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SAPTHAGIRI COLLEGE OF ENGINEERING, BANGALORE – 57

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F-ADM-02/RO

DEPARTMENT OF BIOTECHNOLOGY

TIME TABLE - ACADEMIC YEAR 2022-2023 -EVEN SEM

OVERALL TIME TABLE

PERIOD	SEMESTER	1	2		3	4		5	6	7
TIME / DAY		8:30- 9:30	9:30-10:30	10:30- 10:50	10:50-11:50	11:50- 12:50	12:50-01:45	01:45-02:40	02:40-03:35	03:35-04:30
MON	IV	21BT41-SBS	21BT42-BJ		21BT44-RDL	21BT43-VSM		Tutorial Class	Tutorial Class	
	VI	18BT63-RDL	18BT61-KMV		18BT651-GM	18BT62-KMV		Placements Training Program/ Communication skills Training		
	VIII	PROJECT			PROJECT			TECHNICAL SEMINAR		
TUE	IV	21UH49-RK	21BT43-VSM		21KSK47	21BT44-RDL		Tutorial Class		
	VI	18BT651-GM	18BT63- RDL		18BT61-KMV	18BT641-GM		18BTL66-B1/18BTL67-B2		
	VIII	PROJECT			PROJECT			FORUM ACTIVITY		
WED	IV	-------	21BE45-CS	SHORT BREAK	21BT41-SBS	21BT43-VSM	LUNCH BREAK	← GE/CCT LAB- B1/B2 →		
	VI	18BT61-KMV	18BT63-RDL		18BT651-GM	18BT62-KMV		18BTMP68-MINI Project(FOR ALL)		
	VIII	PROJECT			PROJECT			TECHNICAL SEMINAR		
THU	IV	21BT483-CBS	21BT42-BJ		21BE45-CS	21BT4-SBS		← CCT/PYTHON LAB- B1/B2 →		
	VI	18BT651-GM	18BT62-KMV		18BT63-RDL	18BT641-GM		18BTL66-B2/18BTL67-B3		
	VIII	PROJECT			PROJECT			TUTORIAL CLASSES		
FRI	IV	21BE45- CS	21BT43-VSM		21BT44-RDL	21BT42-BJ		← PYTHON/GE LAB-B1/B2 →		
	VI	18BT61- KMV	18BT641-GM		18BT62- KMV	-------		Placements Training Program/ Communication skills Training		
	VIII	18BT81- CBS	18BT822-SG		18BT81- CBS	18BT822-SG		TECHNICAL SEMINAR		
SAT	IV	21BT44-RDL	21BT4-SBS		21BT483- CBS	21KBK47				
	VI	18BT641-GM	← 18BTL66-B3/18BTL67-B1 18BTMP68-B2-MINI Project →							
	VIII	18BT81- CBS	18BT822-SG		18BT81- CBS	18BT822-SG				

Time Table Coordinator

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DEPARTMENT OF BIOTECHNOLOGY

TIME TABLE - ACADEMIC YEAR 2022-2023 -EVEN SEM

F-ADM-02/RO

CLASS TIME TABLE - IV SEMESTER

Lecture Hall: CLH 209 (Academic Block)

Class Teacher Name:		Dr Gowri Mirji								
1	Proctor Name	Prof .Ramya D L		Mobile : 9538234078		Email : ramyadl@sapthagiri.edu.in				
2	Proctor Name	Prof.Sunil Kumar B S		Mobile : 9743992423		Email: sunilkumarbs@sapthagiri.edu.in				
PERIOD	1	2		3	4		5	6	7	
TIME DAY	8:30–9:30	9:30–10:30	10:30-10:50	10:50 -11:50	11:50-12:50	12:50-01:45	01:45-02:40	02:40-03:35	03:35-04:30	
MON	21BT41-SBS	21BT42-BJ	Short Break (20 minutes)	21BT44-RDL	21BT43-VSM	Lunch Break (55 minutes)	Tutorial Class			
TUE	21UH49-RK	21BT43-VSM		21KSK47	21BT44-RDL		Forum activity			
WED	----	21BE45-CS		21BT41-SBS	21BT43-VSM		← GE/CCT LAB → B1/B2			
THU	21BT483-CBS	21BT42-BJ		21BE45-CS	21BT41-SBS		← CCT/PYTHON LAB → B1/B2			
FRI	21BE45- CS	21BT43-VSM		21BT44-RDL	21BT42-BJ		← PYTHON/GE LAB → B1/B2			
SAT	21BT44-RDL	21BT41-SBS		21BT483- CBS	21KBK47					

Subjects Allocation

Sl.No	Subject Code	Subject Title	Subject Abbreviation	Faculty Name	Faculty Code
1	BSC 21BT41	Biostatistics and Design of experiments	BDE	Prof.Shwetha	
2	IPCC 21BT42	Python programming + lab	PP+LAB	Prof.Bhanu Jyothi	BJ
3	IPCC 21BT43	Cell biology &Cell culture techniques + lab	CCT+LAB	Dr. Veena S More/Dr Gouri Mirji/ Prof. Sunil Kumar B S	VSM/GM/SBS
4	PCC 21BT44	Molecular biology &Genetic engineering	MB&GE	Prof.Ramya D L	RDL
5	AEC 21BE45	Biology for engineers	BE	Dr Soumya C	CS
6	PCC21BTL46	Molecular biology &Genetic engineering lab	MB&GE LAB	Dr. Chaitra B S/Prof. Sunil Kumar B S	CBS
7	HSMC 21KSK47	Samskrutika Kannada	--	Prof.Lakshmi	
8	HSMC21KBK47	Balake Kannada	--	Prof.Lakshmi	
9	AEC21BT483	Biopesticides &Biofertilizers-AEC-IV	B&B	Dr Chaitra B S	CBS
10	UHV21UH49	Universal Human Values	UHV	Prof.Ram Kumar	RK
11	INT2 NNT49	Inter/Intra Institutional Internship	--	Dr Gouri Mirji	GM

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DEPARTMENT OF BIOTECHNOLOGY

TIME TABLE - ACADEMIC YEAR 2022-2023 -EVEN SEM

F-ADM-02/RO

CLASS TIME TABLE - VI SEMESTER — **Lecture Hall:CLH 208 (Academic Block)**

Class Teacher Name:		Dr Soumya C							
1	Proctor Name	Dr Chaitra B S		Mobile : 7760917624		Email : chatrabs@sapthagiri.edu.in			
2	Proctor Name	Prof.Kavya M V		Mobile : 7899351862		Email: kavyamv@sapthagiri.edu.in			
PERIOD	1	2		3	4		5	6	7
TIME DAY	8:30 – 9:30	9:30 – 10:30	10:30 - 10:50	10:50 - 11:50	11:50 - 12:50PM	12:50 - 01:45	01:45 - 02:40	02:40 - 03:35	03:35 - 04:30
MON	18BT63 RDL	18BT61 KMV	Short Break (20 minutes)	18BT651 GM	18BT62 KMV	Lunch Break (55 minutes)	Placements Training Program/Communication Skill Training		
TUE	18BT651 GM	18BT63 RDL		18BT61 KMV	18BT641 GM		18BTL66-B1/18BTL67-B2		
WED	18BT61 KMV	18BT63 RDL		18BT651 GM	18BT62 KMV		18BTMP68-MINI Project(FOR ALL)		
THU	18BT651 GM	18BT62 KMV		18BT63 RDL	18BT641 GM		18BTL66-B2/18BTL67-B3		
FRI	18BT61 KMV	18BT641 GM		18BT62 KMV	-------		Placements Training Program/ Communication skills Training		
SAT	18BT641 GM	← 18BTL66-B3/18BTL67-B1 18BTMP68-B2-MINI Project →							

Subjects Allocation

Sl.No	Subject Code	Subject Title	Subject Abbreviation	Faculty Name	Faculty Code
1	18BT61	Process Control and automation	PCA	Prof Kavya M V	KMV
2	18BT62	Bioprocess equipment Design & CAED	CAED	Prof Kavya M V	KMV
3	18BT63	Bioinformatics	BI	Prof.Ramya D L	RDL
4	18BT641	Food Processing Engineering	FPE	Dr Gouri Mirji	GM
5	18BT651	Open elective- Biology for Engineers	BE	Dr Gouri Mirji	GM
6	18BTL66	Process Control and automation lab	PCA Lab	Prof Kavya M V	KMV
7	18BTL67	Bioinformatics Lab	BI Lab	Prof.Ramya D L	RDL

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DEPARTMENT OF BIOTECHNOLOGY

TIME TABLE - ACADEMIC YEAR 2022-2023 -EVEN SEM

CLASS TIME TABLE - VIII SEMESTER — **Lecture Hall:CLH 209 (Academic Block)**

Class Teacher Name:		Dr Ramya D L							
1	Proctor Name	Dr Shobha G		Mobile : 9738512842		Email : shobhag@sapthagiri.edu.in			
2	Proctor Name	Dr GauriMirji		Mobile : 9964591024		Email: gourimirji_bt@sapthagiri.edu.in			
PERIOD	1	2		3	4		5	6	7
TIME DAY	8:30 – 9:30	9:30 – 10:30	10:30 - 10:50	10:50 - 11:50	11:50 - 12:50PM	12:50 - 01:45	01:45 - 02:40	02:40 - 03:35	03:35 - 04:30
MON	PROJECT		Short Break (20 minutes)	PROJECT		Lunch Break (55 minutes)	TECHNICAL SEMINAR		
TUE	PROJECT			PROJECT			FORUM ACTIVITY		
WED	PROJECT			PROJECT			TECHNICAL SEMINAR		
THU	PROJECT			PROJECT			TUTORIAL CLASSES		
FRI	18BT81 CBS	18BT822 SG		18BT81 CBS	18BT822 SG		TECHNICAL SEMINAR		
SAT	18BT81 CBS	18BT822 SG		18BT81 CBS	18BT822 SG				

Subjects Allocation

Sl.No	Subject Code	Subject Title	Subject Abbreviation	Faculty Name	Faculty Code
1	18BT81	Regulatory Affairs In Biotech Industry	RABI	Dr Chaithra	CBS
2	18BT822	Industrial Microbiology	IM	Dr Shobha G	SG
3	18BTP83	Project Work Phase - 2		Dr. Shobha G	SG
4	18BTS84	Technical Seminar		Prof. Ramya D L	RDL
5	18BTI85	Internship		Dr. Chaitra B S	CBS

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DEPARTMENT OF BIOTECHNOLOGY

Third Semester B.E. Biotechnology Engineering

UNIT OPERATIONS (21BT32)

MODULE-1

1. Derive Bernoullis equation stating all the assumptions made.
2. Explain in brief, the different types of flow according to Reynolds number.
3. Explain Newtonian & Non Newtonian fluids with examples and graph.
4. Sketch stress versus strain diagram for Non-Newtonian fluid.
5. Explain continuity equation.
6. Calculate the pressure drop due to friction in a 300 m long pipe of 150 mm internal diameter through which water is flowing at 0.05 m^3/s (density=1000kg/m^3& Viscosity 1 x10^{-3} Ns /m^2)
7. With a neat sketch explain the working principle of a Rotameter.
8. State the types of fluids with suitable examples that are not Newtonian by nature. In a neat diagram mark the relation between shear stress and velocity gradient.
9. Explain the term "Terminal Settling Velocity"
10. A pipe line of 120 mm diameter carries water at the rate of 30 ltr/sec. The viscosity of water is 0.012 poise and friction factor is 0.0054. Find the pressure drop over a length of 100 m. (63.33 kN/m^2)
11. Define Fanning's friction factor. How is it related to the pressure drop?

MODULE-2

1. Explain the principle, construction and working of a venturi meter with the help of a neat sketch.
2. A U-tube differential mercury manometer is connected between two pipes X and Y. Pipe X contains carbon tetra chloride (sp.gr 1.594) under a pressure of 103 kN/m^2 and pipe Y contains oil (sp.gr 0.8) under a pressure of 172 kN/m^2. Pipe X is 2.5 m above pipe Y. Mercury level in the limb connected to pipe X is 1.5 m below the center line of pipe Y. Find the manometer reading in cm.
3. State different principles of pressure measurement.State and derive the expression for the three basic laws of size reduction. What is the size range of feed for their applicability?
4. What are the preventive measures for reducing swirling in agitated tanks?
5. With a neat sketch explain the working of a plate and frame filter press
6. Discuss the basic principles in centrifugal filtration
7. Derive an expression for thickness of cake and volume of filtrate for filtration
   a. At constant rate

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35. Define 'Bonds law' of crushing

Mesh	Feed	Oversize	Undersize
35	7.07	13.67	0
48	16.60	32.09	0
65	14.02	27.12	0
100	11.82	20.70	2.32
150	9.07	4.35	14.32
200	7.62	2.07	13.34
-200	33.80	0	70.02
	100	100	100

MODULE-3

1. Explain different modes of heat transfer.
2. Derive an expression for steady state conduction through a composite wall.Discuss briefly the difference between film-wise and drop-wise condensation. What are the methods employed to promote drop-wise condensation?
3. Define LMTD .
4. Derive an expression for the rate of heat transfer through a composite plane wall consisting of three heterogeneous layers having thermal conductivity; K1,K2 and K3 respectively.
5. A plane brick wall, 25 cm thick, is faced with 5 cm thick concrete layer. If the temperature of the exposed brick face is 70°C and that of the concrete is 25°C, find out the heat lost per hour through a wall of 15 m x10 m. Also, determine the interface temperature. Thermal conductivity of the brick and concrete are 0.7 W/m.K and 0.95 W/m.K respectively.
6. Derive an expression for the temperature profile in a thick walled cylinder during heat transfer by conduction under steady state.
7. A furnace is constructed is to be with 225 mm thick of fire brick,120 mm of insulating brick and 225 mm of building brick.The inside temperature is 1200 K and outside temperature is 330 K. Find the heat loss per unit area and the temperature at junction of the fire brick and insulating brick.
    a. Data: k (Thermal conductivity) for fire brick=1.4 W/m.K
        i. k for insulating brick = 0.2 W/m.K
        ii. k for building brick = 0.7 W/m.K
8. Derive an expression for heat conduction through the metallic wall of a hollow sphere at steady state. Prove that the area for heat transfer through a spherical wall can be expressed as follows : $A = (A1A2)^{1/2}$, where A1, and A2 represent the inside and outside surface area.

