Library

4. Notice Board

5. File

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Department of Mechanical Engineering

and

Western Thomson (India) Limited

(CT Research Institute, Training Wing of Western Thomson India)

Jointly Organizes

Value Added Course on

"MECHVAC2101-DESIGN OF EXPERIMENTS"

(5 days Program from 03.01.2022 to 07.01.2022)

Resource Person

K.V.RAMANAN

General Manager - Western Thomson India Ltd.,
Six Sigma -Master Black Belt Course
Director

Venue : Seminar Hall, TJSEC
Time : 9.00 am

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2101 - Design of Experiments
Date: 03.01.2022 to 07.01.2022
SYLLABUS

COURSE OBJECTIVE :

1. Design of experiments (DOE) is a structured methodology to optimize product and process designs.
2. Design of Experiments is viewed as a quality technology to achieve product excellence at lowest possible overall cost.
3. The effective use of sound statistical based experimental design methodology can lead to products that are easier to manufacture, have higher reliability and have enhanced field performance

MODULE 1: Introduction to DOE

Experimental design -Single factor experimentation -Factorial notation-Controllable & Response variablesPlanning for DOE-Interactions

MODULE 2: DOE Design

Full factorial & Fractional factorial designs-Confounding-Resolution-Repeats and Replicates-Randomization & Blocking

MODULE 3: DOE Analysis

Practical, Graphical and Analytical approaches-Main effects and Interaction effects-Diagnostic plots Multiple regression model-Response optimization-Using MiniTab for Analysis and optimization

MODULE 4: Case study presentations

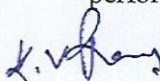Work Practice-Case Studies Analysis and optimization
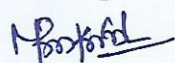
MODULE 5: Taguchi Methods

Robustness & Noise-Parameter design-Orthogonal Arrays-Signal to Noise Ratio (S/N)-Optimization-Exercise on Minitab
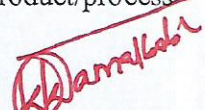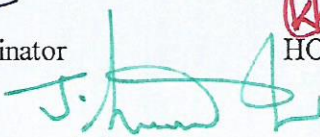
Course Outcome:

By the end of this Value added course, participants will be able:
- To design & conduct experiments and analyze & optimize product/process performance using sound statistical techniques.

Resource Person   Course Coordinator   HOD/MECH

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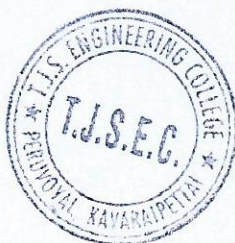
Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2101 - Design of Experiments
Date: 03.01.2022 to 07.01.2022
Course Schedule:

Day & Date	Session	Topics to be Covered	Speaker Name
Day1 & 03.01.22	9.00 am to 1.00 pm	Experimental design -Single factor experimentation -Factorial notation	Shri.K.V.Ramanan, General Manager, CTRI, Western Thomson Pvt Ltd., Gummidipoondi
	1.30 pm to 4.30 pm	Controllable & Response variablesPlanning for DOE-Interactions	Mr.M.Prakash Assistant Professor/MECH/TJSEC
Day2 & 04.01.22	9.00 am to 1.00 pm	Full factorial & Fractional factorial designs-Confounding-Resolution	Shri.K.V.Ramanan, General Manager, CTRI, Western Thomson Pvt Ltd., Gummidipoondi
	1.30 pm to 4.30 pm	Repeats and Replicates-Randomization & Blocking	Mr.M.Prakash Assistant Professor/MECH/TJSEC
Day3 & 05.01.22	9.00 am to 1.00 pm	Practical, Graphical and Analytical approaches-Main effects and Interaction effects-Diagnostic plots	Shri.K.V.Ramanan, General Manager, CTRI, Western Thomson Pvt Ltd., Gummidipoondi
	1.30 pm to 4.30 pm	Multiple regression model-Response optimization-Using MiniTab for Analysis and optimization	Mr.M.Prakash Assistant Professor/MECH/TJSEC
Day4 & 06.01.22	9.00 am to 1.00 pm	Work Practice	Shri.K.V.Ramanan, General Manager, CTRI, Western Thomson Pvt Ltd., Gummidipoondi
	1.30 pm to 4.30 pm	Case Studies Analysis and optimization	Shri.K.V.Ramanan, General Manager, CTRI, Western Thomson Pvt Ltd., Gummidipoondi
Day5 & 07.01.22	9.00 am to 1.00 pm	Robustness & Noise-Parameter design-Orthogonal Arrays	Shri.K.V.Ramanan, General Manager, CTRI, Western Thomson Pvt Ltd., Gummidipoondi
	1.30 pm to 4.30 pm	Signal to Noise Ratio (S/N)-Optimization-Exercise on Minitab	Shri.K.V.Ramanan, General Manager, CTRI, Western Thomson Pvt Ltd., Gummidipoondi

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Department of Mechanical Engineering Academic Year 2021-2022

Value Added Course - MECHVAC2101 - Design of Experiments

Date: 03.01.2022 to 07.01.2022

LIST OF PARTICIPANTS

TOTAL NUMBER OF STUDENTS: 53

IV MECH

S. No	Reg. No	Student Name
1	112818114001	ABINESH V
2	112818114002	AKASH B
3	112818114003	AKASH S
4	112818114004	ASWIN P V
5	112818114005	ATHIQHUR RAHMAN M
6	112818114006	BALA MURUGAN S
7	112818114007	BODILINGALAPADU VASANTH
8	112818114008	CHATTU GUNAKAR
9	112818114009	CHITTIBOINA MURALI KRISHNA
10	112818114010	DINESH P
11	112818114012	GOPINATH S
12	112818114013	HAYATH BASHA K
13	112818114014	JANARTHAN S
14	112818114016	JIBIN JOSE K
15	112818114018	KAMARAJ B
16	112818114019	KANDERI NAVEEN
17	112818114020	KARTHIKEYAN R
18	112818114021	KATURU BHUVAN CHANDU
19	112818114022	KRISHNA BHARATHI H
20	112818114023	KUMARA GURU G
21	112818114024	KUPPAN M
22	112818114025	LOGESH R
23	112818114026	MOHANA PRASATH S
24	112818114027	MOHENDAR D
25	112818114028	MOULI CHANDRU D
26	112818114029	NAGARAJ V
27	112818114031	PAVAN KUMAR S
28	112818114032	PRABAKARAN S
29	112818114033	PURUSOTHAMAN M
30	112818114034	RAGHUL R

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31	112818114035	RAJESH P
32	112818114036	RIYAZ KHAN K
33	112818114037	SADU VENKATESH
34	112818114038	SAI KRISHNAN K B
35	112818114039	SAI KUMAR G R
36	112818114040	SHARAN P
37	112818114041	SNEGA K
38	112818114042	SUNDHARESAN L
39	112818114043	SUNIL RAJ J
40	112818114045	TAMIL PRIYAN C
41	112818114046	VASANTHRAJ P
42	112818114047	VIGNESH KUMAR S
43	112818114048	VIJAYAKUMAR P
44	112818114301	AMASA NANDA KUMAR
45	112818114302	BHUVANESHWARAN S
46	112818114303	PAVAN KUMAR R
47	112818114304	SUBASH S
48	112818114305	UMESH R
49	112818114306	VAIDEESHWARAN M
50	112818114307	VISHNURAM R
51	112818114501	RAJESH P
52	112818114701	MOHAMMED ALTHAF M
53	112818114702	RAHUL S

Courser-Coordinator

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2101 - Design of Experiments
Date: 03.01.2022 to 07.01.2022
Resource Person Profile

Resource Person1:

Name	:	Mr. K.V.Ramanan
Designation	:	General Manager
Department	:	Mechanical Engineering
Organization	:	Western Thomson India Ltd.
Phone Number	:	+91 9962055025
Email ID	:	ramanan@westernthomsonindia.com
Qualification	:	Masters in Engineering
Experience	:	20 years
Specialization	:	Production Engineering & Six Sigma Master Black Belt
Address	:	Sipcot industrial Area, B18, Gummidipoondi, Tamil Nadu 601201

Resource Person 2:

Name	:	Mr.M.Prakash
Designation	:	Assistant Professor
Department	:	Mechanical Engneering
Organization	:	TJS Engineering College
Phone Number	:	+91 9840132371
Email ID	:	serc2008@gmail.com
Qualification	:	Masters in Engineering
Experience	:	12 Years
Specialization	:	Manufacturing
Address	:	Plot NO.17, Sabari Garden, Pethikuppam Gummidipoondi, Thiruvallur – District. Pin 601 201

Course-Coordinator

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Department of Mechanical Engineering Academic Year 2021-2022

Value Added Course - MECHVAC2101 - Design of Experiments

Date: 03.01.2022 to 07.01.2022

Assessment Questions

Name: Marks: 20

Year:

Date:

1. Which of these does not come into the general model of a process?
   a) Input
   b) Controllable input factors
   c) Uncontrollable inputs factors
   d) Acceptance sampling