6. Compare between extraction and distillation.
7. Explain the characteristics of solvent used in extraction.
8. 10 kmol of a feed containing 55 mol. % of a component A and 45 mol. % of B was processed in a distillation unit. 5 kmol of distillate with composition of 90 mol. % of A was obtained. What are the amount and composition of the bottom product?
9. A sample containing 2.5 kg of a dry material and 0.67 kg of water was inserted in a tray dryer. The critical and the equilibrium moisture contents of the material obtained from experimental data were WAc = 0.14 and WA* = 0.05. The mass of the sample decreased by 0.07 kg after 10 minute drying in the I. period. Calculate: a) period of time needed to reach the moisture content of WA = 0.07, b) the moisture content after 70 min. of drying. Assume linear dependence of the drying rate on the moisture content of the material for the II. period of drying.
10. 100 kmol of a 60 mole% benzene–toluene mixture is subjected to batch distillation until a 30 mole% residue is obtained. How many kg of distillate is obtained, and what is its benzene content? (Also solve the problem using relative volatility, average α) A benzene–toluene mixture containing 60 mole% toluene is batch distilled at atmospheric pressure until 903.2 kg residue having 12 mole% benzene content is obtained. What is the mass and the composition of the resulting distillate?

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DEPARTMENT OF BIOTECHNOLOGY

6th Semester B.E. Biotechnology Engineering AY 2022-2023

Bioprocess Control and Automation (18BT61)

MODULE-1

1. Explain with neat sketch the principles and operation of pressure measuring instruments.
2. Explain with neat sketch the principles and operation of temperature measuring instruments..
3. Explain with neat sketch the principles and operation of flow measuring instruments.
4. Explain with neat sketch the principles and operation of liquid level measuring instruments.
5. Explain Flow injection analysis for substrate and product measurement.
6. Explain the working dynamics and control of bioreactors and sterilizers.
7. Explain the online measurement of the estimation of biomass.
8. Discuss the merits of online measurement.
9. Explain the online data analysis technique for biochemical process.
10. Write a note on measurement on physico-chemical and biochemical parameters.

MODULE-2

1. What are various input functions? Write their transforms.
2. Define and explain mathematically the following forcing functions and their laplace transforms:
   - Step input
   - Impulse Input
   - Ramp Input
   - Sinusoidal Input
   - Exponential Input
3. What are first order systems? What are the characteristics of first order systems.
4. A mercury thermometer is subjected to sinusoidal forcing input.Find an expression for its output.What inference can u draw from input and output.
5. How do you go about finding the response of non-linear system? Explain it with the assumptions made if any.
6. What is the effect of loading when two tanks having equal time constants and equal area of cross section are connected in series?
7. Derive an expression for the sinusoidal input to first order systems.What is the steady state solution for the same? Write important characteristics of output signal as compared to input signal.
8. Derive the transfer function for two non-interacting system in series.
9. Explain the effect of step response on two interacting system.

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MODULE-3

1. Derive the transfer function for manometer stating all assumptions
2. Derive the transfer function for spring damper stating all assumptions
3. What is rise time .
4. What is time constant.
5. Two first order processes with time constants 10 sec and 25 sec and gains 1.3 and 1 are in series. Design a proportional controller which would ensure a decay ratio of 0.5 in the closed loop response.
6. Explain under damped and critically system with the neat figure.
7. A step change of magnitude 4 is introduced into a system having Transfer function
   a. $\frac{Y(S)}{X(S)} = \frac{10}{S^2+1.6S+4}$
   b. Determine –
   c. i)Overshoot
   d. ii) Rise time
   e. iii)Ultimate value of Y(t)
   f. iv)Maximum value of Y(t)
   g. v) Period of Oscillation

MODULE-4

1. What is an Open loop system.
2. What is the Closed loop system.
3. What do you mean by positive and negative feed backsystem.
4. Give examples for positive and negative feed back system.
5. What id\s steady state error.
6. Derive the general overall transfer function with the help of block diagrams for a closed loop system forchange in set point andchange in the load
7. Draw a block diagram for the following servo problem. Controller is proportional valve of first order, measuring instrument has no lag. Find Kc(proportional gain) of the controller, for a crtically damped system. The gain of the valve and process both are 1, time constants are 2 and 10 seconds respectively.
8. Explain PI controller with the transfer function.

9. Explain PID controller with the transfer function.
10. Explain PD controller with the transfer function.
11. Explain the working of actuators and positioners,

MODULE-5

1. Define stability of the system.
2. Explain the criteria for the stability of the system in terms of roots of Characteristic equation.
3. Determine the value of K_c for which the system is stable by using Routh test.
4. Discuss the merits and demerits of the Routh's test.
5. Explain the rules for plotting Root locus diagrams.
6. Draw the root locus diagram for the open loop transfer function

$$G(s) = \frac{k}{(s+1)(s+2)(s+3)}$$

7. Consider the characteristic equation of a fourth-order system

$$s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$$

check the stability of the system using Routh - Hurwitz criteria

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Jul-Oct 2022

(12 week course)

Prof. Debjani Chakraborty

Coordinator, NPTEL

IIT Kharagpur

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DEPARTMENT OF BIOTECHNOLOGY

HANDS ON TRAINING WORKSHOP

CERTIFICATE

of Participation

proudly presented to

Ms. Annapareddy Trinayanireddy (USN: 1SG20BT008)

For his/her active participation in the 5 days Hands on Training Workshop on "CRISPR/CAS Gene Editing: Potential Tool in Therapy and Diagnostics" organized by Department of Biotechnology in association with VASLR from 15th to 19th May 2023 at SCE, Bengaluru

Prof. Ramya D L
Program Co-ordinators

Dr. Chaitra B S
Program Co-ordinators

Dr. Gokul Kesavan
CSO, VASLR

Dr. Veena S More

Dr. Ramakrishna H
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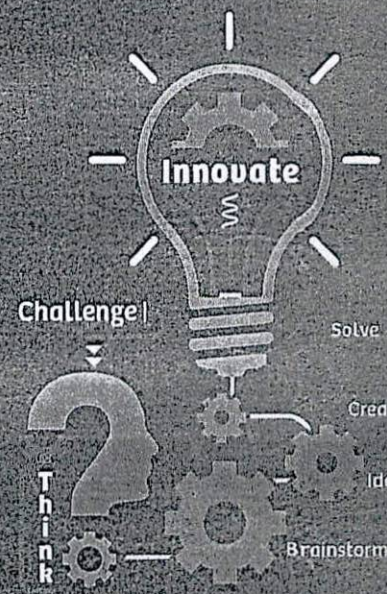
Innovation Think Tank Certification Program (ITTCP), India

August 02-09, 2023



Innovation Think Tank

Participant

Aishwarya Lomte

Sapthagiri College of Engineering, Bangalore

In recognition of your successful completion of the hybrid workshop organized by Innovation Think Tank, India and hosted by Siemens Healthineers in Bengaluru.

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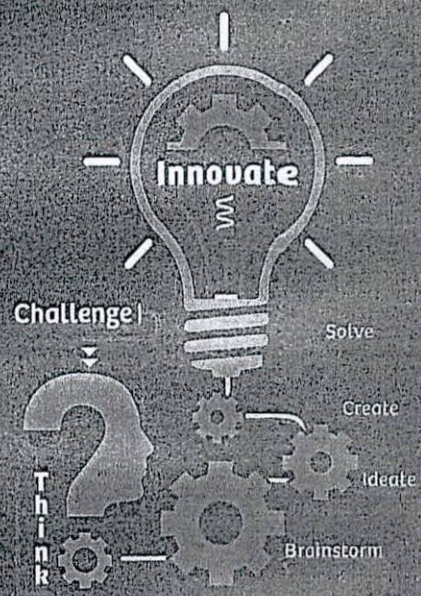
Dileep Mangsuli
Head, Development Center
Siemens Healthineers

Prof. Sultan Haider
Founder and Head of Innovation Think Tank
Siemens Healthineers
Erlangen, Germany

SIEMENS Healthineers

Innovation Think Tank Certification Program (ITTCP), India

August 02-09, 2023



Innovation Think Tank

Participant

Anjana G

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Dileep Mangsuli
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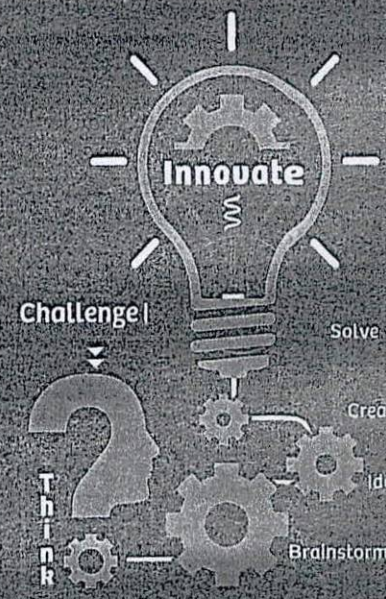
Prof. Sultan Haider
Founder and Head of Innovation Think Tank
Siemens Healthineers
Erlangen, Germany

SIEMENS Healthineers

Innovation Think Tank Certification Program (ITTCP), India

August 02-09, 2023



Innovation Think Tank

Winner - 2

AISHWARYA LOMTE

SAPTHAGIRI COLLEGE OF ENGINEERING

In recognition of your team's winning contribution at the hybrid workshop organized by Innovation Think Tank, India and hosted by Siemens Healthineers in Bengaluru.

Congratulations!

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Head, Development Center
Siemens Healthineers

Prof. Sultan Haider
Founder and Head of Innovation Think Tank
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Erlangen, Germany

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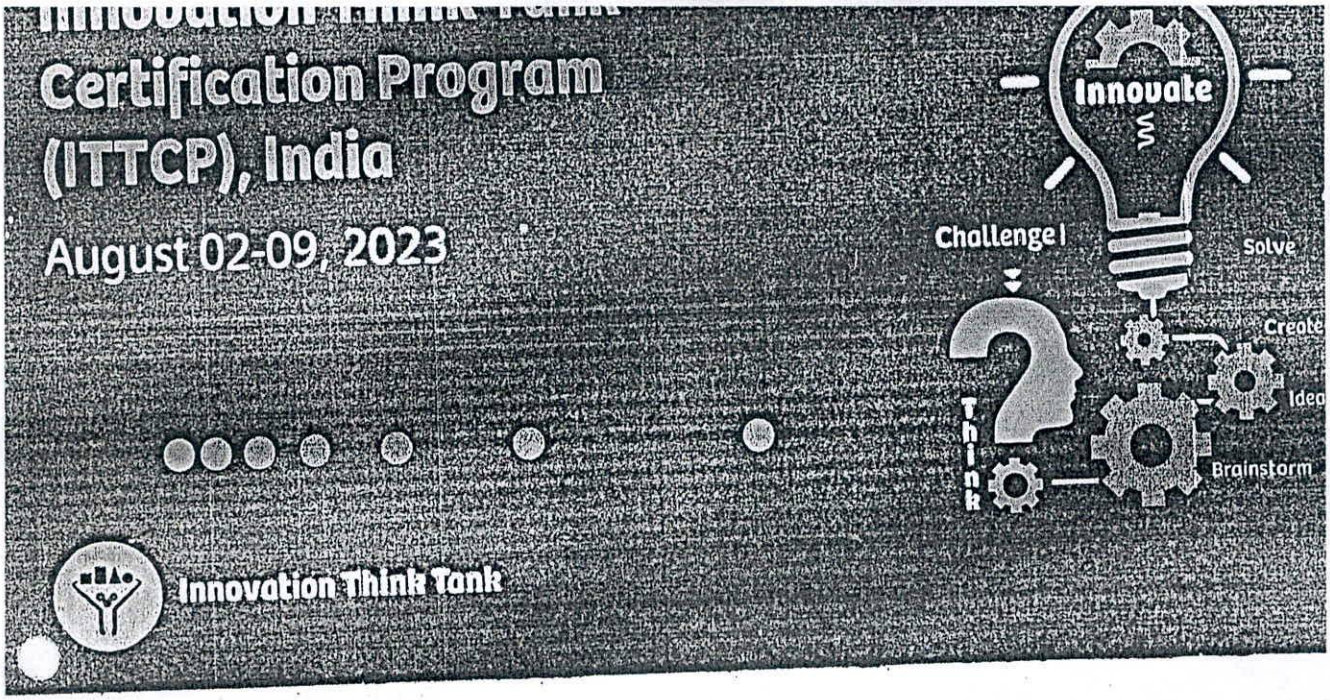

Participant

Janavi R

Sapthagiri College of Engineering, Bangalore

In recognition of your successful completion of the hybrid workshop-organize by Innovation Think Tank, India and hosted by Siemens Healthineers in Bengaluru.