2. The uncontrollable factors are the factor _____
   a) That varies according to a normal distribution
   b) That does not vary at all
   c) That can be controlled by the user
   d) That cannot be changed according to the wish of the user

3. Which of these steps are not conducted when the design of experiment procedure is adopted?
   a) Determining which variable is most influential to output
   b) Determining where to set the influential controllable factors so that output is near the nominal requirement
   c) Deleting the uncontrollable factors
   d) Determining where to set the influential controllable inputs so that the variability in the output is smallest

4. Which of these can be used to develop a new process?
   a) Design of experiments
   b) Acceptance sampling
   c) Control charts
   d) Histogram

5. The design of the experiment is used to determine the variables which are _____ affecting the state of the process.
   a) The most
   b) The least
   c) Not
   d) Not changing

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6. The designed experiments are the part of _____ step of DMAIC process.
   a) Define
   b) Measure
   c) Analyze
   d) Control

7. Experimental design methods are not used _____
   a) Evaluating the process capability
   b) In process development
   c) In process troubleshooting to improve process performance
   d) To obtain a process that is robust and insensitive to external sources of variability

8. How many runs does a full factorial 2 factors 3 levels experiment consist of?
   a) 6
   b) 81
   c) 8
   d) 9

9. In the equation $Y = f(X)$, the terms X and Y are respectively:?
   a) Dependent variable, Independent variables
   b) Output, Inputs
   c) Factors, Response
   d) Response, Factors

10. The lowest design resolution in which main effects are not confounded with any other maineffect is called:
    a) Resolution VI design
    b) Resolution V design
    c) Resolution IV design
    d) Resolution III design

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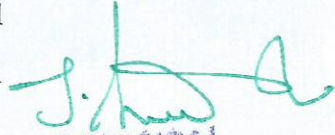Approved by AICTE, New Delhi&Affiliatedwith Anna University, Chennai.
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11. Why do we perform experiments in a random order?
   a) To maximize the effect of unknown variables including environmental factors

   b) To minimize the effect of unknown variables

   c) To enhance the factor interactions

   d) To separate the main effects from interaction

12. _____ occurs when the effect of one factor on a response depends on the level ofanother factor(s).
   a) Error

   b) Interaction

   c) Replication

   d) Randomization

13. A controlled independent variable whose levels are set by the experimenter is called:
   a) Level

   b) Treatment

   c) Factor

   d) Response

14. Performing the same treatment combination more than once is called:
   a) Recitation

   b) Replication

   c) Randomization

   d) Repatriation

15. Analysis of variance is used to test?
   a) Means of three or more populations

   b) Variance of three or more populations

   c) Difference between 2 means

   d) Difference between 2 variances

16. In one-way ANOVA, the caluclated F value is less than the table F value then?
   a) Accept the hypothesis that the population means are equal

   b) Reject the hypothesis that the population means are equal

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c) Sometimes accept and sometimes reject the null hypothesis

d) All of the above

17. In one-way ANOVA, with usual notation, the error degree of freedom is?
    a) $n - 1$

    b) $n - k$

    c) $k - 1$

    d) $k - n$

18. In two-way ANOVA with m rows and n columns, the error degrees of freedom is?
    a) $m - 1$

    b) $(n - 1)\,m$

    c) $(m - 1)\,n$

    d) $(m - 1)\,(n - 1)$

19. The assumption used in ANOVA is
    a) The population from which the samples were obtained must be normally distributed
    b) The samples must be independent
    c) The variances of the population must be equal
    d) All of the above

20. raeco-Latin design allows for _____ blocking factors?
    a) Three

    b) Two

    c) One

    d) No

Course Coordinator

HOD

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Department of Mechanical Engineering Academic Year 2021-2022

Value Added Course - MECHVAC2101 - Design of Experiments

Date: 03.01.2022 to 07.01.2022

Assessment Questions

Name: K. Snegha

Year: IV

Date: 07.01.22

18/20

Marks: 20

1. Which of these does not come into the general model of a process?
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8. How many runs does a full factorial 2 factors 3 levels experiment consist of?
   a) 6
   b) 81
   c) 8
   d) 9

9. In the equation $Y = f(X)$, the terms X and Y are respectively:?
   a) Dependent variable, Independent variables
   b) Output, Inputs
   c) Factors, Response
   d) Response, Factors

10. The lowest design resolution in which main effects are not confounded with any other maineffect is called:
    a) Resolution VI design
    b) Resolution V design
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11. Why do we perform experiments in a random order?
   a) To maximize the effect of unknown variables including environmental factors
   b) To minimize the effect of unknown variables ✓
   c) To enhance the factor interactions
   d) To separate the main effects from interaction

12. _____ occurs when the effect of one factor on a response depends on the level ofanother factor(s).
   a) Error
   b) Interaction ✓
   c) Replication
   d) Randomization

13. A controlled independent variable whose levels are set by the experimenter is called:
   a) Level
   b) Treatment
   c) Factor
   d) Response ✓

14. Performing the same treatment combination more than once is called:
   a) Recitation
   b) Replication
   c) Randomization
   d) Repatriation ✓

15. Analysis of variance is used to test?
   a) Means of three or more populations
   b) Variance of three or more populations
   c) Difference between 2 means ✓
   d) Difference between 2 variances

16. In one-way ANOVA, the caluclated F value is less than the table F value then?
   a) Accept the hypothesis that the population means are equal
   b) Reject the hypothesis that the population means are equal

c) Sometimes accept and sometimes reject the null hypothesis

d) All of the above

17. In one-way ANOVA, with usual notation, the error degree of freedom is?

   a)n – 1

   b)n – k

   c)k – 1

   d)k – n

18. In two-way ANOVA with m rows and n columns, the error degrees of freedom is?

   a)m – 1

   b)(n – 1) m

   c)(m – 1) n

   d)(m – 1) (n – 1)

19. The assumption used in ANOVA is
   a) The population from which the samples were obtained must be normally distributed
   b) The samples must be independent
   c) The variances of the population must be equal
   d) All of the above
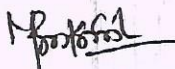
20. Raeco-Latin design allows for _____ blocking factors?
   a) Three

   b) Two

   c) One

   d) No

Course Coordinator

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2101 - Design of Experiments
Date: 03.01.2022 to 07.01.2022
LIST OF PARTICIPANTS
TOTAL NUMBER OF STUDENTS: 53

<u>IV MECH</u>

S. No	Reg. No	Student Name	Marks(20)	Marks(100)
1	112818114001	ABINESH V	18	90
2	112818114002	AKASH B	20	100
3	112818114003	AKASH S	18	90
4	112818114004	ASWIN P V	19	95
5	112818114005	ATHIQHUR RAHMAN M	20	100
6	112818114006	BALA MURUGAN S	20	90
7	112818114007	BODILINGALAPADU VASANTH	19	95
8	112818114008	CHATTU GUNAKAR	18	90
9	112818114009	CHITTIBOINA MURALI KRISHNA	19	95
10	112818114010	DINESH P	20	95
11	112818114012	GOPINATH S	20	90
12	112818114013	HAYATH BASHA K	20	100
13	112818114014	JANARTHAN S	19	95
14	112818114016	JIBIN JOSE K	19	95
15	112818114018	KAMARAJ B	19	95
16	112818114019	KANDERI NAVEEN	20	100
17	112818114020	KARTHIKEYAN R	20	90
18	112818114021	KATURU BHUVAN CHANDU	20	95
19	112818114022	KRISHNA BHARATHI H	18	90
20	112818114023	KUMARA GURU G	20	90
21	112818114024	KUPPAN M	18	90
22	112818114025	LOGESH R	19	95
23	112818114026	MOHANA PRASATH S	20	90
24	112818114027	MOHENDAR D	20	100
25	112818114028	MOULI CHANDRU D	19	95
26	112818114029	NAGARAJ V	18	90
27	112818114031	PAVAN KUMAR S	19	95
28	112818114032	PRABAKARAN S	20	90
29	112818114033	PURUSOTHAMAN M	20	95
30	112818114034	RAGHUL R	20	90
31	112818114035	RAJESH P	19	95
32	112818114036	RIYAZ KHAN K	19	95
33	112818114037	SADU VENKATESH	19	95

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34	112818114038	SAI KRISHNAN K B	20	95
35	112818114039	SAI KUMAR G R	20	90
36	112818114040	SHARAN P	20	90
37	112818114041	SNEGA K	18	90
38	112818114042	SUNDHARESAN L	20	95
39	112818114043	SUNIL RAJ J	18	90
40	112818114045	TAMIL PRIYAN C	19	95
41	112818114046	VASANTHRAJ P	20	85
42	112818114047	VIGNESH KUMAR S	20	95
43	112818114048	VIJAYAKUMAR P	19	95
44	112818114301	AMASA NANDA KUMAR	18	90
45	112818114302	BHUVANESHWARAN S	19	95
46	112818114303	PAVAN KUMAR R	20	95
47	112818114304	SUBASH S	20	95
48	112818114305	UMESH R	20	95
49	112818114306	VAIDEESHWARAN M	19	95
50	112818114307	VISHNURAM R	19	95
51	112818114501	RAJESH P	19	95
52	112818114701	MOHAMMED ALTHAF M	20	95
53	112818114702	RAHUL S	20	100

Co-coordinator

HOD

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Gummidipoondi Taluk,
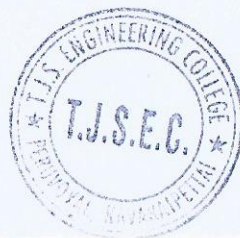Thiruvallur Dist - 601 206.

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Otabu

Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2101 - Design of Experiments
Date: 03.01.2022 to 07.01.2022
Attendance Sheet- IV MECH

S. No	Reg. No	Student Name	03.01.22	04.01.22	05.01.22	06.01.22	07.01.22
1	112818114001	ABINESH V	Abinesh.v	Abinesh v	Abinesh v	Abinesh v	Abinesh V
2	112818114002	AKASH B	Akash.B	Akash.B	Akash.B	Akash.B	Akash.B
3	112818114003	AKASH S	Akash S	Akash S	Akash.S	Akash S	Akash.S
4	112818114004	ASWIN P V	Aswin	Aswin	Aswin	Aswin	Aswin
5	112818114005	ATHIQHUR RAHMAN M	Athiqhur Rahman	Athiqhur Rahman	Athiqhur Rahman M	Athiqhur Rahman M	Athiqhur Rahman
6	112818114006	BALA MURUGAN S	Murugan	Murugan	Murugan	Murugan	Murugan
7	112818114007	BODILINGALAPADU VASANTH	Vasanth	Vasanth	Vasanth	Vasanth	Vasanth
8	112818114008	CHATTU GUNAKAR	Chattu Gunak	Chattu Gunak	Chattu Gunak	Chattu Guna	Chattu Guna
9	112818114009	CHITTIBOINA MURALI KRISHNA	Murali Krishna	Murali Krishna	Murali Krishna	Murali Krishna	Murali Krishna
10	112818114010	DINESH P	Dinesh P	Dinesh P	Dinesh P	Dinesh P	Dinesh P
11	112818114012	GOPINATH S	Gopinath	Gopinath	Gopinath	Gopinath	Gopinath
12	112818114013	HAYATH BASHA K	Hayath Basha	Hayath Basha	Hayath Basha	Hayath Basha	Hayath Basha
13	112818114014	JANARTHAN S	Janarthanan	Janarthanan	Jhanarthanan	Janarthanan	Janarthanan
14	112818114016	JIBIN JOSE K	JIBIN JOSE K	JIBIN JOSE K	JIBIN JOSE K	JIBIN JOSE K	JIBIN JOSE K
15	112818114018	KAMARAJ B	Kamaraj.B	Kamaraj.B	Kamaraj B	Kamaraj.B	Kamaraj.B
16	112818114019	KANDERI NAVEEN	kanderi	kanderi	kanderi	kanderi	kanderi
17	112818114020	KARTHIKEYAN R	Karthikeyan	Karthikeyan	Karthikeyan	Karthikeyan	Karthikeyan
18	112818114021	KATURU BHUVAN CHANDU	katuru Bhuva	katuru bhuvan	katuru bhuvan	katuru buvan	katuru bu
19	112818114022	KRISHNA BHARATHI H	Krishna Bharathi	Krishna bharathi	Krishna bharathi	Krishna bharathi	Krishna bharathi
20	112818114023	KUMARA GURU G	Kumara guru	Kumara guru	Kumara guru	Kumara guru	Kumara guru
21	112818114024	KUPPAN M	Kuppan.M	Kuppan.M	Kuppan.M	Kuppan M	Kuppan.M
22	112818114025	LOGESH R	Logesh	Logesh	Logesh	Logesh	Logesh
23	112818114026	MOHANA PRASATH S	Mohan.S	Mohan.S	Mohan.S	Mohan.S	Mohan.S
24	112818114027	MOHENDAR D	Mohendar	Mohendar	Mohendar	Mohendar	Mohendar
25	112818114028	MOULI CHANDRU D					
26	112818114029	NAGARAJ V	Nagaraj.V	Nagaraj.V	Nagaraj V	Nagaraj.V	Nagaraj.V
27	112818114031	PAVAN KUMAR S	Pavan Kumar	Pavan Kumar	Pavan Kumar	Pavan Kumar	Pavan Kumar

28	112818114032	PRABAKARAN S					
29	112818114033	PURUSOTHAMAN M					
30	112818114034	RAGHUL R					
31	112818114035	RAJESH P					
32	112818114036	RIYAZ KHAN K					
33	112818114037	SADU VENKATESH					
34	112818114038	SAI KRISHNAN K B					
35	112818114039	SAI KUMAR G R					
36	112818114040	SHARAN P					
37	112818114041	SNEGA K					
38	112818114042	SUNDHARESAN L					
39	112818114043	SUNIL RAJ J					
40	112818114045	TAMIL PRIYAN C					
41	112818114046	VASANTHRAJ P					
42	112818114047	VIGNESH KUMAR S					
43	112818114048	VIJAYAKUMAR P					
44	112818114301	AMASA NANDA KUMAR					
45	112818114302	BHUVANESHWARAN S					
46	112818114303	PAVAN KUMAR R					
47	112818114304	SUBASH S					
48	112818114305	UMESH R					
49	112818114306	VAIDEESHWARAN M					
50	112818114307	VISHNURAM R					
51	112818114501	RAJESH P					
52	112818114701	MOHAMMED ALTHAF M					
53	112818114702	RAHUL S					

Course Coordinator

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Department of Mechanical Engineering Academic Year 2021-2022

Value Added Course - MECHVAC2101 - Design of Experiments

Date: 03.01.2022 to 07.01.2022

TOTAL NUMBER OF STUDENTS: 53

Course Code & Name	: MECHVAC2101 - Design of Experiments
Year Offered	: IV-MECH Students
Course Coordinator	: Mr.M.Prakash
Course Type	: Industry Based
Course Outcome	:

- Students understood that Design of experiments (DOE) is a structured methodology to optimize product and process designs, to accelerate the development cycle, to reduce development costs and to effectively trouble shoot manufacturing problems.

- Students understood that Today, Design of Experiments is viewed as a quality technology to achieve product excellence at lowest possible overall cost. It has been established in many different industries including electronics, aerospace, automotive, medical, food and pharmaceuticals, and chemical and process industries.

- To design & conduct experiments and analyze & optimize product/process performance using sound statistical techniques.

No. of Students Enrolled : 53

No. of Students Appeared : 53

Date of Exam : 07.01.22

Mode of Exam : MCQ Offline

No. of Students passed : 53

Course Coordinator   **HOD/MECH**

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2101 - Design of Experiments
Date: 03.01.2022 to 07.01.2022
STUDENT FEED-BACK

NAME: Kandes Naveen

YEAR: IV

DATE: 07/01/22

1. The instructor was well prepared for class

   a. Satisfactory b. good ✓c. excellent d. poor

2. The instructor was organized and used class time efficiently

   a. ✓Yes   b. No

3. The instructor presented course material in a clear manner that facilitated understanding

   a. Satisfactory ✓b. good   c. excellent d. poor

4. This class has increased my interest in this field of study.

   ✓a. Yes   b. No

5. The reading were appropriate to the goals of the course

   a. Satisfactory b. good ✓c. excellent d. poor

6. I have put a great deal of effort into advancing my learning in this course

   ✓a. Yes   b. No

7. The grading practices were fair

   ✓a. Yes b. No

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Department of Mechanical Engineering

&

Western Thomson (India) Limited

CERTIFICATE OF APPRECIATION

This is to certify that **Mr. KANDERI NAVEEN (112818114019)** has successfully completed

Value added course on **MECHVAC2101-Design of Experiments** conducted during January 3 – 7,

2022 at **Department of Mechanical Engineering, T.J.S Engineering College.**

HOD/Convenor

PRINCIPAL

K. V. Ramanan
Western Thomson Ltd.,

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Value Added Course
MECHVAC2102-CATIAV5

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27.01.2022

From

Dr. K. Kamal Babu,

Head of The Department,

Department of Mechanical Engineering,

T.J.S. Engineering College,

Peruvoyal, Kavaripettai

Gummidipoondi Taluk, Thiruvallur District , TN-601206.

To

The Principal,

T.J.S. Engineering College,

Peruvoyal, Kavaripettai

Gummidipoondi Taluk, Thiruvallur District , TN-601206.

Respected Sir,

Sub : Permission to offer value added course on CATIA V5– Reg.

I wish to inform you that, we have planned to conduct value added course on **"MECHVAC2102- CATIA V5"** for B.E III Year Mechanical Engineering Students from 01.02.2022 to 05.02.2022. In this regard, we are requesting you to grant permission to the above value added course.

Thanking You

Your Sincerely,

(Dr. K. Kamal Babu)

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Otabu

28.01.2022

CIRCULAR

It is hereby informed that Department of Mechanical Engineering is planning to conduct a Value added Course on **"MECHVAC2102- CATIA V5"** from 01.02.2022 To 05.02.2022 in TJSEC Seminar Hall for III Year Mechanical Engineering Students by Mr. K. ArunKumar, , Director, Femlogic Technologies, Thoraipakkam(OMR), at 9.00 a.m. Hence all the Heads of the departments, faculty members and students are requested to attend the programme.