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NPTEL Online Certification

(Funded by the MoE, Govt. of India)

This certificate is awarded to

SANJANA S S

for successfully completing the course

Dairy and Food Process and Products Technology

with a consolidated score of **69** %

Online Assignments	22.81/25	Proctored Exam	45.92/75

Total number of candidates certified in this course: **1335**

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Jul-Oct 2023

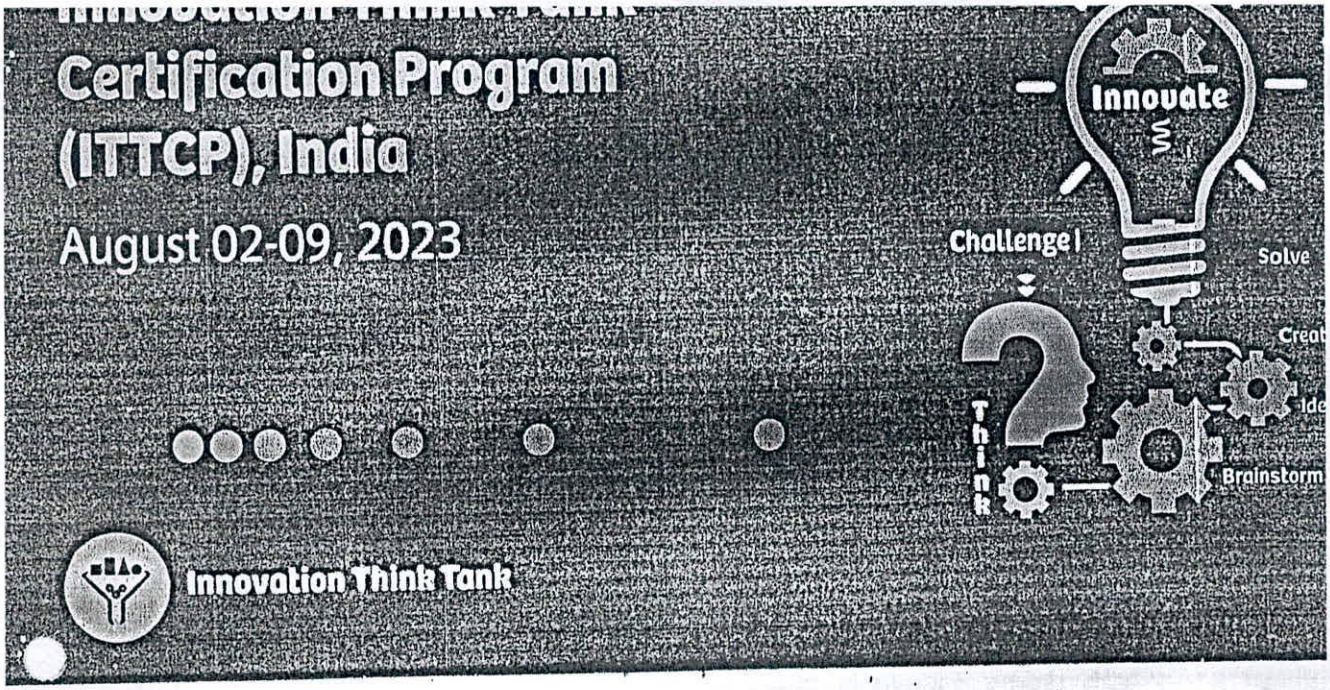
(12 week course)

Prof. Haimanti Banerji
Coordinator, NPTEL
IIT Kharagpur

Indian Institute of Technology Kharagpur

FREE ONLINE EDUCATION swayam शिक्षित भारत, उन्नत भारत

No: NPTEL23AG18S532305162 To verify the certificate No. of credits recommended: 3 or 4



Participant

Srinivasan R

Sapthagiri College of Engineering, Bangalore

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Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)

This certificate is awarded to

SANJANA S S

for successfully completing the course

Environmental Science

with a consolidated score of **66** %

Online Assignments	19.22/25	Proctored Exam	46.88/75

Total number of candidates certified in this course: **1238**

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Jul-Oct 2023

(12 week course)

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Coordinator, NPTEL
IIT Kharagpur

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DEPARTMENT OF BIOTECHNOLOGY

HANDS ON TRAINING WORKSHOP

CERTIFICATE

of Participation

proudly presented to

Ms. Priyanka V (USN: 1SG21BT041)

or his/her active participation in the 5 days Hands on Training Workshop o
CRISPR/CAS: Gene Editing: Potential Tool in Therapy and Diagnostic
rganized by Department of Biotechnology in association with VASLR from 15
o 19th May 2023 at SCE, Bengaluru

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Ms. Raksha K (USN: 1SG20BT042)

or his/her active participation in the 5 days Hands on Training Workshop o

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ganized by Department of Biotechnology in association with VASLR from 15t

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Ms. Chethana R (USN: 1SG20BT013)

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For his/her active participation in the 5 days Hands on Training Workshop o
'CRISPR/CAS - Gene Editing: Potential Tool in Therapy and Diagnostics
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Physics-Group (EC/EEE/ME /CV)

ODD SEMESTER TIME TABLE with effect from 12/12/2022

Department/Branch	CIVIL	Semester : 1	Section : CV-A
Academic Year	2022-23	Room No.	Civil block
Class Teacher	Shashikala B S		

Proctor : Nataraj A
Mob : 966349638
E-mail : natarajahn@sapthagiri.edu.in

PERIOD	1	2		3	4		5	6	7
TIME / DAY	8:30am - 9:30	9:30 - 10:30	10:30 - 10:50	10:50 - 11:50	11:50 - 12:50pm	12:50 - 01:45	01:45 - 02: 40	02:40 - 03:35	03:35 - 04:30pm
MON	22ETC15B	22PHYC12	SHORT BREAK	22ESC145	22ENG16	LUNCH BREAK	22PHYC12 (A1) Lab-2		
TUE	22ETC15B	22MATC11		22CIV13	22KSK17		22ESC145		
WED	22ESC145 (A1) Lab-2			22MATC11	22PHYC12		22CIV13		
THU	22MATC11 (A1) Lab-2			22CIV13	22KBK17				
FRI	22MATC11	22IDT18		22ESC145	22PHYC12		Mini Project		
SAT	22ETC15B	22PHYC12		22MATC11	22CIV13				

(Note: * → Tutorial Class)

Subjects Allocation

Subject Code		Subject Title	Faculty Name	Faculty Code
*ASC (IC)	22MATC11	Mathematics for Civil Engg stream-I	Anitha M	AM
#ASC (IC)	22PHYC12	Physics for Civil Engg stream	Dr. Harish R	HR
ESC	22CIV13	Engineering Mechanics	Kavya H P	KHP
ESC-I	22ESC145	Introduction to C Programming	Praneetha G N	PGN
ETC-I	22ETC15B	Green Buildings	Vinod Krishna Savadi	VKS
AEC	22ENG16	Communicative English	Pallavi T S	PTS
HSMC	22KSK17/22KBK17	Samskrutika Kannada/Balake Kannada	Lakshmi S	LS
AEC/SDC	22IDT18	Innovation and Design Thinking	Vinod Krishna Savadi	VKS

Dept. Time-Table Coordinator

HOD

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Time Table for 4th semester

Department/Branch	**Civil**	Semester: 4th	*Section: A*
Academic Year	**2022-23**	Room No:	**Geology Lab**
Class Teacher	**Prof. Santhosh R**		
Proctor: Prof. Santhosh R Mobile: 9845011660 E-Mail: Santhosh_r@sapthagiri.edu.in		Proctor: Prof. Priyanka A Mobile: 9060393712 E-Mail: priyanka_a@sapthagiri.edu.in	

PERIOD	1	2	BREAK	3	4	BREAK	5	6	7
TIME	8:30am – 9:30 am	9:30am – 10:30am	10:30am - 10:50am	10:50am - 11:50am	11:50am - 12:50pm	12:50pm - 1:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
DAY									
MON	21MAT41	21CV43	Short Break	21CV42	21UH49	Lunch Break	Forum Activity/ Mini Project		
TUE	21CV42	21CV43		21MAT41	21CV44		21CVL46(B2)		21KSK47
WED	21CV43	21MAT41		21CV43	21CV42		21CVL46(B1)		SPORTS
THU	21CV481	21CV42		21CV43	21CV44		21BE45	21CV42(B2)/21CV43(B1)	
FRI	21CV44	21CV44		21MAT41	21BE45				
SAT	21CV42(B1)/21CV43(B2)			21BE45	21KBK47				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
21MAT41	Complex Analysis, Probability and Statistical Methods.	New Faculty	NF
21CV42	Fluid Mechanics and Hydraulics (Integrated)	Bhavya C H/Pallavi G A	BCH/PGA
21CV43	Public Health Engineering (Integrated)	Nandini I V/Kavya H P	NIV/KHP
21CV44	Analysis of Structures	Santhosh R	S R
21BE45	Biology for Engineers	Nandini I V/ Vanishree S	NIV/VS
21CVL46	Earth Resources and Engineering Lab	Santhosh R / Vanishree S	SR/VS
21CV48X	Ability Enhancement Course - IV	Vinod krishna Savadi	VS
21UH49	Universal Human Values	Priyanka A	AP
21KSK37/47	Samskrutika Kannada	Lakshmi	AR
21KBK37/47	Balake Kannada	Lakshmi	RR

Time Table Coordinator

HOD

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S.C.E, Bangalore-560 057

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Time Table for 6th semester *ROOM NO.410*

Department/Branch	**Civil**	Semester: 6th	*Section: A*
Academic Year	**2022-23**	Room No:	**ALH-410**
Class Teacher	**Prof. Pallavi G A**		

Proctor: Prof. Pallavi G A
Mobile:9742229746
E-Mail: pallaviga@sapthagiri.edu.in

Proctor: Prof. Akshay J
Mobile:7899888989
E-Mail: akshayj@sapthagiri.edu.in

PERIOD	1	2	BREAK	3	4	BREAK	5	6	7
TIME / DAY	8:30am – 9:30 am	9:30am – 10:30am	10:30am - 10:50am	10:50am - 11:50am	11:50am - 12:50pm	12:50pm - 1:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
MON	18CV61	18CV645	Short Break	OE	18CV62	Lunch Break	18CVL66 (B1)/ 18CVL67(B2)		
TUE	OE	18CV62		18CV63	18CV61		18CVL66(B2)/ 18CVL67(B1)		
WED	18CV645	18CV63		OE	18CV62		18CVEP68		
THU	OE	18CV645		18CV61	18CV62		18CVEP68		
FRI	18CV61	18CV61		18CV62	18CV63		Forum Activity		
SAT	18CV63	18CV645		Mini Project					

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18CV61	Design of Steel Structural Elements	Prof. Priyanka A	AP
18CV62	Applied Geotechnical Engineering	Prof. Vanishree S	VS
18CV63	Hydrology and Irrigation Engineering	Prof. Bhavya c h	BCH
18CV645	Railway, Harbour, Tunneling & Airport	Prof. Akshay J	AJ
18CV656	Conservation of Natural Resources	Prof. Santhosh R/ Prof Pallavi G A	SR/PGA
18CVL66	Software Application Laboratory	Dr. Rajeshwari R/Prof. Priyanka A	RR/PA
18CVL67	Environmental Engineering Laboratory	Prof Nandini IV/Prof. Akshay J	NIV/AJ
18CVEP68	Extensive Survey Projects	All Faculties	
-----	Internship (Can be done in VI,VII & VIII)		

Time Table Coordinator

HOD 13/3/23

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Time Table for 8th semester

Department/Branch	**Civil**	Semester: 3rd	*Section: A*
Academic Year	**2022-23**	Room No:	**409**
Class Teacher	**Prof. Vanishree S**		

Proctor: Prof. Vanishree S Mobile: 9113594828 E-Mail: Vanishree_s@sapthagiri.edu.in	Proctor: Prof. Nandini I V Mobile: 7349424233 E-Mail: nandini@sapthagiri.edu.in	Proctor: Prof.Bhavya C H Mobile: 6362273890 E-Mail :bhavyach_civ@sapthagiri.edu.in

PERIOD	1	2	BREAK	3	4	BREAK	5	6	7
TIME	8:30am	9:30am	10:30am	10:50am	11:50am	12:50pm	01:45 pm	02:40 pm	03:35 pm
DAY	9:30 am	10:30am	10:50am	11:50am	12:50pm	1:45 pm	02:40 pm	03:35 pm	04:30 pm
MON	Project work phase-II		Short Break	Project work phase-II		Lunch Break	Project work phase-II		
TUE	Project work phase-II			Project work phase-II			Project work phase-II		
WED	Project work phase-II			Project work phase-II			Project work phase-II		
THU	Project work phase-II			Project work phase-II			Project work phase-II		
FRI	18CV824			18CV81			18CVS84		
SAT	18CV824			18CV81					

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18CV81	Design of Pre-Stressed Concrete Elements	Prof. Pallavi G A	PGA
18CV824	Retrofitting and Rehabilitation	Prof. Pramod K R	PKR
18CVP83	Project Work Phase - 2	Prof. Santhosh R	SR
18CVS84	Technical Seminar	Prof. Vanishree S	VS
18CVI85	Internship	Prof. Akshay J	AJ

Time Table Coordinator

21/02/23
HOD

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Principal
21/2/23

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QUESTION BANK 21CIV14

ELEMENTS OF CIVIL ENGINEERING AND ENGINEERING MECHANICS

MODULE 1

1. What is civil engineering? List out the different fields of Civil engineering.
2. State the scope of Surveying and Transportation Engineering.
3. State the scope of Geotechnical engineering and Structural engineering.
4. State the scope of Explain Environmental engineering and Hydraulics
5. State the scope of water resources and Irrigation engineering.
6. Explain the role of Civil engineers in Infrastructural development.
7. Explain the effect of infrastructural facilities on socio-economic development of a country.
8. Explain the classifications of Stone.
9. Mention the good qualities of a stone.
10. Mention the classification of Bricks.
11. Explain the engineering properties of Bricks.
12. Explain the manufacturing process of bricks.
13. Define concrete and write its applications.
14. List out the properties and applications of RCC and PSC.
15. List out the applications of GIS in civil engineering.
16. List out the properties and applications of the following building materials-
    a) Wood
    b) Glass
    c) Aluminium
    d) Cement
    e) Aggregates
    f) Steel

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QUESTION BANK

MODULE-4

1. Define support. Explain its types with a neat sketch.
2. Define load. Explain its types with a neat sketch.
3. Define Beam. Explain its types with a neat sketch.

MODULE-3

1.Define Centroid and Centre of gravity.

2.Derive the centroid equation for the following geometrical figures:

a) Triangle

b) Rectangle

c) Semicircle

d) Quandrant circle

Portions for 3rd IA- Module 3(Only Centroids) and Module 4

MODULE 5

1. State Newton's laws of motion.

2. Explain Rectilinear and Curvilinear motion.

3. Define displacement, distance travelled, velocity, Instantaneous velocity, Average velocity and acceleration. Mention their respective S I units.

4. Derive the equations of motion. (v=u+at, S=ut+1/2at2 and v2- u 2=2as).

5. What is super elevation? why it is necessary?

6. Define trajectory.

7. State and explain D'Alembert's Principle.

8. What is Projectile?

9. Define the following terms

a) Angle of Projection, b)Horizontal range c) Height of Projectile d) Time of Fligh

For Problems - Solve and practice all the problems in the notes

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DEPARTMENT OF CIVIL ENGINEERING

DATE : 30.11.2022

Subject : Geodetic Engineering Subject Code: 21CV32

1. Distinguish between a) Plane surveying and Geodetic Surveying b) Plan and Maps c) True meridian and Magnetic meridian d) WCB and QB
2. Explain the basic Principal of Surveying
3. Difference between Prismatic compass and Surveyor compass
4. Name and Explain important sources of Errors in Surveying.
5. Name and explain the various instruments for chaining in surveying.
6. Name and briefly explain temporary adjustments for Prismatic compass.
7. Define Local attraction and explain the elimination of Local attraction in compass surveying.
8. Define leveling and explain it
9. Explain the terms Fore Sight and Back Sight with neat sketch.
10. With the neat sketch explain the parts Dumpy Level.
11. Write about working operations of plane table surveying.
12. Differentiate between a) Dip and Declination b) Angle and bearing c) True meridian and magnetic meridian d) Maps and Plans
13. What is ranging? Explain the procedure of direct ranging with neat sketch.
14. Explain Radiation and Traversing methods of plane table surveying with neat sketches.
15. Describe with neat sketch two point problem in plane table surveying
16. Explain briefly Intersection and resection methods of plane table surveying with neat sketch.
17. Describe the different errors in plane table surveying.
18. Write advantages and disadvantages of plane table surveying.
19. Write a neat sketch of metric chain and its details.
20. Write briefly about classification of Surveying.