Principal

Copy to

    1. IQAC

    2. All HOD's (to circulate among their staff members & students)

    3. Library

    4. Notice Board

    5. File

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Department of Mechanical Engineering

and

Femlogic Technologies
Jointly Organizes

Value Added Course on

"MECHVAC2102-CATIA V5"

(5 days Program from 01.02.2022 to 05.02.2022)

Resource Person

Mr. K. Arun Kumar, , Director,
Femlogic Technologies,
Thoraipakkam(OMR)

Venue : Seminar Hall, TJSEC
Time : 9.00 am

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2102 – CATIA V5
Syllabus

COURSE OBJECTIVE :

The course is aimed at giving exposure to and enhancing the knowledge and skills of engineers involved in CAD package and for those who want to provide training to others in this area. It gives exposure and hands on experience in the field of CAD (Part modeling, Assembly Modeling and Drafting)

MODULE 1: INTRODUCTION

CATIA as a CAD software :- Concept of Parametric Modeling, Feature Based Modeling, User Interface, Mouse operations, File types and Management, drawing profiles. Major user industries of Catia. Why Catia is preferred.

MODULE 2: SKETCHER

Profile toolbar, operation(corner, chamfer, delimitations, transformations, project 3D element), constraints, types of constraints, workbench. sketch tools, tools(Sketch solving status, sketch analysis, output feature), visualization toolbar, user selection filter.

MODULE 3: PART MODELLING

Material Addition and Removal (Pad, Pocket, Shaft, Groove), Sketch and Positioned Sketch, Types of Fillets, Types of Chamfer, Types of Hole. Axis System, Types of draft, Shell, Stiffener, rib slot, Multisection solid, Removed multisectionsolid, Apply Material, Measure, and Render.
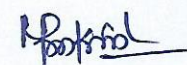
MODULE 4: DRAFTING

Introduction To Drafting & Detailing Theory:- (types Generative – Interactive), Initial Drafting setting, Sheet Background, Views (ortho, ISO), Dimensions (Types- Generate Dimension & Create Dimension). Views:- (Aux, Section, Details, Clipping, Broken), View properties, DATUMS & Tolerance Surfacing Modeling.

MODULE 5: ASSEMBLY &MECHANISM

Introduction to Assembly:- Types of assembly approach, Types of Constrains andDOF, placement of components in the Assembly, Manipulating Components, BOTTOM UP Approach Assembly Drafting:- Scene(Exploded View), Bill of material, Ballon creation,Graph Tree Reordering.
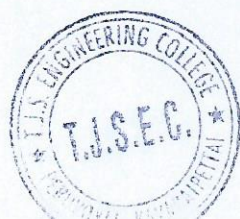
Course Outcome:
- Understand the concepts of CAD and CAD tools.
- Visualize 3D objects using 2D design data.
- Sketch of Orthogonal Projection using 3D Models
- Design and Create Part models and Assembly models
- Create Drafting from Part and Assembly Models.

Course Coordinator

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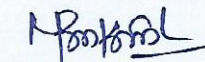**Department of Mechanical Engineering Academic Year 2021-2022**
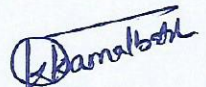**Value Added Course - MECHVAC2102 – CATIA V5**
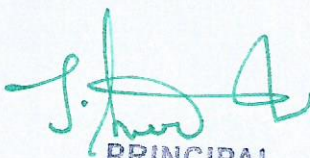**Date: 01.02.2022 to 05.02.2022**
Course Schedule:

Day & Date	Session	Topics to be Covered	Speaker Name
Day1 & 01.02.22	9.00 am to 1.00 pm	CATIA as a CAD software :- Concept of Parametric Modeling, Feature Based Modeling, User Interface, Mouse operations.	Mr. K. ArunKumar, Director, Femlogic Technologies,chennai
	1.30 pm to 4.30 pm	File types and Management, drawing profiles. Major user industries of Catia. Why Catia is preferred.	Mr. K. ArunKumar, Director, Femlogic Technologies,chennai
Day2 & 02.02.22	9.00 am to 1.00 pm	Profile toolbar, operation(corner, chamfer, delimitations, transformations, project 3D element), constraints, types of constraints, workbench	Mr. K. ArunKumar, Director, Femlogic Technologies,chennai
	1.30 pm to 4.30 pm	sketch tools, tools(Sketch solving status, sketch analysis, output feature), visualization toolbar, user selection filter.	Mr.M.VinothKumar Assistant Professor-MECH-TJSEC
Day3 & 03.02.22	9.00 am to 1.00 pm	Material Addition and Removal (Pad, Pocket,Shaft, Groove), Sketch and Positioned Sketch, Types of Fillets, Types of Chamfer, Types of Hole.	Mr. K. ArunKumar, Director, Femlogic Technologies,chennai
	1.30 pm to 4.30 pm	Axis System, Types of draft, Shell, Stiffener, rib slot, Multisection solid, Removed multisection solid, Apply Material, Measure, and Render.	Mr.M.VinothKumar Assistant Professor-MECH-TJSEC
Day4 & 04.02.22	9.00 am to 1.00 pm	Introduction To Drafting & Detailing Theory:- (types Generative – Interactive), Initial Drafting setting, Sheet Background, Views (ortho, ISO),	Mr. K. ArunKumar, Director, Femlogic Technologies,chennai
	1.30 pm to 4.30 pm	Dimensions (Types- Generate Dimension & Create Dimension). Views:- (Aux, Section, Details, Clipping, Broken), View properties, DATUMS & Tolerance Surfacing Modeling.	Mr.M.VinothKumar Assistant Professor-MECH-TJSEC
Day5 & 05.02.22	9.00 am to 1.00 pm	Introduction to Assembly:- Types of assembly approach, Types of Constrains and DOF, placement of components in the Assembly, Manipulating Components,	Mr. K. ArunKumar, Director, Femlogic Technologies,chennai
	1.30 pm to 4.30 pm	BOTTOM UP Approach Assembly Drafting:- Scene(Exploded View), Bill of material, Ballon creation,Graph Tree Reordering.	Mr. K. ArunKumar, Director, Femlogic Technologies,chennai

Resourse Person   **Course Coordinator**   **HOD**

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Department of Mechanical Engineering Academic Year 2021-2022

Value Added Course - MECHVAC2102 – CATIA V5

Date: 01.02.2022 to 05.02.2022

LIST OF PARTICIPANTS

TOTAL NUMBER OF STUDENTS: 24

III MECH

S. No	Reg. No	Student Name
1	112819114002	BALAMURUGAN K
2	112819114004	DEEPAKKUMAR KV
3	112819114005	DINESH KUMAR M
4	112819114006	DIVAKAR R
5	112819114008	HARISH S
6	112819114009	JAYAKUMAR M
7	112819114010	KISHORE KUMAR R
8	112819114011	KOWSHIK M
9	112819114012	LOGANATHAN C
10	112819114013	MOHAN PRASANTH M
11	112819114014	MURUGAN S
12	112819114015	PATANAM HEMANTH KUMAR
13	112819114016	PONVEL K
14	112819114017	RIGIVAN G
15	112819114018	SANTHOSH KUMAR S
16	112819114019	AVINASH S
17	112819114020	SHEFTON JOSEPH MURRAY
18	112819114021	SIMSOAN J
19	112819114022	SINDHU S
20	112819114023	SNEGHAR N
21	112819114024	VIJI R
22	112819114025	VISHAL M
23	112819114301	ELANGOVAN K
24	112819114302	YUVANESH K

Course-Coordinator

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2102 – CATIA V5
Date: 01.02.2022 to 05.02.2022
Resource Person Profile

Resource Person1:

Name	:	Mr. K.Arunkumar
Designation	:	Director
Department	:	Mechanical Engineering
Organization	:	Femlogic Technologies
Phone Number	:	+91 9176131866
Email ID	:	arunkumark@femlogic.in
Qualification	:	Masters in Engineering
Experience	:	12 years
Specialization	:	CAD& CAE
Address	:	3, Customs Colony, Jothi Nagar, Thoraipakkam, CH-600097

Resource Person 2:

Name	:	Mr.M.Vinoth Kumar
Designation	:	Assistant Professor
Department	:	Mechanical Engineering
Organization	:	TJS Engineering College
Phone Number	:	+91 9952199251
Email ID	:	winoth100@gmail.com
Qualification	:	Masters in Engineering
Experience	:	12 Years
Specialization	:	Manufacturing
Address	:	No. 19 New Ambedkar Street, Walajapet

Course-Coordinator

HOD

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2102 – CATIA V5
Date: 01.02.2022 to 05.02.2022
Assessment Questions

Name: **Marks: 20**

Year:

Date:

1. Basic Catia V5: A part in Catia V5 has which suffix?
   - **A. CATPart**
   - B. Model
   - C.Prt
   - D.Dwg

2. Basic Catia V5: Is "wrench-Bonn?et_string.CATPrpduct" an acceptable filename in Catia?
   - **A.True**
   - B. False

3. Basic Catia V5: If you are missing a toolbar, what do you do?
   - **A.Right-click on an icon and look for it there or check View-Toolbars**
   - B.Start a different module of Catia and look for it there
   - C. Close and start Catia again
   - D. Close the open document and open it again

4. Basic Catia V5: An assembly in Catia V5 has which suffix?
   - **A. .Model**
   - B. CATPart
   - C. Prt
   - D. CATProduct

5. Part Design: When a new plane is created, where, in the specification tree, will it appear? (It is NOT a hybrid model)
   - A. In the Geometrical Set.1 body
   - **B. In the PartBody**
   - C. Just after the zx plane

6. Part Design: What is a draft feature?
   - A. The function is often used when the part is going to be cast/forged/formed somehow with a tool
   - **B. It is a feature you can use for creating lines**
   - C. The function is often used within styling
   - D. You can create a pad with fillets with this command

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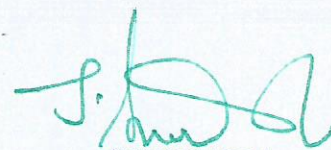Approved by AICTE, New Delhi&Affiliated with Anna University, Chennai.
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7. Part Design: The term "parametric" means that a solid geometry is controlled by driving dimensions.
- o **A. True**
- o B. False

8. Part Design: When is it a good idea to use multi-body techniques?
- o **A.For instance when designing complex and/or molded parts**
- o B. When assemble complex products
- o C. When you have many surfaces
- o D. When you need to create a drawing

9. Part Design: What is a skeleton?
- o A. Help geometry that you can use as reference
- o B. A thinwalled CATIA model
- o C. Skeleton is another name for a sketch
- o **D. Skeleton is another name for a geometrical set.**

10. Part Design: What is true about sketch-based features?
- o A. You need at least one sketch to create them
- o **B. They can only be created in the PartBody (the first body)**
- o C.It is an isolated sketch
- o D. They need a surface as parent element

11. Sketcher: When work is finished, why is it a good idea to use Sketch analysis?
- o **A.To verify that geometry in sketch is correct**
- o B. To measure geometry in sketch
- o C. To change geometry in sketch
- o D. To change color/thickness of geometry in sketch

12. Sketcher: The Sketcher workbench is a standalone workbench that allows you to save a *: CATSketch file
- o **A. True**
- o B. False

13. Drafting: How do you create your first view (Front view)?
- o **A. Pick front view icon and pick a plane in the 3D viewer, Part or Assembly**
- o B. Copy the object from assembly or part and paste it on the drawing
- o C. Pick a plane on object and right click choose in menu Front view
- o D. Drag the part or assembly into the drawing sheet

14. Drafting: How do you see which drawing view is active?
- o A. The active view has a red frame

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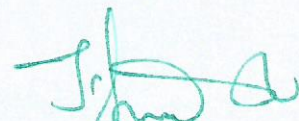Gummidipoondi Taluk,
Thiruvallur Dist - 601 206.

- B. **All views are active!**
- C. Only the active view is visible

15. Drafting: When you create an exploded view, you usually use a tool called Enhanced Scene. Why?
- A. **You can create an exploded view which doesn't affect the "master" product**
- B. You can create position balloons there
- C. You can create a Bill of material list there
- D. You can create an animated movie there

16. Drafting: In a detailed drawing, are the views dependant on the CATParts point of origin?
- A. **True**
- B. False

17. Assembly Design: When analyzing a component, Catia says it has 6 "degrees of freedom". What is the meaning of that?
- A. It means that the component is fully loose in space
- B. **It means that the component is fully fixed in space**
- C. It means that the component is not saved
- D. It means that the component is drafted with an angle of 6-degrees

18. Assembly Design: What is the name of the command that makes it possible to create an exploded view?
- A. **Enhanced Scene**
- B. 3D split
- C. Move
- D. Assembly split

19. Surface Design: When shall you use the Join command?
- A. When you want to join two or more surfaces or curves
- B. **When you want to join a solid body to a surface**
- C. When I need to connect a sketch to a surface
- D. When I want to join a point to a curve

20. Surface Design: What is an isolated element?
- A. **Element without a history, it has no relation to a parent element**
- B. Element with a fixed color
- C. Element you only use in Part Design
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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2102 – CATIA V5
Date: 01.02.2022 to 05.02.2022
Assessment Questions

Name: C. dasanathan

Year: JM

Date: 05. 02. 22

(19/20)

Marks: 20

1. Basic Catia V5: A part in Catia V5 has which suffix?
- A. CATPart
- o B. Model
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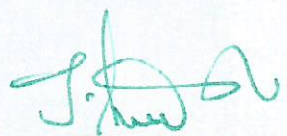A. Enhanced Scene

○ B. 3D split

○ C. Move

○ D. Assembly split

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Department of Mechanical Engineering Academic Year 2021-2022
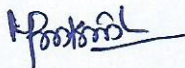Value Added Course - MECHVAC2102 – CATIA V5
Date: 01.02.2022 to 05.02.2022
LIST OF PARTICIPANTS
TOTAL NUMBER OF STUDENTS: 24
III MECH

S. No	Reg. No	Student Name	Marks(20)	Marks(100)
1	112819114002	BALAMURUGAN K	12	60
2	112819114004	DEEPAKKUMAR KV	14	70
3	112819114005	DINESH KUMAR M	16	80
4	112819114006	DIVAKAR R	16	80
5	112819114008	HARISH S	17	85
6	112819114009	JAYAKUMAR M	15	75
7	112819114010	KISHORE KUMAR R	14	70
8	112819114011	KOWSHIK M	20	100
9	112819114012	LOGANATHAN C	19	95
10	112819114013	MOHAN PRASANTH M	17	85
11	112819114014	MURUGAN S	17	85
12	112819114015	PATANAM HEMANTH KUMAR	16	80
13	112819114016	PONVEL K	10	50
14	112819114017	RIGIVAN G	12	60
15	112819114018	SANTHOSH KUMAR S	14	70
16	112819114019	AVINASH S	16	80
17	112819114020	SHEFTON JOSEPH MURRAY	18	90
18	112819114021	SIMSOAN J	17	85
19	112819114022	SINDHU S	15	75
20	112819114023	SNEGHAR N	13	65
21	112819114024	VIJI R	11	55
22	112819114025	VISHAL M	15	75
23	112819114301	ELANGOVAN K	10	50
24	112819114302	YUVANESH K	10	50

Co-coordinator

HOD

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Gummidipoondi Taluk,
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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2102 – CATIA V5
Date: 01.02.2022 to 05.02.2022
Attendance Sheet- III MECH

S. No	Reg. No	Student Name	01.02.22	02.02.22	03.02.22	04.02.22	05.02.22
1	112819114002	BALAMURUGAN K	BalaMurugan	BalaMurugan	BalaMurugan	Balamurgan	Balamuragan
2	112819114004	DEEPAKKUMAR KV	Deepak Kur	Deepak Kum	Deepak Kum	DeepKum	Deepak Kum
3	112819114005	DINESH KUMAR M	Dinesh	Dinah	Dinesh	Dinesh	Dinesh
4	112819114006	DIVAKAR R	Divakar	Divakar	Divakar	Divakar	Divakar
5	112819114008	HARISH S	Harish	Harish	Harish	Harish	Harish
6	112819114009	JAYAKUMAR M	Jaya Kumar	Jaya Kung	Jaya kunmar	Jaya kumar	Jaya Kumar
7	112819114010	KISHORE KUMAR R	Kishore Kumar R	Kishore kumar	Kishore Kumar	Kishore kumar	Kishore Kumar
8	112819114011	KOWSHIK M	kawshik.M	kawshic	kawshic	kawshic	kawshic
9	112819114012	LOGANATHAN C	Loganathe	Loganathe	Loganthe	Loganthe	Loganthan
10	112819114013	MOHAN PRASANTH M	Mohn Prasath	Mohn Prasath	Mohan Prasth.M	MohaPrasth	Mohan Prasth.M
11	112819114014	MURUGAN S	Murugan	Murugan	Murgan	Murugan	Murugan
12	112819114015	PATANAM HEMANTH KUMAR	Patanam Harkum	Padanam Hukum	Patanam He kum	Pala He kum	Pala nd H kum
13	112819114016	PONVEL K	Ponvel.K	Ponvel.K	Ponvel.K	Ponvel.K	Ponvel.K
14	112819114017	RIGIVAN G	Rigivan	Rigivan	Rigivan	Rigivan	Rigivan
15	112819114018	SANTHOSH KUMAR S	Santhoshkumar	Santhoshkum	Santhosh Kumar	Santhoshkuma	Santhosh Kumar
16	112819114019	AVINASH S	avinashs	avinash.j	avinash.S	avinashs	avinash.j
17	112819114020	SHEFTON JOSEPH MURRAY	Shefton	Shefton	Shefton	Shefton	Shefton
18	112819114021	SIMSOAN J	SIMSOAN.J	SIMSOAN.J	SIMSOAN.S	SIMSOANT	SIMSON.J
19	112819114022	SINDHU S	Sindhu	Sindhu	Sindhu	Sindhu	Sindhu
20	112819114023	SNEGHAR N	Sneghar	Sneghar	Sneghar	Sneghar	Sheghar.
21	112819114024	VIJI R	Viji	Viji	Viji	Viji	Viji
22	112819114025	VISHAL M	Vishal M	Vishal M	Vishal M	VishalM	Vishal M
23	112819114301	ELANGOVAN K	elangovan	elangovan	elangovan	elangovan	elangovan
24	112819114302	YUVANESH K	Yuvanesh	Yuvanesh	Yuvanesh	Yuvanesh	Yuvanesh.