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4 marks question

16. Design a cantilever chajja with following data:
span = 1.2m, L.L. = 2 KN/m^2, floor finish = 1 KN/m^2, width of support = 230 x 400 mm beam. Draw the reinforcement details. Use 10 mm diameter bars Fe 415 and 6 mm diameter bars of Fe250. Use M 20 grade concrete.
17. A one way slab is to be designed for an effective span 3.3m. The super imposed load including finishing is 4 kN/m^2. Taking modification factor 1.2. Design the slab, sketch c/s. of slab showing reinforcement details. Use concrete M20 and steel Fe415.
18. Design simply supported R.C.C. slab over a passage of effective span 3.2m by using M25 concrete and Fe 415 steel .Assume super imposed load including floor finish as 3 KN/m^2 and M.F. = 1.4. Sketch the c/s.
19. A hall is 3m x 7m inside with walls 230mm thick. Design R.C. slab using M20 concrete and Fe 415 steel for total load of 5.5 KN/m^2. Check for shear and development length.
20. Design a slab for a hall of size 5.5m x 4m using M20 grade of concrete and Fe415 steel. Corners of slab are free to lift. Take live load of 2 KPa and floor finish load of 0.5KPa. Checks for shear, deflection and development length need not be taken. Use effective cover of 25mm. Take M.F. = 1.4.
21. Design a two way slab over a hall 4.5m x 5.5m effective. It is simply supported at from edges with corners held down. LL is 1.5 KN/m^2. Check for shear need not be given. Use M20 concrete and Fe415 steel. Use B.M. coefficients $\alpha_x = 0.086$ and $\alpha_y = 0.058$.

Unit 6- Design of Axially loaded short column (8 marks)

2 marks question

22. Write IS specifications for minimum eccentricity of an axially loaded short column.
23. State any four effective lengths of compression members as per clause E-3 along with this recommended values.
24. State any four functions of lateral ties in the column.
25. What are the assumptions made in limit state of collapse in compression?

4marks question

26. Design a RCC square footing for a column 400mm x 400mm to carry an axial load of 1200kN. Take SBC of soil as 200 KN/m^2 and density of soi as 18 KN/m^3. Use M20 concrete and Fe 415 steel. Check for punching shear and one way shear need not be given.
27. Design a column footing for following data. Load on column = 680 KN, size of column = 200mm x 300 mm, safe bearing capacity of soil = 150 KN/m^2. Concrete M20 and steel Fe 415.
28. Calculate load carrying capacity of column 300mm x 450mm in size reinforced with 4-16 mm ϕ bars and 4-12mm ϕ diameter bars. Use M20 and Fe45 steel.

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DEPARTMENT OF CIVIL ENGINEERING

HIGHWAY ENGINEERING -18CV56

ASSIGNMENT 3

(Module 4 & 5)

MODULE 4

PAVEMENT CONSTRUCTION

1. Explain the procedure of Rothfuch's method of aggregate gradation with the neat sketches.
2. Describe the step-by-step procedure followed in the subgrade / Embankment construction in pavements. Indicate the quality control tests to be performed before and after construction
3. Describe the step-by-step procedure followed in the construction of Granular Sub-base layer in pavements. Indicate the quality control tests to be performed before and after construction
4. Describe the step-by-step procedure followed in the construction of WBM Base layer in pavements. Indicate the quality control tests to be performed before and after construction
5. Describe the step-by-step procedure followed in the WMM Base layer construction in pavements. Indicate the quality control tests to be performed before and after construction
6. Describe the step-by-step procedure followed in the Bituminous layers construction in flexible pavements. Indicate the quality control tests to be performed before and after construction
7. Describe the step-by-step procedure followed in the PQC layer construction in Cement Concrete pavements. Indicate the quality control tests to be performed before and after construction

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MODULE 5

Highway Drainage & Highway Economics

1. Explain the significance/requirements of providing the highway drainage system.
2. Describe the surface drainage system provided along the highway with the neat sketches.
3. Describe the sub-surface drainage systems provided along the highway with the neat sketches.
4. Write a short note on i) Annual Cost- Method ii) Benefit cost ratio method.
5. Explain the major highway user benefits.

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DEPARTMENT OF CIVIL ENGINEERING

URBAN TRANSPORTATION & PLANNING -17CV751

MODULE 1 & 2

URBAN TRANSPORT PLANNING & DATA COLLECTION AND INVENTORIES

ASSIGNMENT 1

1. What is Transportation Planning?
2. Explain the various stages of transportation planning
3. Explain the systems approach of the planning process with a flow chart
4. Mention the various urban transit problems in India.
5. What is urbanization?
6. What are the characteristics of urbanisation?
7. Explain the various urban class groups.
8. Explain the concept of 'Interdependence of land-use and transportation'
9. Explain the various types of coordination of the transportation systems.
10. Describe the process of travel demand modelling with a flow chart.
11. Explain the different modes of Transportation.
12. Describe the Home interview survey for planning process
13. Describe the Registration number method of survey for planning process
14. Explain the various inventories conducted to assess transport facilities.
15. What is Study Area?
16. Explain the types of Zoning.
17. What are the various Sampling Techniques adopted in the data collection.
18. Describe the Commercial Vehicle survey of collection of data.
19. Explain the use of Secondary sources such as economy, income, population etc in classifying the data.

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URBAN TRANSPORTATION & PLANNING -17CV751

MODULE 3

TRIP GENERATION AND DISTRIBUTION

ASSIGNMENT 2

1. Explain the various factors governing the trip generation and attraction rates.
2. What are the assumptions in Multilinear Regression Analysis?
3. Define the Aggregated and Disaggregated Analysis
4. What is Category Analysis?
5. Mention the basic assumptions considered in the Category Analysis.
6. Mention the various categories of the basic three factors (Car ownership, Income & Household Structure) considered in category analysis
7. What is Trip Distribution?
8. Explain the concept of trip distribution with a neat matrix Diagram

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URBAN TRANSPORTATION & PLANNING -17CV751

MODULE 4 & 5

TRIP DISTRIBUTION & TRIP ASSIGNMENT

ASSIGNMENT 3

1. Define modal split? Explain in brief correction factors effecting modal split.
2. Draw the flow diagram for modal split carried out between trip generation and trip distribution.
3. What is opportunity method? Explain the methods of opportunity models.
4. Explain the modal split in urban transport planning.
5. The total trips produced in and attracted to the three zones A, B and C of a survey area in the design year are tabulated as follows.

Zone	Trips produced	Trips attracted
A	2000	3000
B	3000	4000
C	4000	2000

It is known that the trips between the two zones are inversely proportional to the second power of the travel time between zones, which is uniformly 20 minutes. If the trip interchange between zone B and C is known to be 600, calculate the trip interchange between zones A and B, A and C, B and A, C and A, C and B.

6. What is trip assignment? Write down the applications of trip assignment.
7. Explain the techniques of trip assignment.
8. Explain the main factors affecting the selection of land use transportation models.
9. Write a flow chart of fundamental structure of lowry model and explain the principal components of the model.
10. Explain the concept of 'Interdependence of land-use and transportation'

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Department of Civil Engineering

Sub: Design of Prestressed Concrete Structures
Sub Code: 18CV81

1. a) Define the following
   i) Tendon ii) Pre-tensioning iii) Post-tensioning

2. Define Pre-Stressed Concrete. Explain how PSC is more advantageous as compared to RCC.

3. An unsymmetrical I-Section beam is used to support an imposed load of 2kn/m over a span of 8m. The sectional details are top flange 300mm wide, 60mm thick. Bottom flange 100mm wide, 60mm thick. Thickness of the web 80mm, overall depth of the beam 400mm. At the center of the span the effective prestressing force of 100Kn is located at 50mm from the soffit of the beam. Estimate the stresses at the center of the span section of the beam for the following load combinations.i) Pre-stress+ Self weight ii) Pre-stress+ Self weight+ Live load .

4. A Pre-stressed concrete beam of section 100mm wide and 250mm deep is used over an effective span 8m to support a udl of 1.2kN/m. the beam is prestressed by a parabolic cable carrying a force of 250kN and located at an eccentricity of 40mm @ the center and zero eccentricity @ the supports.. Determine the location of pressure line in the beam and plot its position @ quarter, center and support sections.

5. A simply supported beam having span 6m is post tensioned by 2 cables both having eccentricity e=50mm at mid span. First cable is parabolic and anchored 100mm above CG at support. Second cable is straight. Cross section of each cable is 200mm2 and initial pre stress is 1200N/mm2. Area of cross section 2X104mm2 radius of gyration 120mm. The beam support a two point loads each 20Kn at mid third point. Ec=38Kn/mm2.Calculate i) short term deflection. ii) Long term deflection Take Ø=2, Loss of pre stress=20%

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Department of Civil Engineering

Sub: Design of Prestressed Concrete Structures
Sub Code: 18CV81

1. List and explain the various losses in pre tensioned and post tensioned beams.

2. A post tensioned concrete beam 100mm wide 300 deep spanning over 10m is stressed by successive tensioning and anchoring of 3 cables 1,2 and 3 respectively. The c/s area of each cable is 200mm2 and initial stress in the cable is 1200N/mm², m=6. The first cable is parabolic with an eccentricity of 50mm below the centroidal axis at the center of the span and 50mm above the centroidal axis about the support section. The second cable is parabolic with zero eccentricity at the support and an eccentricity of 50mm at the center of the span. The 3rd cable is straight having a uniform eccentricity of 50mm below the centroidal axis. Estimate the %age loss of stress in each of the cable if they are successively tensioned and anchored only due to elastic deformation.

3. A concrete beam having a rectangular cross section 150mm wide and 300mm deep is prestressed by a parabolic cable of eccentricity 75mm at the at the center of the span towards the soffit, and an eccentricity of 25mm towards the top at the support section. The effective force in the cable is 350kN. The beam supports the concentrated load of 20kN at the center of the span in addition to the self-weight. If the modulus of elasticity of the concrete is 38kN/m² and the span is 8m, Evaluate,
   (i)Short term deflection at the center of the span under prestress, dead load & live load.
   (ii)Long term deflection assuming a loss ratio as 0.8 and creep coefficient as 1.6.

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Department of Civil Engineering

Sub: Design of Prestressed Concrete Structures
Sub Code: 18CV81

1. Write a note on: a) Kern point b) Pressure line
2. A concrete beam having a rectangular section 150mm*300mm is prestressed by a parabolic cable at an eccentricity of 75mm at mid span towards bottom and at eccentricity of 25mm towards top at support sections. The effective prestressing force is 350 KN. the beam supports a concentrated load of 20KN at centre of span in addition to the self weight with a span at 8m. Find the short term deflection at centre of span under prestress, self weight and live load. Find also the long term deflection if the loss ratio is 0.8 and the creep coefficient is 1.6. E_c=38KN/mm²
3. A post tensioned concrete beam 100mm wide and 300mm deep is prestresssed by 3 cables, each with a cross sectional area of 50mm² and with an initial stress of 1200 N/mm². all the three cables are straight and located 100mm from the soffit of the beam. if the modular ratio is 6. Calculate the loss of stress in the three cables due to elastic deformation of concrete for only the following cases.
   a) Successive tensioning of the three cables one at a time.
   b) Simultaneous tensioning and anchoring of all the three cables.

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29. Design a square column with the following data:

i. Factored load = 3000 kN
ii. Concrete grade = M20
iii. Steel = Fe415
iv. Unsupported length of column = 3m
v. %steel for main bars = 1%
Check for minimum eccentricity.

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DEPARTMENT OF CIVIL ENGINEERING

18CV645-RAILWAYS ,HARBOUR, TUNNELING AND AIRPORT ENGINEERING

QUESTION BANK:MODULE -1

1.	Define Permanent way.	BT 1
2.	List out the elements of permanent way.	BT 1
3.	Define creep of rail and mention its causes.	BT 1
4.	Define fish plate. Why is it named so?	BT 1
5.	Define transition curve and list its types.	BT 1
6.	Define obligatory points	BT 1
7.	Distinguish between double headed and bull headed rail	BT 2
8.	Differentiate cant and negative cant.	BT 2
9.	Describe in short about pusher gradient.	BT 2
10.	Differentiate right hand and left hand turnout.	BT 2
11.	Classify the stresses produced in a railway track.	BT 3
12.	Classify the methods of survey that should be done for track alignment.	BT 3
13.	A B.G. railway track is designed for a ruling gradient of 1 in 200 on a curve of 2°. Calculate its grade compensation.	BT 3
14.	Explain what is a turnout and why it is required.	BT 4
15.	Compare Creep and Kink in Rails.	BT 4
16.	Explain the basic requirements of an ideal rail joint.	BT 4
17.	Draw a neat sketch of a permanent way and mark its parts.	BT 5
18.	What is to be done if the resistance in gradient is exceeding beyond the allowable limit.	BT 5
19.	What are the factors to be considered in selecting the sleeper density?	BT 6
20.	Under what situation is points and crossings recommended.	BT 6

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PART B

1. Describe in detail about the types of rail joints, rail fixtures and fasteningused in atrack
2. When and where the soil suitability analysis is carried out andexplain
3. Definegradient andsuperelevation;Listoutitstypesandexplainclearly.
4. Compare and contrast the different type of sleepers used in Indianrailways.
5. Discuss in detail about points andcrossings.
6. i. A BG curved railway track has a 4° curvature and 12cm cant. Maximum Permissible speed on the curve is 85Km/hr. Calculate the length of the transitioncurve. BT3
   i. An 8° curve track diverges from a main curve of 5° in an opposite direction in the layout of a B.G. yard. Calculate the super elevation and the speed on the branch line, if the maximum speed permitted on the main line is 45Km/hr.
7. i. Derive an expression to establish the relationship among gauge, speed, radius of curvature andsuperelevation (8marks) BT3
   i. Explain in detail the importance of Indian Railways in the National Development in terms of economic, social and politicalcontributions. (8 marks) BT4
8. Explain in detailabout BT4
   (a) BallastlessTrack (4 marks)
   (b) Negative super elevation. (4marks)
   (c) Widening ofgauge (4marks)
   (d) GradeCompensation (4marks)
9. Design and draw a neat sketch of permanent way cross section andexplainthe functions of its components. BT5
10. Compare the conventional and modern methods of surveying for routealignmentand justify which one is thebest.

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MODULE-2

1.	List out the methods used for stabilization of tracks in poor soil.	BT 1
2.	Define formation.	BT 1
3.	List out the methods of tunneling construction	BT 1
4.	When is a branch line called as siding?	BT 1
5.	List out the materials required for laying of track.	BT 1
6.	Where is a marshaling yard provided?	BT 1
7.	Summarize the stages in construction of a railway track	BT 2
8.	Differentiate metro and mono railway system.	BT 2
9.	Estimate the number of rails required per Km of railway track.	BT 2
10.	Describe shortly about passenger platform	BT 2
11.	Classify the types of railway stations	BT 3
12.	Relate the importance of construction and maintenance of tracks.	BT 3
13.	Classify the methods of plate laying.	BT 3
14.	Explain why ventilation should be provided in tunneling.	BT 4
15.	Compare the pros and cons of daily maintenance and periodic maintenance.	BT 4
16.	Classify the types of marshaling yards.	BT 4
17.	What are all the factors is to be considered if a railway station is to be constructed.	BT 5
18.	Design and draw a neat sketch of a junction station.	BT 5
19.	Under what circumstances does a wayside station be selected	BT 6
20.	Summarize the operations to be carried out for drainage in tunnelling	BT 6

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MODULE 3

1.	List the components of an airport.	BT 1
2.	List the components of an aircraft.	BT 1
3.	Tell the advantages of air transport.	BT 1
4.	Write the objectives of airport master plan	BT 1
5.	Write the airport parking configuration	BT 1
6.	Describe the general classification of airport.	BT 1
7.	Distinguish terminal apron and cargo apron	BT 2
8.	Predict why regional planning is to be done.	BT 2
9.	Discuss the characteristics of airport layout.	BT 2
10.	Summarize the four groupings of Aircraft parking system?	BT 2
11.	Illustrate what is a hangar and mention its types.	BT 3
12.	Show the outline of ICAO master planning process	BT 3
13.	Classify airport codes based on aircraft wheel load.	BT 3
14.	Drawings for layout plan for an airport - explain	BT 4
15.	Comment on the sequence of passenger flow in an airport.	BT 4
16.	Analyze the importance of preplanning for an airport project.	BT 4
17.	Prepare a typical layout of airport for a single runway and two parallel runways	BT 5
18.	Prepare a list of data's to be collected before site selection.	BT 5
19.	Summarize how the size of gate position decided.	BT 6
20.	Recommend the criteria for site selection.	BT 6

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MODULE-4

PART A

1.	How orientation of runway is done? On what basis it is decided.	BT 1
2.	What is a wind rose diagram?	BT 1
3.	List the elements to be considered in the Geometric design of runways.	BT 1
4.	Describe bypass taxiway	BT 1
5.	Define clear zone.	BT 1
6.	Define turning zone	BT 1
7.	Differentiate runway and taxiway	BT 2
8.	Differentiate between VFR and IFR.	BT 2
9.	Discuss airport markings	BT 2
10.	Differentiate type I and type II wind rose diagram.	BT 2
11.	Illustrate the purpose of installing visual aids in a airport	BT 3
12.	Classify the cases that are to be considered in deciding the basic runway length.	BT 3
13.	Show the importance of various imaginary surfaces around the airport.	BT 3
14.	Explain the term cross wind components and wind coverage.	BT 4
15.	Classify the elements of airport lightings.	BT 4
16.	Air traffic control aids- explain	BT 4
17.	Integrate zoning laws	BT 5
18.	Prepare the list of factors affecting runway capacity	BT 5
19.	Turning radius in a taxiway is decided based on?	BT 6
20.	Explain the factors to be considered in locating exit taxiways.	BT 6

PARTB

1.	What are the items to be considered in the geometric design of runway and explain it in detail.	BT 1
2.	Describe about the geometric design standards of taxiway and also explain Exit taxiway.	BT 1
3.	Explain what are different control surfaces at an airport? Explain the concepts of airport zoning with the help of sketches.	BT 1

4.	i.	Discuss the factors to be considered while selecting a suitable site for the construction of aport?	BT 2
	ii.	Distinguish Between Pier Wharf. Explain their utility with thehelp ofsketches?	
5.	i.	What are the functions of wet Docks? Explain withSketches, their working & mainfeatures.	BT 2
	ii.	Explain with sketch the features of a compositeBreakwater	
6.		Classify harbours on broad basis and on the basis of utility and explain them.	BT 3
7.		(i).Classify different types of break water. Explain any one in brief.	BT3
		(ii) Define a port and bring out the differences between a port and a harbor. What are the requirements of good port?	BT4
8.		Explain the facilities to be provided in a port.	BT 4
9.		Discuss the tides and wave effects and its action on coastal structures.	BT 5
10.		Explain clearly about the coastal regulation zone,2011.	BT 6

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MODULE 5

1.	How is breakwater classified?	BT 1
2.	Write in short about the features of port.	BT 1
3.	List source of the special types of break water.	BT 1
4.	What do you understand by littoral drift?	BT 1
5.	What is a graving dry dock.	BT 1
6.	Why a shore protection work is needed?	BT 1
7.	Differentiate Quay and Pier	BT 2
8.	Distinguish between diurnal and semi-diurnal tides	BT 2
9.	Describe wharf? Name the types	BT 2
10.	Distinguish between Dolphins & Jetties	BT 2
11.	Classify Harbour based on location.	BT 3
12.	Illustrate coastal shipping with an example	BT 3
13.	Mention any two erosion protection Methods in Coastal Zone?	BT 3
14.	Mention some of the features of a harbour	BT 4
15.	Explain Breakwater	BT 4
16.	How to design the entrance of a harbor?	BT 4
17.	Prepare the list of requirements that is to be considered during design of port.	BT 5
18.	How is Inland Water Transport different from sea transport?	BT 5
19.	Summarize about marine survey.	BT 6
20.	Summarize the requirements of good port?	BT 6

PARTB

1.	Draw a neat sketch of a harbour layout & show the Various Components. Mention the objectives of each.	BT 1
2.	What is a fender. Explain in detail about its types and classification.	BT 1
3.	Define dredging? Explain the reasons for its adoptions. How dredged Materials are disposed off?	BT 1

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DEPARTMENT OF CIVIL ENGINEERING

HIGHWAY ENGINEERING -18CV56

MODULE 1

PRINCIPLES OF TRANSPORTATION ENGINEERING, HIGHWAY DEVELOPMENT & PLANNING, HIGHWAY ALIGNMENT & SURVEYS

ASSIGNMENT 1

1. Define Transportation. Describe the social effects of Transportation.
2. Describe the impact of rural roads connectivity in the development of rural areas of India.
3. Explain the different modes of transportation with their advantages & Disadvantages.
4. Describe the characteristics of the Road Transportation
5. What is Jayakar Committee? State the Jayakar committee recommendations for the development of road infrastructure in India.
6. Write a short note on:
   a) Central Road Fund (CRF)
   b) Indian Roads Congress (IRC)
   c) Central Road Research Institute (CRRI)
7. What are the various objectives of 'Highway Planning'?
8. Describe the broad classification of roads based on various aspects. Explain briefly.
9. What are the various types of road patterns? Explain briefly with a neat sketch.
10. What do various studies constitute the 'Planning survey'? Explain briefly.
11. Define a 'Master Plan'. Mention the various stages in preparation of a 'Master Plan'.
12. Describe the salient features of the 3rd Twenty-year Road development plan.
13. Explain the following with respect to the present scenario of Road development in India and Karnataka
    i) NHDP ii) KSHIP iii) PMGSY iv) KRDCL
14. Mention the salient features of 'Road Development Plan: Vision 2021'.
15. What are the factors affecting an Ideal Alignment?
16. What are obligatory Points? Explain.

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17. Briefly explain the major engineering surveys to be conducted for fixing a Highway Alignment.
18. What are the conventional methods used to conducted preliminary survey? Explain briefly.
19. Brief the major points to be considered in fixing the final alignment.
20. What are the major steps to be followed in a new highway project?
21. Explain the necessity or requirement for Re-Alignment of a Highway?
22. Describe the major general principles to be followed in a Re- Alignment project.
23. Mention the major steps in a Re-alignment project.

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HIGHWAY ENGINEERING -18CV56

MODULE 2 & 3

HIGHWAY GEOMETRIC DESIGN & PAVEMENT MATERIALS

ASSIGNMENT 2

1. Explain the major factors affecting Highway Geometric Design.
2. What are the important Surface Characteristics of the pavement? Explain Briefly.
3. What is Camber? Explain the types of Camber with a neat sketch.
4. What is Stopping Sight Distance? Explain the factors on which SSD depends.
5. What is Overtaking Sight Distance? Explain the factors affecting OSD.
6. What is Super-Elevation? Explain the steps for the design of Super-Elevation.
7. What are the Desirable properties of the soil? Explain briefly.
8. Explain the brief procedure to find out the CBR of the given sample if soil with a neat sketch.
9. Explain the brief procedure to find out the Modulus of Subgrade Reaction(K) of the given sample if soil with a neat sketch.
10. What are the desirable properties of Aggregates as a Highway material? Explain briefly
11. What are the desirable properties of Bitumen as a Highway material? Explain briefly
12. Differentiate between Bitumen & Tar
13. Define Emulsion & Cutback? Explain with the types.
14. Define Pavement? Differentiate between flexible & Rigid Pavement.
15. Explain the component layers of the flexible pavement with neat sketch with their functions.
16. Explain the component layers of the Rigid pavement with neat sketch with their functions.
17. What is ESWL? Explain the determination of ESWL using graphical Method with a neat sketch.

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Department of Computer Science & Engineering

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Academic Year 2022-23 EVEN

EVEN semester TIME-TABLE with effect from 05 /06/2023

Department/Branch	CSE	Semester:IV	Section : A
Academic Year	2022-23	Room No.	108
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PERIOD	1	2		3	4		5	6	7
TIME	8:30AM – 9:30AM	9:30AM – 10:30AM	10:30 -10:50	10:50AM - 11:50AM	11:50AM -12:50PM	12:50 - 01:45	01:45PM - 02:40PM	02:40PM - 03:35PM	03:35PM - 04:30PM
DAY									
MON	OS	DAA	SHORTBREAK	MC	M4	LunchBreak (55minutes)	TUT		
TUE	DAA	M4		CPH	OS		BIO	A1 DAA LAB/ A2 MC LAB / A3 PY LAB	
WED	M4	OS		A2 DAA LAB/ A3 MC LAB / A1 PY LAB					
THU	A3 DAA LAB/ A1 MC LAB / A2 PY LAB			DAA	MC				
FRI	UH	M4		OS	MC		DIP MATHS		
SAT	MC	DAA		AEC	BIO				

SubjectsAllocation

Subject Code	Subject Title	Faculty Name	Faculty Code
21CS41	Mathematical Foundations for Computing	Prof. Nandhini B J	NB
21CS42	Design and Analysis of Algorithms	Prof. Poornima G J	PGJ
21CS43	Microcontroller and Embedded Systems	Prof. Chaitra P	CP
21CS44	Operating Systems	Prof. Hemalatha K	HK
21BE45	Biology For Engineers	Prof. Sowmya	SB
21CSL46	Python Programming Laboratory	Prof. Shwetha A B	SAB
21CIP37/47	Constitution of India & Professional Ethics		
21CS48X/21CSL48X	Ability Enhancement Course- IV	Prof. Bhanujyothi H C	BJ
21UH49	Universal Human Values	Prof. Vyshnavi M	VM
	Design and Analysis of Algorithms Lab	Prof. Poornima G J, Prof. Roopa Banakar	PGJ, RB
	Microcontroller and Embedded Systems Lab	Prof. Chaitra P , Prof. Kruthi T C	CP,KTC

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Academic Year 2022-23 EVEN

EVEN semester TIME-TABLE with effect from 05/06/2023

Department/Branch	CSE	Semester:IV	Section : B
AcademicYear	2022-23	Room No.	109
ClassTeacher Name	Prof.HEMALATHA K		

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PERIOD	1	2		3	4		5	6	7
TIME	8:30AM – 9:30AM	9:30AM – 10:30AM	10:30 - 10:50	10:50AM -11:50AM	11:50AM - 12:50PM	12:50 - 01:45	01:45PM -02:40PM	02:40PM -03:35PM	03:35PM - 04:30PM
DAY									
MON	MC	M4	SHORTBREAK	OS	DAA	LunchBreak (55minutes)	BIO	B1 DAA LAB/ B2 MC LAI PY LAB	
TUE	B2 DAA LAB/ B3 MC LAB / B1 PY LAB			DAA	CPH		TUT		
WED	DAA	MC		M4	BIO				
THU	M4	MC		OS	UH				
FRI	OS	MC		B3 DAA LAB/ B1 MC LAB / B2 PY LAB					
SAT	AEC	M4		OS	DAA				

SubjectsAllocation

Subject Code	Subject Title	Faculty Name	Faculty Co
21CS41	Mathematical Foundations for Computing	Prof. Nandhini B J	NB
21CS42	Design and Analysis of Algorithms	Prof. Poornima G J	PGJ
21CS43	Microcontroller and Embedded Systems	Prof. Chaitra P	CP
21CS44	Operating Systems	Prof. Hemalatha K	HK
21BE45	Biology For Engineers	Prof. Sowmya	SB
21CSL46	Python Programming Laboratory	Prof. Lavanya	LK
21CIP37/47	Constitution of India & Professional Ethics		
21CS48X/21CSL48X	Ability Enhancement Course- IV	Prof. Bhanujyothi H C	BJ
21UH49	Universal Human Values	Prof. Vyshnavi M	VM
	Design and Analysis of Algorithms Lab	Prof. Roopa Banakar, Prof. Poornima G J	RB, PGJ
	Microcontroller and Embedded Systems Lab	Prof. Kruthi T C, Prof. Chaitra P	KTC, CP

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Department of Computer Science & Engineering

F-TLP-02/R0
Academic Year 2022-23 EVEN

TENTATIVE EVEN semester TIME-TABLE with effect from 20/03/2023

Department/Branch	CSE	Semester : VI	Section : A
Academic Year	2022-23	Room No.	110
Class Teacher Name	Prof. Roopa Banakar		