Course Coordinator

HOD/MECH

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Department of Mechanical Engineering Academic Year 2021-2022

Value Added Course Summary - MECHVAC2102 – CATIA V5

Date: 01.02.2022 to 05.02.2022

Course Code & Name	: MECHVAC21 -02 – CATIA V5
Year Offered	: III-MECH Students
Course Coordinator	:Mr.M.Prakash
Course Type	: Industry Based
Course Outcome	:

  ➢ Understand the concepts of CAD and CAD tools.
  ➢ Visualize 3D objects using 2D design data.
  ➢ Sketch of Orthogonal Projection using 3D Models.
  ➢ Design and Create Part models and Assembly models.
  ➢ Create Drafting from Part and Assembly Models.

No. of Students Enrolled	: 24
No. of Students Appeared	: 24
Date of Exam	: 05.02.22
Mode of Exam	: MCQ Offline
No. of Students passed	: 24

Course Coordinator

HOD/MECH

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Department of Mechanical Engineering Academic Year 2021-2022

Value Added Course - MECHVAC2102 – CATIA V5
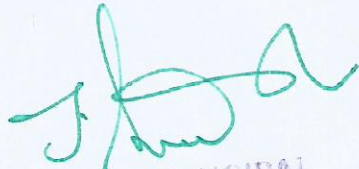
Date: 01.02.2022 to 05.02.2022

STUDENT FEED-BACK

NAME: Mohana Prasanth, N

YEAR: IV

DATE: 05.02.24

1. The instructor was well prepared for class

   a. Satisfactory   b. good   c. excellent   d. poor

2. The instructor was organized and used class time efficiently

   a. Yes   b. No

3. The instructor presented course material in a clear manner that facilitated understanding

   a. Satisfactory   b. good   c. excellent   d. poor

4. This class has increased my interest in this field of study.

   a. Yes   b. No

5. The reading were appropriate to the goals of the course

   a. Satisfactory   b. good   c. excellent   d. poor

6. I have put a great deal of effort into advancing my learning in this course

   a. Yes   b. No

7. The grading practices were fair

   a. Yes   b. No

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Gummidipoondi Taluk,
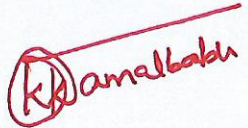Thiruvallur Dist - 601 206.

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FEMLOGIC TECHNOLOGIES

Department of Mechanical Engineering

&

Femlogic Technologies Pvt Ltd

CERTIFICATE OF APPRECIATION

This is to certify that has ___S. HARISH / III MECH___ successfully completed Value

added course on **MECHVAC2102-CATIA V5** conducted during 01.02.22 TO 05.02.22 **at Department of**

Mechanical Engineering, T.J.S Engineering College.

HOD/Convenor

PRINCIPAL

Mr.K.Arunkumar
Femlogic Technologies Pvt Ltd

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Value Added Course

MECHVAC2103-CNC Programming and CNC Machining

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01.03.2022

From

Dr. K. Kamal Babu,

Head of The Department,

Department of Mechanical Engineering,

T.J.S. Engineering College,

Peruvoyal, Kavaripettai

Gummidipoondi Taluk, Thiruvallur District , TN-601206.

To

The Principal,

T.J.S. Engineering College,

Peruvoyal, Kavaripettai

Gummidipoondi Taluk, Thiruvallur District , TN-601206.

Respected Sir,

Sub : **Permission to offer value added course on MECHVAC2103- CNC Programming and CNC Machining – Reg.**

I wish to inform you that, we have planned to conduct value added course on **"MECHVAC2103- CNC Programming and CNC Machining"** for B.E II Year Mechanical Engineering Students from 07.03.2022 to 11.03.2022. In this regard, we are requesting you to grant permission to the above value added course.

Thanking You

Your Sincerely,

(Dr. K. Kamal Babu)

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03.03.2022

CIRCULAR

It is hereby informed that Department of Mechanical Engineering is planning to conduct a Value added Course on **"MECHVAC2103- CNC Programming and CNC Machining"** from 07.03.2022 to 11.03.2022 in TJSEC Seminar Hall for II Year Mechanical Engineering Students by Mr. Shyam prasanth P, Director, Unique Control Systems, Chennai, at 9.00 a.m. Hence all the Heads of the departments, faculty members and students are requested to attend the programme.

Principal

Copy to

1. IQAC

2. All HOD's (to circulate among their staff members & students)

3. Library

4. Notice Board

5. File

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TJS Nagar, Peruvoyal, Near Kavaraipettai, GummidipoondiTaluk, Thiruvallur District -601206

Department of Mechanical Engineering

and

Unique Control Systems

Jointly Organizes

Value Added Course

on

MECHVAC2103- CNC Programming and CNC Machining

(5 days Program from 07.03.2022 to 11.03.2022)

Resource Person

Mr. Mr. Shyam Prasanth P,

Director, Unique Control Systems

Chennai

Venue : Seminar Hall, TJSEC

Time : 9.00 am

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2103- CNC Programming and CNC Machining
Syllabus

COURSE OBJECTIVE :

- Evaluate manufacturing assignment based on critical thinking and problem solving skills. Become a good communicator and effective team member.
- Practice writing complex "G" code programs for CNC turning centers that meet the part specification
- Describe and illustrate common problems with tooling and fixtures in CNC programming and machining.

MODULE 1: INTRODUCTION TO CNC TECHNOLOGY & PROGRAMMING

Introduction to CNC technology – CNC machines controls. History & development of CNC technology. Numerical control on CNC machine tools CNC control and CNC Control and types of CNC control Calculation of technological data for CNC machining. CNC clamping system.

MODULE 2: DRAWING INTERPRETATION

Drawing interpretation practice, identifying feature from sketch and operation from feature

MODULE 3: CNC PROGRAMMING

Introduction to CNC programming Introduction and demonstration of line programs CNC programming or lathe & milling machine use ISO codes into the CNC simulator. CNC programming for lathe and milling machines using different machining cycles into the CNC simulator. Process planning issues and path planning. G & M Codes, Interpolations, Canned Cycles and Subprograms.
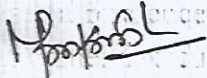
MODULE 4: CNC TURNING

Plan and optimize programs for CNC turning operations. Calculate parameters like speed feed etc. and set a references for the various operations. Prepare & set CNC lathe operations and test run programmed Execute program and inspect simple geometrical forms / standard parts Use of various PPE's on CNC lathe machine -Machining of programmed exercise on CNC lathe machine.
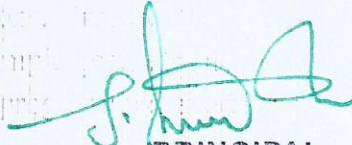
MODULE 5: CNC MILLING

Plan and optimize programs for CNC Milling operations. Calculate parameters like speed feed, depth of cut etc. and set a references for the various operations. Execute program and inspect simple geometrical forms / standard parts. Machining of programmed exercise on CNC milling machine.

Course Outcome:

- Explain applications and advantages of CNC machines and technology.
- Demonstrate and explain various CNC control Calculate technological data for CNC machining.
- Prepare programs , demonstrate , simulate and operate CNC lathe machines & CNC milling machines for various machining operations

Course Coordinator

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HOD/MECH

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2103- CNC Programming and CNC Machining
Date: 07.03.2022 to 11.03.2022
Course Schedule:

Day & Date	Session	Topics to be Covered	Speaker Name
Day1 & 07.03.22	9.00 am to 1.00 pm	Introduction to CNC technology – CNC machines controls. History & development of CNC technology. Conventional Vs. non-conventional machine tool.	Mr. Mr. Shyam prasanth P, Director, Unique Control Systems. Chennai
	1.30 pm to 4.30 pm	Numerical control on CNC machine tools CNC control and CNC Control and types of CNC control Calculation of technological data for CNC machining. CNC clamping system.	Mr. Mr. Shyam prasanth P, Director, Unique Control Systems. Chennai
Day2 & 08.03.22	9.00 am to 1.00 pm	Drawing interpretation practice,	Mr. Mr. Shyam prasanth P, Director, Unique Control Systems. Chennai
	1.30 pm to 4.30 pm	Identifying feature from sketch and operation from feature	Mr.M.Prakash Assistant Professor MECH/TJSEC
Day3 & 09.03.22	9.00 am to 1.00 pm	Introduction to CNC programming Introduction and demonstration of line programs CNC programming or lathe & milling machine use ISO codes into the CNC simulator. CNC programming for lathe and milling machines.	Mr. Mr. Shyam prasanth P Director, Unique Control Systems. Chennai
	1.30 pm to 4.30 pm	Procedures Associated with part programming, Cutting process parameter selection, Process planning issues and path planning, G & M Codes, Interpolations, Canned Cycles and Subprograms.	Mr.M.Prakash Assistant Professor MECH/TJSEC
Day4 & 10.03.22	9.00 am to 1.00 pm	Plan and optimize programs for CNC turning operations. Calculate parameters like speed feed etc. and set a references for the various operations. Prepare & set CNC lathe operations and test run programmed Execute program and inspect simple geometrical forms / standard parts	Mr. Mr. Shyam prasanth P Director, Unique Control Systems. Chennai
	1.30 pm to 4.30 pm	Use of various PPE's on CNC lathe machine -Machining of programmed exercise on CNC lathe machine.	Mr.M.Prakash Assistant Professor MECH/TJSEC
Day5 & 11.03.22	9.00 am to 1.00 pm	Plan and optimize programs for CNC Milling operations. Calculate parameters like speed feed, depth of cut etc. and set a reference for the various operations.	Mr. Mr. Shyam prasanth P, Director, Unique Control Systems. Chennai
	1.30 pm to 4.30 pm	Execute program and inspect simple geometrical forms / standard parts. Use of various PPE's on CNC milling machine-Machining of programmed exercise on CNC milling machine.	Mr.M.Prakash Assistant Professor MECH/TJSEC

Course Coordinator

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2103- CNC Programming and CNC Machining
Date: 07.03.2022 to 11.03.2022
LIST OF PARTICIPANTS
TOTAL NUMBER OF STUDENTS: 30

II-MECH

S. No	Reg. No	Student Name
1	112820114001	DEEPAK C
2	112820114002	DHANASEKAR C
3	112820114003	HARI PRASHANTH P
4	112820114004	IMESH KUMAR M
5	112820114005	RITHISH KUMAR R
6	112820114006	SIVA P
7	112820114007	VASANTH V
8	11282014301	ADHIYAN V
9	11282014302	AKILESH R
10	112820114303	ARIVAZHAGAN M
11	112820114304	ASHOK KUMAR B
12	112820114305	BARATH KUMAR P
13	112820114306	BHARATH V
14	112820114307	GOKUL PRASAATH M
15	112820114308	HARI G
16	112820114309	HARISHKUMAR R
17	112820114310	JAYA PRADHISH R
18	112820114311	MANOSH M
19	112820114312	NAVEEN KUMAR J R
20	112820114313	PRABHAKARAN E
21	112820114314	PRATHAP S
22	112820114315	PREETHIVRAJ D
23	112820114317	RISHIKUMAR N
24	112820114318	SRINATH M
25	112820114319	SURENDHAR E
26	112820114320	SURYA P
27	112820114321	VIJAY M
28	112820114322	VISHNUPRIYAN T
29	112820114323	YOGESH V
30	112820114324	YUVARANJAN A

Courser-Coordinator

HOD

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2103- CNC Programming and CNC Machining
Date: 07.03.2022 to 11.03.2022
Resource Person Profile

Resource Person1:

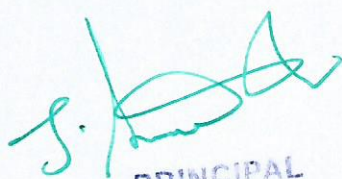|		
Name	:	Mr. P.Shyam prasanth
Designation	:	Director
Department	:	Mechanical Engineering
Organization	:	Unique Control Systems
Phone Number	:	+91 6369599499
Email ID	:	controlsystems28@gmail.com
Qualification	:	Bachelors in Engineering
Experience	:	6 years
Specialization	:	CAD& CAM
Address	:	169, Vivekanandha Nagar, First Main Road, Gummidipoondi, Chennai - 601 201,

Resource Person 2:

Name	:	Mr.M.Prakash
Designation	:	Assistant Professor
Department	:	Mechanical Engneering
Organization	:	TJS Engineering College
Phone Number	:	+91 9840132371
Email ID	:	serc2008@gmail.com
Qualification	:	Masters in Engineering
Experience	:	12 Years
Specialization	:	Manufacturing
Address	:	Plot NO.17, Sabari Garden, Pethikuppam Gummidipoondi, Thiruvallur – District. Pin 601 201

Courser-Coordinator

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2103- CNC Programming and CNC Machining
Date: 07.03.2022 to 11.03.2022
Assessment Questions

Name: Marks: 20

Year:

Date:

1. In NC (Numerical Control) machine tool, the position feedback package is connected between

   a. control unit and programmer
   b. programmer and machine tool
   c. control unit and machine tool
   d. programmer and process planning

2. Several machine tools can be controlled by a central computer in

   a. NC (Numerical Control) machine tool
   b. CNC (Computer Numerical Control) machine tool
   c. DNC (Direct Numerical Control) machine tool
   d. CCNC (Central-Computer Numerical Control) machine tool

3. Arrange the below operations in operator controlled machine tool in correct order.

   (A) Operator
   (B) Process planing
   (C) Machine tool
   (D) Component drawing
   (E) Completed component
   a. (A) – (D) – (B) – (C) – (E)
   b. (D) – (B) – (C) – (A) – (E)
   c. (B) – (D) – (C) – (A) – (E)
   d. (D) – (B) – (A) – (C) – (E)

4. The device, fed to the control unit of NC machine tool which sends the position command signals to sideway transmission elements of the machine, is called as

   a. controller
   b. tape
   c. feedback unit
   d. none of the above

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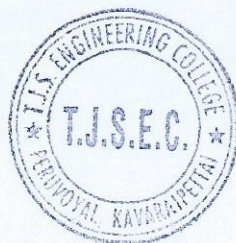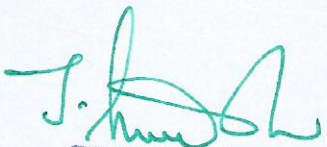Gummidipoondi Taluk,
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5. Which of the following options is correct for the control unit and panel of NC (Numerical Control) and CNC (Computer Numerical Control) machine tools?

   a. The control unit of NC machine tool works in ON-line mode and the control unit of CNC machine tool works in batch processing mode
   b. The control unit of NC machine tool works in batch processing mode and the control unit of CNC machine tool works in ON-line mode
   c. The control units of both NC and CNC machines work in ON-line mode
   d. The control units of both NC and CNC machines work in batch processing mode

6. In CNC machine tool, the part program entered into the computer **memory**

   a. can be used only once
   b. can be used again and again
   c. can be used again but it has to be modified every time
   d. cannot say

7. Part-programming mistakes can be avoided in

   a. NC (Numerical Control) machine tool
   b. CNC (Computer Numerical Control) machine tool
   c. Both a. and b.
   d. None of the above

8. The machine tool, in which calculation and setting of the operating conditions like depth of cut, feed, speed are done during the machining by the control system itself, is called

   a. Computer Numerical Control System
   b. Direct Numerical Control System
   c. Machining Centre System
   d. Adaptive Control System

9. Which machine tool reduces the number of set-ups in machining operation, time spent in setting machine tools and transportation between sections of machines?

   a. Computer Numerical Control machine tool
   b. Direct Numerical Control machine tool
   c. Adaptive Control Systems
   d. Machining centre

10. In N C machine tool, the position feedback package is connected with?
    a. Control unit and machine tool
    b. Control unit and programmer
    c. Programmer and machine tool
    d. Programmer and process planning

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11. Commonly used M-Code for end of sub program is -----------
    a) M 00
    b) M 99
    c) M 98
    d) M 97

12. Commonly used G-Code for thread cutting mill cycle is -----------
    a) G31
    b) G33
    c) G27
    d) G76

13. Commonly used M-Code for tool change mill cycle is
    a) M 00
    b) M 06
    c) M 02
    d) M 03

14. Commonly used M-Code for coolant off cycle is ----------
    a) M 00
    b) M 09
    c) M 02
    d) M 03

15. Commonly used G-Code for fine boring cycle is -----------
    a) G 70
    b) G 76
    c) G 73
    d) G 71

16. Commonly used G-Code for rough turning cycle is -----------
    a) G 70
    b) G 71
    c) G 73
    d) G 76

17. NC contouring is an example of
    a) Continuous path positioning
    b) Point to point positioning
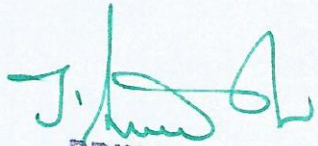   c) Absolute positioning
    d) Incremental positioning

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18. Commonly used G-Code for deep drilling is -----------
   a) G 82
   b) G 83
   c) G 85
   d) G 87

19. IN C NC M80 code represents
   a) Cancel the mirror image
   b) Machining operation
   c) Machining memory
   d) None

20. In C N C G78 stands for------------
   a) Mill internal thread
   b) Mill external thread
   c) Turn external thread
   d) None

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2103- CNC Programming and CNC Machining
Date: 07.03.2022 to 11.03.2022
Assessment Questions