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Proctor : Dr Praveen Kumar K V
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PERIOD	1	2		3	4		5	6	7
TIME	8:30AM – 9:30	9:30 – 10:30	10:30 – 10:50	10:50 – 11:50	11:50 – 12:50PM	12:50 – 01:45	01:45 – 02:40	02:40 – 03:35	03:35 – 04:30PM
DAY									
MON	CC	CG	SHORT BREAK	Open Elective	SS	Lunch Break (55 minutes)	A1 SS / A2 CGV/A3 MAD LAB		
TUE	Open Elective	A2 SS / A3 CGV/A1 MAD LAB		A2 SS / A3 CGV/A1 MAD LAB			TUTORIAL		
WED	WT	SS		Open Elective	CC		A3 SS / A1 CGV/A2 MAD LAB		
THU	Open Elective	WT		CG	CC		TUTORIAL		
FRI	SS	CG		WT	CC		PLACEMENT TRAINING		
SAT	CG	WT		SS	TUT				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18CS61	System Software and Compilers	Dr. Lavanya N L	LNL
18CS62	Computer Graphics and Visualization	Dr. Kamalakshi Naganna	KNL
18CS63	Web Technology and its applications	Dr. Praveen Kumar K V	PKV
18CS641	Cloud Computing	Prof. Roopa Banakar	RB
18CS65X	Open Elective	Other Branches Faculties	
18CSL66	System Software Laboratory	Prof. Madhushree	MD
18CSL67	Computer Graphics Laboratory with mini project	Prof. Shashi Rekha G	SG
18CSMP68	Mobile Application Development	Prof. Hemalatha K	HK

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Department of Computer Science & Engineering

F-TLP-02/R0
Academic Year 2022-23 EVEN

TENTATIVE EVEN semester TIME-TABLE with effect from 20/03/2023

Department/Branch	CSE	Semester : VI	Section : B
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PERIOD	1	2		3	4		5	6	7
TIME	8:30AM - 9:30	9:30 - 10:30	10:30 - 10:50	10:50 - 11:50	11:50 - 12:50PM	12:50 - 01:45	01:45 - 02:40	02:40 - 03:35	03:35 - 04:30PM
DAY									
MON	CG	SS	SHORT BREAK	Open Elective	TUT	Lunch Break (55 minutes)	TUTORIAL		
TUE	Open Elective	CG		CC	WT		B1 SS / B2 CGV/B3 MAD LAB		
WED	CC	CG		Open Elective	SS		TUTORIAL		
THU	Open Elective	CC		SS	WT		B3 SS / B1 CGV/B2 MAD LAB		
FRI	WT	B2 SS / B3 CGV/B1 MAD LAB		B2 SS / B3 CGV/B1 MAD LAB			PLACEMENT TRAINING		
SAT	SS	CG		CC	WT				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18CS61	System Software and Compilers	Dr. Lavanya N L	LNL
18CS62	Computer Graphics and Visualization	Prof. Sheela Rani C M	SR
18CS63	Web Technology and its applications	Dr. Praveen Kumar K V	PKV
18CS641	Cloud Computing	Prof. Roopa Banakar	RB
18CS65X	Open Elective	Other Branches Faculties	
18CSL66	System Software Laboratory	Dr. Lavanya N L, Dr Praveen Kumar K V	LNL,PKV
18CSL67	Computer Graphics Laboratory with mini project	Prof. Sheela Rani C M	SR
18CSMP68	Mobile Application Development	Prof. Vanitha G P	VGP

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Academic Year 2022-23 EVEN

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Department/Branch	CSE	Semester : VIII	Section : A
Academic Year	2022-23	Room No.	108
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PERIOD	1	2		3	4		5	6	7
TIME DAY	8:30AM – 9:30AM	9:30AM – 10:30AM	10:30 - 10:50	10:50AM - 11:50AM	11:50AM - 12:50PM	12:50 - 01:45	01:45PM - 02:40PM	02:40PM - 03:35PM	03:35PM - 04:30PM
MON	INTENSHIP		SHORT BREAK	INTENSHIP		Lunch Break (55 minutes)	INTENSHIP		
TUE	SEMINAR			SEMINAR			SEMINAR		
WED	PROJECT			PROJECT			PROJECT		
THU	PROJECT			PROJECT			PROJECT		
FRI	IOT	SAN		IOT	SAN		FORUM		
SAT	SAN	IOT		SAN	IOT				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18CS81	Internet of Things	Prof. Madhushree	MD
18CS822	Storage Area Networks	Prof. Shashi Rekha G	SRG
18CSP83	Project Work Phase	Dr. Lavanya N L, Prof. Anuradha B	LNL,AB
18CSS84	Technical Seminar	Prof. Roopa Bankar, Prof. Sheela Rani	RB,SR
18CSI85	Internship	Prof. Divyamani , Prof. Hemalatha K	DM,HK

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Academic Year 2022-23 EVEN

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Department/Branch	CSE	Semester : VIII	Section : B
Academic Year	2022-23	Room No.	109
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TUE	SEMINAR			SEMINAR			SEMINAR		
WED	PROJECT			PROJECT			PROJECT		
THU	PROJECT			PROJECT			PROJECT		
FRI	SAN	IOT		SAN	IOT		FORUM		
SAT	IOT	SAN		IOT	SAN				

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Subject Code	Subject Title	Faculty Name	Faculty Code
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Academic Year: EVEN/2022- 2023 **F-IAT-06/R0**

SUBJECT :Automata Theory & Computation **SUB CODE:18CS54**

QUESTION BANK

MODULE 1

1. Define the following terms with examples:
   i. Alphabet
   ii. Power of an alphabet
   iii. Concatenation,
   iv. Languages

2. Draw a DFA to accept strings of a's and b's ending with 'bab'.

3. Convert the following NDFSM to its equivalenDFSM.

4. Define distinguishable and indistinguishable states, Minimizethe following DFSM,

S	0	1
A	B	A
B	A	C
C	D	B
*D	D	A
E	D	F
F	G	E
G	F	G
H	G	D

5. Write differences between DFA, NFA an ε-NFA.

6. With a neat diagram, explain a hierarchy of language classes in automata theory.

7. Define deterministic FSM. Draw a DFSM to accept decimal strings which are divisible by 3.

8. Convert the following NDFSM to its equivalent DFSM Also write transition table for DFSM.

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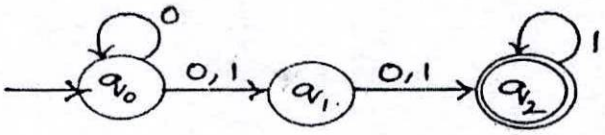
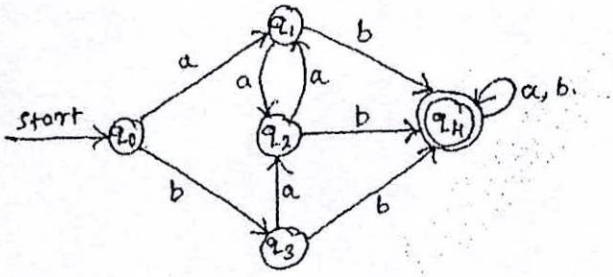
9. Design a DFSM to accept each of the following languages:
   a. L = {W ∈ {0, 1}* : W has 001 as a substring}
   b. L = {W ∈ {a, b} *: W has even number of a's and even numberof b's}.

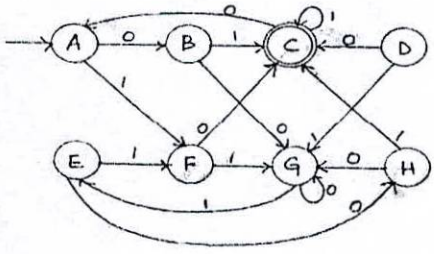
10. Define NDFSM. Convert the following NDFSM to itsequivalent DFSM.



11 Minimize the following DFSM



12. Minimize the following finite automata



13. Define DFA. Construct the DFA for the following languages:
   a. String of a's and b's ending with abb.
   b. L= { w/ |w| mod S=0 } on = { a}

14. Consider the following ∈ – NFA

δ	∈	a	b
→ P	{r}	{q}	{p, r}
q	Φ	{p}	Φ
*r	{p, q}	{r}	{p}

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a. Compute the Є -closure of each state
b. Give the set of all strings of length 3 or less accepted by the automation.

15. Define Finite automata. Write the application of finite automata.

16. Design a DFA to accept the following language over thealphabet {0, 1}.

i. $L=\{(01)^i .2^j \mid i>=1, j>=1\}$
ii. $L=\{\infty:|\infty| \text{mod} 3=|\infty| \text{mod} 2\}$

17. What is NFA? Explain with example.

18. Consider the following Є-NFA

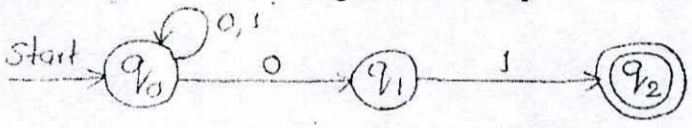
δ	ε	a	b	c
→p	ϕ	p	q	r
q	p	q	r	ϕ
*r	q	r	ϕ	p

a. Compute Є-closure of each state
b. Convert the automata to DFA

19. Define DFA. write the DFA's for the following languages on

i. Σ = {a, b}. The set of all strings containing the substring 'ab'.
ii. L: {∞|[∞] mod 3 = 0}

20. Convert the following NFA to its equivalent DFA.



21 What is Automata? Discuss why study automata ?

22. Design a DFA to accept the language L = {W / W is of even length and begins with 01}

23. Design the NFA-Є or NFA forthe languages given below:

a. abc, abd and aacd {Assume Σ= a, b, c, d }

24. Mention the differences between DFA. NFA and NFA-Є

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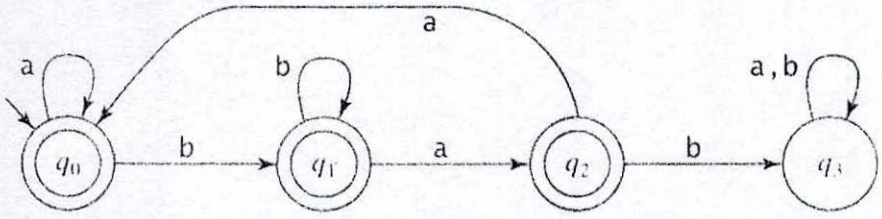
MODULE 2

1. Define regular expression. Briefly explain the applications of regular expression.
2. Convert following RE's into FSM's

   a. (ab*)*
   b. (a U b)*
   c. a*U b*
   d. (aUb)ab

3. Convert following FSM's to RE's



4. Write regular expressions for the following

   i) {w € {a,b}* with atmost one a}
   ii) {w € {a,b}* doesnot end with ba}
   iii) {w € {0,1}* has substring 001}
   iv) {w € {0,1}* |w| is Even}

5. State and prove pumping lemma theorem for regular languages and show that the Language L={a^n b^n : n>=0} not regular.

6. Explain the closure properties of Regular Languages

7. What is Regular grammar? Write RG, FSM for given language.

L= {w € {a,b}* : every a in w is immediately followed by atleast one b }

8. Write FSM for the given Regular grammar?

   S→ OA | 1B | 0 | 1

   A→0S | 1B | 1

   B→0A | 1S

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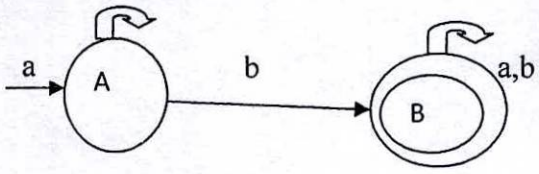
9. Write Regular Grammar for the given FSM?



MODULE 3

1. Write the CFG for following languages.

   a. L= $\{a^{n+3} b^n \mid n>=1 \}$

   b. L = $\{a^n b^m\} \neq m : n$

   c. L=$\{ww^R \mid w \varepsilon\{a,b\}^*\}$

2. Simplify following CFG.

   S→AB |AC

   A→ aA |bAa|a

   B→ bbA|aB|AB

   C→ aCa|aD

   D→ aD|bC

3. Consider the CFG with productions

   $E \rightarrow E+T \mid T$

   $T \rightarrow T*F \mid F$

   $F \rightarrow (E) \mid 0 \mid 1$

Write LMD, RMD and parse tree for the string 0+((1*0)+0)

4. Consider the grammar:

   $S \rightarrow aS \mid aSbS \mid \varepsilon$

Is the above grammar ambiguous? Show that the string "aab" has two

i) Parse trees

]

ii) ii) Left most derivations
iii) iii) Right most derivations

5. Convert the following grammars to Chomsky normal form.

S→ABC

A→aC | D

B→bB |€ |A

C→Ac | € |Cc

D→aa

6. Convert the following grammars to Chomsky normal form.

S→aTVa

T→aTa | bTb | € | V

V→ cVc |

MODULE 4 & 5

1.Define PDA. Design a PDA to accept the following language. L= { $a^n b^n$; n > = 1}. Draw the transition diagram for the constructed PDA. Show the ID's for the string aaabbb.

2.Explain the Model of Linear Bounded Automata?

3.Design a Turing machine to accept L={$0^n1^n2^n$| n>=1}. Draw the transition diagram. Show the moves made for string 001122.

4. Define Turing Machine? With diagram explain the working of Turing Machine.

5. Briefly explain the technique for Turing Machine construction?

6. With diagram explain the Variants of Turing Machine?

7. Write short notes on

(i)Post correspondence problem

(ii) Halting Problem in Turing Machine

]

(iii) Growth rate function

(iv) Church turing thesis

8. Prove that " $HALT_{TM}$ ={(M,W) | The Turing Machine M Halts

9. Explain Decidable Language with example?

10. Explain Quantum Computer?

11. Explain recursively enumerable language

12. Explain Language Acceptability and Design of Turing Machine?

13. Write a note on Multitape Machine?

14. Explain Non-Deterministic Turing Machine?

15. Design a Turing machine to accept $L=\{0^n1^m2^n|m, n>=1$

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Academic Year: EVEN/2022- 2023 **F-IAT-06/R0**

SUBJECT: Microcontroller and embedded system **SUB CODE:21CS53**

QUESTION BANK

MODULE 1

---

1. Differentiate microprocessor & microcontroller.

2. Differentiate CISC and RISC architectures.

3. Which are the silent features of ARM instruction set?

4. With a neat diagram explain the ARM based embedded device microcontroller.

5. Explain the structure of ARM cross development kit. OR with a neat diagram explain the different software components of an embedded system.

6. Explain ARM core dataflow model with a neat diagram.

7. Explain the various fields in current program status register (CPSR) with neat diagram.

8. Explain the various modes of operation of ARM processor.

9. Explain the programmer's model of ARM processor with complete register sets available. OR Explain registers used under various modes.

10. With neat diagram explain the various blocks in a 3-stage pipeline of ARM processor organization.

11. Explain briefly pipeline execution characteristics.

12. Explain interrupt, exception and vector table.

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]

13.Explain pipeline and interrupts used in ARM processor.

14. What are the different techniques of core extensions?

15.Discuss the following with neat diagrams

a. Von Neumann architecture with cache

b. Harvard architecture with TCM

16. Briefly explain how coprocessors can be attached to ARM processor.

17. Explain RISC design philosophy.

18. Explain the important design rules of RISC philosophy.

19. Explain ARM design philosophy

20. With a neat diagram explain the different general-purpose registers ARM processors.

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]

MODULE 2 & 3

1. Explain the MOV instruction set provided by ARM7 with the example for each.

2. Brief about the categories of Load Store instructions used with ARM.

3. Explain the ARM Single Register and Multiple Register load store addressing modes with example.

4. Explain Co Processor instructions of ARM Processor.

5. Write a note on Profiling and Cycle Counting.

6. Design ARM assembly language program to perform the addition and multiplication of two 32bit numbers.

7. Explain the scheduling of following instructions with respect to the ARM9TDMI pipeline implementation, i) STR ii) LDRH iii) B Label

8. Define instruction scheduling? Explain the rules summarizing the cycle timings for common instruction classes on the ARM9TDMI.

9. Explain the various looping constraints used in ARM.

10. Explain the following instructions with syntax and examples.

i. MOV

ii. SWI

iii. MSR

iv. TST

11. Discuss the portability issues of Arm core.

12. Explain unaligned data and endianness with an example.

13. Explain division implementation in ARM. What are different types of division routine used to implement division in ARM.

14. Explain scheduling of load instruction.

15. Explain C looping structures.

]

MODULE 4 & 5

1. Explain the fundamental issues in hardware software co-design.
2. Explain the Simulator and Emulator.
3. Explain the concept of 'deadlock' with a neat diagram. Mention the different conditions which favour a deadlock situation.
4. With a neat diagram, explain Operating system architecture.
5. Explain the different communication buses used in automotive application.
6. Write a note on message passing.
7. Explain Multithreading
8. Write a note on types of Operating system.
9. Explain with a neat diagram, the core of an embedded system.
10. What is the difference between embedded and general computing system.
11. Write a note on types of processors or controller used in embedded system.
12. Explain the concept of binary semaphore.
13. Write a short note on censors and actuators.
14. Explain the working of a seven segment LED display.
15. Explain embedded firmware.
16. Write a note on types of processors or controller used in embedded system.
17. Explain the concept of binary semaphore.
18. Write a short note on sensors and actuators.
19. Explain the working of a seven segment LED display.
20. Explain embedded firmware.
21. Write a note on
    a. RESET
    b. Watch dog timer
    c. Brown out protection circuit

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Reference Number: 0004

CERTIFICATE OF COMPLETION

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Instructors **Tim Buchalka, Tim Buchalka's Learn Programming Academy**

jeevan harish

Date **Nov. 18, 2022**
Length **80.5 total hours**

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2-3.1(2)

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ECE_ACTIVITY _REPORT _MARCH (22-23)

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Academic Year: 2022- 2023

*Type of event/activity	Industrial Visit
Name/Title of the Activity/Event	**ISRO UPSC Industrial visit**
Date of Organization	16th March ,2023
Venue (with address)	OLD airport road ,Bangalore
Organized by	Department of Electronics and Communication Engineering.
Objectives of the event/activity	The objective of the visit was to provide a Technical Exposure to the students about Space Technology and advancements in Technology
Participants	3rd Semester E C E students
Mention organized /participated/attended	Prof. Ravishankar M.N, Prof. Agalya P

Event Description:

A one day Industrial visit to **Indian space Research Organization (ISRO),** Bangalore was organized by the Department of Electronics and Communication Engineering on 16th March 2023 with the lead role taken up by our beloved Head of the department **Dr. Sateesh Kumar** to organizing the visit. It was a half day visit comprising of 55 students from 3rd semester along with faculties **Prof. Ravishankar M.N,and Prof. Agalya P**. The objective of the visit was to provide a Technical Exposure to the students aboutSpace Technology and advancements in Technology. The visit not only provided a good insight into the quality of research happening in the area of space technology but also gave great exposure to the students about the future career prospects and areas of research in applied sciences.The Industrial Visit was a great benefit for the students to directly understand about the various concepts of satellite and space missions doneby ISRO.

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Images:

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ISRO is among the largest government space agencies in the world. Its primary objective is to "harness space technology for national development, while pursuing space science research and planetary exploration."ISRO Satellite Centre (ISAC) is the lead center of the Indian Space Research Organization (ISRO) responsible for design, development, assembly & integration of communication, navigation, remote sensing, scientific and small satellite missions.

For the benefit of students there is a space exhibition center at ISAC. We were able to see the exhibition. The exhibition included the models of the first Indian satellite Aryabhatta, APPLE, INSAT series etc. Satellites are basically of two types- Indian Remote Sensing (IRS) satellites and communication satellites.IRS-1A was the first remote sensing mission undertaken by the Indian Space Research Organization (ISRO).

OUTCOME OF THE VISIT:

- It provide a Technical Exposure to the students about Space Technology and advancements in Technology.
- The visit not only provided a good insight into the quality of research happening in the area of space technology but also gave great exposure to the students about the future career prospects and areas of research in applied sciences.
- The Industrial Visit was a great benefit for the students to directly understand about the various concepts of satellite and space missions done by ISRO.

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Note:

(i)At the end map PO's (with 3/2/1):

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
2	3	3	2	-	3	2	-			1	1

***Type of activity:**

Industrial Visit

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Coordinators:

Prof .Prathibha P
Prof. Vinutha C.M

Signature of the HOD

[Dr.H.C Sateesh Kumar]

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Department of Electronics and Communication Engineering

Academic Year: 2022- 2023

Report of TALK on "Cracking a top – 100 AIR at the GATE "

- The Department of Electronics & Communication Engineering in association with STUTI committee organized seminar on "**Cracking a top – 100 AIR at the GATE**" on 8th November, 2022 for students across various disciplinary of engineering. The students attended the talk. The talk was successfully organized and carried out by the Electronics & Communication Engineering department.
- **Objective of the Seminar**: The seminar gave the students information about the importance of GATE exams for higher education and also the benefits of career opportunities. This talk was given by the speaker **Mr. Prateek Mishra** provided information on how to prepare for the GATE exams. This seminar is very useful for students to clear the GATE exams.
- The speaker provided information on benefits and career opportunities of GATE exams.
- Overall the students felt that the session was informative & gain knowledge .

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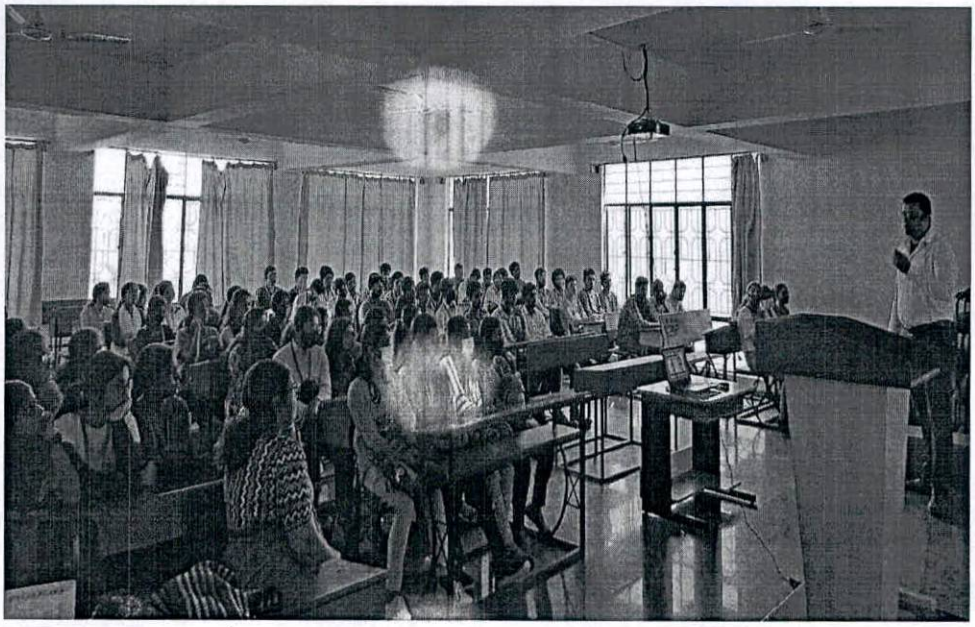
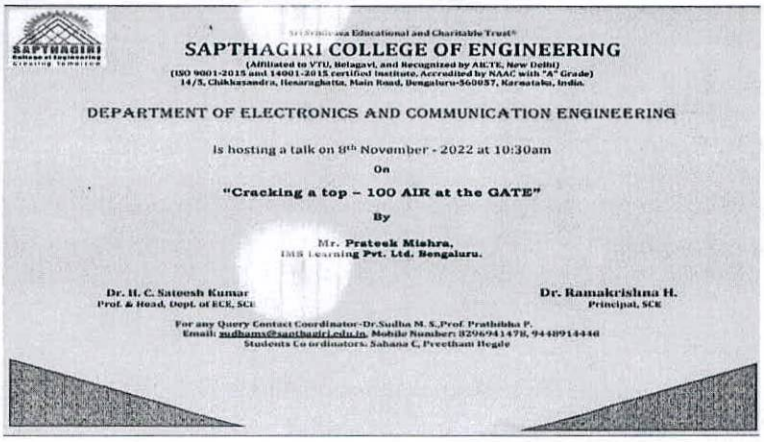


Live Session on GATE Exam Preparation by Mr.Prateek Mishra

Seminar Brochure



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Reportontalk

Withthevisionofhelpingstudentswiththebestinclass-education,DepartmentofElectronicsandCommunicationofSapthagiriCollegeofEngineeringhosted atalkon21/4/2023on **"Career guidance on Technical Profile Building and higher education"**

The session began with the introduction of speaker by student, Swathi.P. Mr MARK BRANDON VERNUM, Bengaluruwas thespeaker of the session. The objective of this talk was to improve students skills and practical knowledge by giving examples,also said about for apportuinity for internship with stipend around Rs10,000 to 30,000 and also to work on real time project,where practical knowledge will be gained helps to improve placements.

Speaker Profile

Name : MARK BRANDON VERNUM

BTL Head - Imarticus Learning

Strategic Partnerships Head – BYJUs

Communications and Operations Specialist - JCPenney

PR Advisor and Consultant - Kadence India

National Awardee Musician, Social Worker Academic Researcher

Voice over artist/MC for several documentaries/events and winner of several theatre accolades ,7+ years experience in sales and mentoring for Trinity College of London Academics

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Speaker giving theseminar

Students attending theseminar

At the end of the session, he also answered the questions put up by students. The session ended with group discussion with students, ECE, SCE, Bangalore. Overall,it benefitted around115 students of 6th semester Electronics and Communication Engineering.

Co-ordinators

Prof.PrathibhaP.

ProfVinutha

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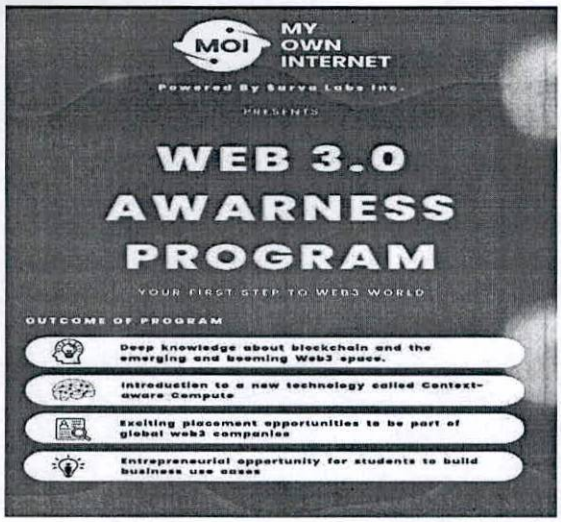
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Report on Technical Seminar

With the vision of helping students with the best in class-education, Department of **Electronics and Communication** of Sapthagiri **College of Engineering** hosted a Technical SEMINAR on 23/11/2022 and 24/11/2022 on "**WEB 3.0 AWARNESS PROGRAM".**

Mr. Omkar Kushal N K (Founder, CEO @ Platon Services PVT LTD) and Geetika Gahlot (WEB 3 Marketing & Community) were the speakers of the session. The objective of this seminar was to throw light on the new innovations in the field of WEB 3.0.

The session began with welcome address and the introduction of speaker by Harshan Gowda K H, student,7th sem ECE, SCE, Bangalore. The speaker gave a brief insight about the field of WEB 3.0 and how it can be related to electronic engineering to make various inventions.



Brochure

Addressing the students

Initially, speaker gave the information of WEB 1.0, WEB 2.0 and MOI (My own internet). It is MOI, the primary offering of Sarva Labs, is a decentralized global web3 network that supports humanized interactions on the internet enabling true P2P value transfers and personalized digital

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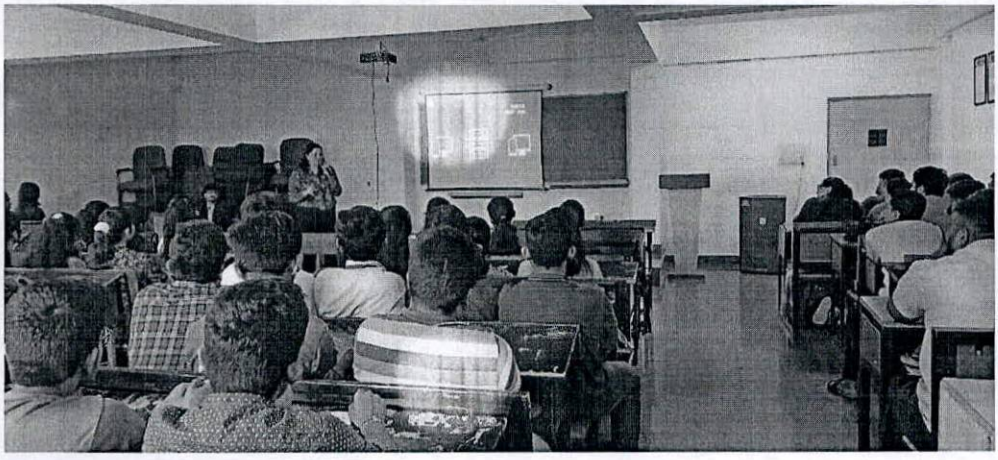
interactions. MOI is built using the Interaction State Machine (ISM), a revolutionary new computational model created by Sarva Labs specifically for the web3 world. Using the ISM technology, MOI delivers a simple, secure and sustainable web3 experience for users by enabling a single web3 network capable of hosting millions of nodes to support billions of transactions with complete user privacy, ownership and control. With a practical and equitable governance model, the value generation is democratic, while offering flexibility to support the social and regulatory norms of respective environments.