Name: H. Omeshkumar

Marks: 20

Year: II

Date: 11.03.22

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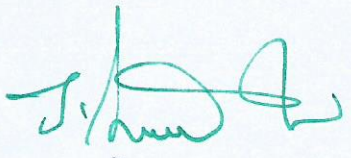Gummidipoondi Taluk,
Thiruvallur Dist - 601 206,

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    b) M 09
    c) M 02
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    c) G 73
    d) G 71

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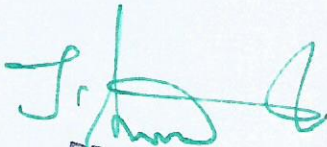
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    b) Mill external thread
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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2103- CNC Programming and CNC Machining
Date: 07.03.2022 to 11.03.2022
LIST OF PARTICIPANTS
TOTAL NUMBER OF STUDENTS: 30
II MECH

S. No	Reg. No	Student Name	Marks(20)	Marks(100)
1	112820114001	DEEPAK C	18	90
2	112820114002	DHANASEKAR C	15	75
3	112820114003	HARI PRASHANTH P	16	80
4	112820114004	IMESH KUMAR M	18	90
5	112820114005	RITHISH KUMAR R	19	95
6	112820114006	SIVA P	19	95
7	112820114007	VASANTH V	17	85
8	112820114301	ADHIYAN V	17	85
9	112820114302	AKILESH R	15	75
10	112820114303	ARIVAZHAGAN M	16	80
11	112820114304	ASHOK KUMAR B	12	60
12	112820114305	BARATH KUMAR P	14	70
13	112820114306	BHARATH V	13	65
14	112820114307	GOKUL PRASAATH M	15	75
15	112820114308	HARI G	16	80
16	112820114309	HARISHKUMAR R	16	80
17	112820114310	JAYA PRADHISH R	15	75
18	112820114311	MANOSH M	18	90
19	112820114312	NAVEEN KUMAR J R	18	90
20	112820114313	PRABHAKARAN E	19	95
21	112820114314	PRATHAP S	19	95
22	112820114315	PREETHIVRAJ D	18	90
23	112820114317	RISHIKUMAR N	16	80
24	112820114318	SRINATH M	14	70
25	112820114319	SURENDHAR E	13	65
26	112820114320	SURYA P	13	65
27	112820114321	VIJAY M	13	65
28	112820114322	VISHNUPRIYAN T	14	70
29	112820114323	YOGESH V	14	70
30	112820114324	YUVARANJAN A	15	75

Co-coordinator

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Department of Mechanical Engineering Academic Year 2021-2022
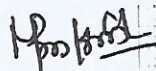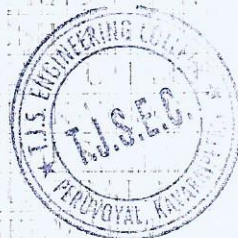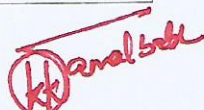### Value Added Course - MECHVAC2103- CNC Programming and CNC Machining
Date: 07.03.2022 to 11.03.2022
Attendance Sheet- II MECH

S. No	Reg. No	Student Name	07.03.22	08.03.22	09.03.22	10.03.22	11.03.22
1	112820114001	DEEPAK C	C.Deep	C.Deep	C.Deep	C.Deep	C.Deep
2	112820114002	DHANASEKAR C	C.Dhanasekar	C.Dhasekar	C.Dhanasekar	C.Dhsekar	C.Dhanasekar
3	112820114003	HARI PRASHANTH P	DH	DH	DH	DH	DH
4	112820114004	IMESH KUMAR M	imesh kumar-M	imesh kumar.M	imesh kumar.m	imesh kumar.M	imesh kumar-m
5	112820114005	RITHISH KUMAR R	R.Rithish kumar	R.Rithish kumar	R.Rithish kumar	R.Rithish kumar	R.Rithish Kumar
6	112820114006	SIVA P	P.Siva	P.siva	P.Siva	P.Siva	P.Sive
7	112820114007	VASANTH V	Vasanth	Vasanth	Vasanth	Vasanth	Vasanth
8	112820114301	ADHIYAN V	Y.Adhi	Y.Adhy	Y.Adhy	Y.Adhy	Y.Adhy
9	112820114302	AKILESH R	Akilesh.R	Akilesh.R	Akilesh.R	Akilesh.R	Akilesh.R
10	112820114303	ARIVAZHAGAN M	Arivaz.M	Arivag.M	Arivaz.M	Arivaz.M	Arivaz.M
11	112820114304	ASHOK KUMAR B	Ashok.B	Ashok.B	Ashok.B	Ashok.B	Ashok.B
12	112820114305	BARATH KUMAR P	barath	barath	barath	barath	barath
13	112820114306	BHARATH V	V.Bharth	V.Bharth	V.Bharth	V.Bharth	V.Bharth
14	112820114307	GOKUL PRASAATH M	Gokul	Gokul	Gokul	Gokul	Gokul
15	112820114308	HARI G	Hari.G	Hari.G	Hari.G	Hari.G	Hari.G
16	112820114309	HARISHKUMAR R	Harikum.R	Harikum.R	Harikum.R	Harikum.R	Harikum.R
17	112820114310	JAYA PRADHISH R	Jaya Pradhish	Jaya Pradhish	Jaya Pradhish	Jaya Pradhish	Jaya.Pradhish
18	112820114311	MANOSH M	monosh m	monosh m	monosh m	monosh m	monosh m
19	112820114312	NAVEEN KUMAR J R	J.R.Naveen	J.R.Naveen	J.R.Naveen	J.R.Naveen	J.R.Naveen
20	112820114313	PRABHAKARAN E	Prabhakaran E	Prabhakaran E	Prabhakaran E	Prabhakaran E	Prabhakaran E
21	112820114314	PRATHAP S	S.Prath	S.Pora.HP	S.Prenth	S.Prath	S.Prath
22	112820114315	PREETHIVRAJ D	D.Preethivraj	D.Preethivraj	D.Preethivraj	D.preethivraj	D.preethivraj
23	112820114317	RISHIKUMAR N	Rishi.N	Rishin	Rishin	Rishi	Rishi
24	112820114318	SRINATH M	Srinath M	Srinath M	Srinath M	Srinath M	Srinath M
25	112820114319	SURENDHAR E	surendhar	surendhar	surendhar	surendhar	surendhar
26	112820114320	SURYA P	Surya.P	Surya.P	Surya.P	Surya.P	Surya.P
27	112820114321	VIJAY M	M.Vijay	M.Vijay	M.Vijay	M.Vijay	M.Vijay

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28	112820114322	VISHNUPRIYAN T					
29	112820114323	YOGESH V					
30	112820114324	YUVARANJAN A					

Course Coordinator

HOD

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2103- CNC Programming and CNC Machining
Date: 07.03.2022 to 11.03.2022

Course Code & Name	: MECHVAC2103- CNC Programming and CNC Machining
Year Offered	: II-MECH Students
Course Coordinator	:Mr.M.Prakash
Course Type	: Industry Based
Course Outcome	:

- Explain applications and advantages of CNC machines and technology
- Demonstrate and explain various CNC control Calculate technological data for CNC machining
- Prepare programs , demonstrate , simulate and operate CNC lathe machines for various machining operations
- Prepare programs , demonstrate , simulate and operate CNC milling machines for various machining operations

No. of Students Enrolled	: 30
No. of Students Appeared	: 30
Date of Exam	: 11.03.22
Mode of Exam	: MCQ Offline
No. of Students passed	: 30

Course Coordinator

HOD

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Department of Mechanical Engineering Academic Year 2021-2022
Value Added Course - MECHVAC2103- CNC Programming and CNC Machining
Date: 07.03.2022 to 11.03.2022

STUDENT FEED-BACK

NAME: Deepak . c

YEAR: II

DATE: 11. 03.22

1. The instructor was well prepared for class

    a. Satisfactory   b. good   c. excellent   d. poor

2. The instructor was organized and used class time efficiently

    a. Yes   b. No

3. The instructor presented course material in a clear manner that facilitated understanding

    a. Satisfactory   b. good   c. excellent   d. poor

4. This class has increased my interest in this field of study.

    a. Yes   b. No

5. The reading were appropriate to the goals of the course

    a. Satisfactory   b. good   c. excellent   d. poor

6. I have put a great deal of effort into advancing my learning in this course

    a. Yes   b. No

7. The grading practices were fair

    a. Yes   b. No

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Department of Mechanical Engineering
&
Unique Control Systems

CERTIFICATE OF APPRECIATION

This is to certify that has _M. JMESH KUMAR / II MECH_ successfully completed Value added course on **MECHVAC2103- CNC Programming and CNC Machining** conducted during 7th March to 11th March 2022 at Department of Mechanical Engineering, T.J.S Engineering College.

HOD/Convenor

PRINCIPAL

Mr.M.Shyam Prasanth
Unique Control Systems

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T.J.S. ENGINEERING COLLEGE
Peruvoyal, Kavaraipettai,
Gummidipoondi Taluk,
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