At the end of the session, he also answered the questions put up by students. The session ended with vote of thanks. Overall, it benefitted around 300+ students of 3rd, 5th,7th semester Electronics and Communication Engineering students.



Speaker answering the questions put up by the students

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Co-ordinators

Prof. Agalya P.

Prof. Prathibha P.

HOD

Head of the Department
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Department/Branch	EEE– Chemistry Group	Semester : II	Section: A
Academic Year	2022-23	Room No.	CLH-104
Class Teacher	Dr. K P Roopa		

Proctor's Name: Dr. K P Roopa Mobile No: 9742821360 e-mail: roopakp @sapthagiri.edu.in	Proctor's Name: Sumitra Devi M R Mobile No: 9972736668 e-mail: sumitradevimr @sapthagiri.edu.in	Proctor's Name: Sushma P M Mobile No: 9164187486 e-mail:sushmapm @sapthagiri.edu.in

PERIOD	1	2	BREAK	3	4	BREAK	5	6	7
TIME	8:30am – 9:30am	9:30am – 10:30am	10:30 am - 10:50 am	10:50am - 11:50am	11:50am - 12:50pm	12:50pm - 1:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
DAY									
MON	BESCK204C	BPWKS206		BCHEE202	BMATE201	Lunch Break	-------BCED203(A1)-----		
TUE	BMATE201	BICOK207		BCHEE202	BPLCK205B		----- BCHEE202 (A1)/ BMATE201 (A2)/ BPLCK205B (A3)---		
WED	----- BCHEE202 (A2)/ BMATE201 (A3)/ BPLCK205B (A1)-----			*BESCK204C	BCHEE202		*BMATE201		
THU	BPLCK205B	*BCHEE202		BCED203	BCED203		------ BCED203(A2)-------		
FRI	----- BCHEE202 (A3)/ BMATE201 (A1)/ BPLCK205B (A2)---			BESCK204C	BSFHK258		Mini Project activity		
SAT	BMATE201	*BPLCK205B		------ BCED203(A3)-------					

*Indicates-Tutorial Class

Subject Allocation

Course and Course Code		Course Title	Faculty Name	Faculty Code
*ASC(IC)	BMATE201	Mathematics for EES-II Theory & Lab	Sumitra Devi M R	SMR
#ASC(IC)	BCHEE202	Chemistry for EES Theory & Lab	Dr. K P Roopa	Dr. KPR
ESC	BCED203	Computer-Aided Engineering Drawing Theory & Lab	Anil Kumar PR	APR
ESC-II	BESCK204C	Introduction to Electronics Engineering	Rupashree M	RM
PLC-II	BPLCK205B	Introduction to Python Programming	Ashwini C	ASC
AEC	BPWKS206	Professional writing skills in English	Pallavi T S	PTS
HSMC	BICOK207	Indian Constitution	Nagesha V N	NVN
HSMS	BSFHK258	Scientific foundations of Health	Malashree G	MG

Time Table Coordinator

Dr. R Harish
M. Sc., M. Tech., Ph. D
Professor and Head
Department of Physics
Sapthagiri College of Engineering
Bengaluru-560 057

Principal

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Sapthagiri College of Engineering, Bengaluru.
Department of Electrical and Electronics Engineering

ODD SEMESTER TIME TABLE with effect from 31-10-2022									Rev: 00
Branch	EEE			Semester : III					Section : B
Academic Year	2022-2023			Room No.: -------					
Class Teacher	Mrs. PREETHA N P								
Proctor : Dr. Raghavendra G Mob : 9880070817 Email :raghavendrag@sapthagiri.edu.in				Proctor : Mrs. Supriya Sajjan Mob : 9620721848 Email : supriyasajjan@sapthagiri.edu.in					
PERIOD →	1	2	--	3	4	---	5	6	7
TIME → DAY	8:30 am – 9:30 am	9:30 am – 10:30 am	10:30 - 10:50	10:50 am - 11:50 am	11:50 am - 12:50 pm	12:50 - 01:45	01:45 pm - 02: 40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
MON	21MAT31 (406)	21EE33 (406)	SHORT	21EE32 (406)	21EE34 (406)	LUNCH BREAK	FORUM ACTIVITY		
TUE	21EE33 (405)	21EE32 (405)		21MAT31 (405)	SKILL DEVELOPMENT		21UH36		FORUM ACTIVITY
WED	21EE32 (407)	21EE33 (407)		21MAT31 (407)	21EE34 (408)		21EEL35(B1)/21EEL381(B2)		
THU	21EE34 (408)	21EE32 (408)		21EE32(B1)/21EE33(B2)			21MAT31 (405)	21KSK37 (405)	21KBK37(405)
FRI	21EEL35(B2)/21EEL381(B1)				21EE34 (406)		21EE33 (408)	21EE32 (408)	21MATDIP31
SAT	21EE32(B2)/21EE33(B1)				21MATDIP31				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
21MAT31	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	Mr. SANTHOSH H C	SHC
21EE32	ANALOG ELECTRONICS CIRCUITS AND OP-AMPS	Dr. VIDYA M	VM
21EE33	ELECTRIC CIRCUIT ANALYSIS	Mrs. PREETHA N P	PNP
21EE34	TRANSFORMERS AND GENERATORS	Mrs. SUPRIYA S	SS
21EEL35	ELECTRICAL MACHINES LABORATORY -I	Mrs. ASHWINI C	AC
21UH36	SOCIAL CONNECT AND RESPONSIBILITY	Mrs. ASHWINI C	AC
21KSK37	SAMSKRUTIKA KANNADA	Mrs. LAKSHMI S	LS
21KBK37	BALAKE KANNADA	Mrs. LAKSHMI S	LS
21EEL381	SCI LAB FOR TRANSFORMERS AND GENERATORS	Mrs. MALASHREE G	MG
21MATDIP31	ADDITIONAL MATHEMATICS - I	------	-----

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Sapthagiri College of Engineering, Bengaluru.
Department of Electrical and Electronics Engineering

ODD SEMESTER TIME TABLE with effect from 31-10-2022			Rev: 00
Branch	EEE	Semester : III	Section : A
Academic Year	2022-2023	Room No.: ALH- 408	
Class Teacher	Dr. VIDYA M		

Proctor : Dr. Vidya M
Mob : 9972311289
Email :vidyam@sapthagiri.edu.in

Proctor : Mr. Gopinath K
Mob : 9036076909
Email :gopinath.eee@sapthagiri.edu.in

PERIOD →	1	2	--	3	4	---	5	6	7
TIME →	8:30 am	9:30 am	10:30	10:50 am	11:50 am	12:50	01:45 pm	02:40 pm	03:35 pm
DAY	- 9:30 am	- 10:30 am	- 10:50	- 11:50 am	- 12:50 pm	- 01:45	- 02: 40 pm	- 03:35 pm	- 04:30 pm
MON	21EE32	21EE34	SHORT BREAK	21MAT31	SKILL DEVELOP MENT	LUNCH BREAK	21EEL35(A1)/21EEL381(A2)		
TUE	21EE34	21EE33		21EE32	-		FORUM ACTIVITY		
WED	21MAT31	21EE33		21EE32	SKILL DEVELOP MENT		21EE32(A1)/ 21EE33(A2)		-
THU	21EEL35(A2)/21EEL381(A1)				21MAT31		21KSK37	21EE34	21KBK37
FRI	21EE33	21EE34		21EE32(A2)/ 21EE33(A1)			21UH36		21MATDIP31
SAT	21EE34	21EE32		21MAT31	21MATDIP 31				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
21MAT31	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	Mr. SANTHOSH H C	SHC
21EE32	ANALOG ELECTRONICS CIRCUITS AND OP-AMPS	Dr. VIDYA M	VM
21EE33	ELECTRIC CIRCUIT ANALYSIS	Mr. GOPINATH K	GK
21EE34	TRANSFORMERS AND GENERATORS	Mrs. SUPRIYA S	SS
21EEL35	ELECTRICAL MACHINES LABORATORY -1	Mrs. SUPRIYA S	SS
21UH36	SOCIAL CONNECT AND RESPONSIBILITY	Mrs. ASHWINI C	AC
21KSK37	SAMSKRUTIKA KANNADA	Mrs. LAKSHMI S	LS
21KBK37	BALAKE KANNADA	Mrs. LAKSHMI S	LS
21EEL381	SCI LAB FOR TRANSFORMERS AND GENERATORS	Mrs. MALASHREE G	MG
21MATDIP31	ADDITIONAL MATHEMATICS - I	------	-------

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Department of Electrical and Electronics Engineering

EVEN SEMESTER TIME TABLE with effect from 27-07-2023			Rev: 02
Branch	EEE	Semester : IV	Section : A
Academic Year	2022-2023	Room No: ALH-407	
Class Teacher	Mrs. Ashwini C		

Proctor : Dr Vidya M Mob : 9972311289 Email :vidyam@sapthagiri.edu.in	Proctor : Mr. Gopinath K Mob : 9036076909 Email: gopinath.eee@sapthagiri.edu.in	Proctor : Mrs. Preetha N P Mob : 9620782356 Email : preethanp@sapthagiri.edu.in

PERIOD →	1	2	--	3	4	---	5	6	7
TIME → DAY	8:30 am - 9:30 am	9:30 am - 10:30 am	10:30 - 10:50	10:50 am - 11:50 am	11:50 am - 12:50 pm	12:50 - 01:45	01:45 pm - 02: 40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
MON	21EE42(A1)/ 21EE43(A2)/ 21EE46(A3)				21MAT41	LUNCH BREAK	21EE43	21EE44	21EE42
TUE	21EE44	21UH49	SHORT BREAK	21EE43	21EE42		21EE42(A2)/21EE43(A3)/ 21EE46(A1)		
WED	21MAT41	21EE45		21EE42	21EE44		21EEP481/Placement training		
THU	21EE43	21EE42		21EE44	21CIP47		21EE42(A3)/21EE43(A1)/ 21EE46(A2)		
FRI	21EE42	21MAT41		21EE43	21EE44		21MATDIP41		Forum Activity
SAT	21EE45	21UH49		21MAT41	21EE43				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
21MAT41	Complex analysis, probability and statistical methods	Mr. Santhosh H C	SHC
21EE42	Digital System Design	Mrs. Malashree G / Mrs. Reshma & Mr. A Dhamodaran (Lab)	MG / RS / AD
21EE43	Microcontroller	Mrs. Supriya Sajjan / Dr. Ragavendra G	SS / GR
21EE44	Electric Motors	Mrs. Ashwini C	AC
21EE45	Biology for Engineers	Mrs. Reshma	RS
21EE46	Electrical Machines Laboratory -2	Mrs. Supriya Sajjan / Mr. Gopinath K	SS/GK
21CIP47	Constitution of India, Professional Ethics and Cyber Law	Mr. Nagesha V N	NVN
21EEP481	Microcontroller Based Projects	Dr. Vidya M	VM
21MATDIP41	Additional Mathematics - II	-----	----
21UH49	Universal human values	Dr. Raghavendra G	GR

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EVEN SEMESTER TIME TABLE with effect from 07-07-2023			Rev: 01
Branch	EEE	Semester : IV	Section : B
Academic Year	2022-2023	Room No.: ALH-405	
Class Teacher	Dr. Vidya M		

Proctor : Mrs Supriya sajjan Mob : 9620721848 Email:supriyasajjan@sapthagiri.edu.in	Proctor : Mrs.Reshma Mob : 7619348561 Email :reshma@sapthagiri.edu.in	Proctor : Mrs. Preetha N P Mob : 9620782356 Email : preethanp@sapthagiri.edu.in

PERIOD →	1	2	--	3	4	---	5	6	7
TIME → DAY	8:30 am - 9:30 am	9:30 am - 10:30 am	10:30 - 10:50	10:50 am - 11:50 am	11:50 am - 12:50 pm	12:50 - 01:45	01:45 pm - 02: 40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
MON	21EE43	21EE42	SHORT BREAK	21EE44	21UH49	LUNCH BREAK	21EE42(B1)/21EE43(B2)/ 21EE46(B3)		
TUE	21MAT41	21EE42		21EE45	21EE43		21EE44	21EEP481/Placement training	
WED	21UH49	21EE44		21MAT41	21EE43		21EE42(B2)/21EE43(B3)/ 21EE46(B1)		
THU	21EE45	21EE43		21EE44	21EE42		21CIP47	21MAT41	21EEP481/ Placement training
FRI	21EE42(B3)/21EE43(B1)/ 21EE46(B2)				21MAT41		21MATDIP41		Forum Activity
SAT	21EE42	21EE44		21EE43	21EE42				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
21MAT41	Complex analysis, probability and statistical methods	Mr. Santhosh H C	SHC
21EE42	Digital System Design	Mrs. Malashree G / Mr.Gopinath K	MG / GK
21EE43	Microcontroller	Mrs. Ramya M	RM
21EE44	Electric Motors	Dr. Rekha S N	SNR
21EE45	Biology for Engineers	Mrs. Reshma	RS
21EE46	Electrical Machines Laboratory -2	Mrs. Ashwini A V/ Dr Rekha S N / Mr.Gopinath K	AAV/SNR/GK
21CIP47	Constitution of India, Professional Ethics and Cyber Law	Mr. Nagesha V N	NVN
21EEP481	Microcontroller Based Projects	Dr. Vidya M	VM
21MATDIP41	Additional Mathematics - II	----	---
21UH49	Universal human values	Dr. Raghavendra G	GR

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EVEN SEMESTER TIME TABLE with effect from 20-03-2023			Rev: 00
Branch:	EEE	Semester : VI	Section : A
Academic Year:	2022-2023	Room No.: ALH–405	
Class Teacher:	Mrs. Ramya M		

Proctor : Mr. A Dhamodaran
Mob : 9620540352
Email :adhamodaran@sapthagiri.edu.in

Proctor : Mrs. Swetha G
Mob : 9480710245
Email : swethag@sapthagiri.edu.in

PERIOD →	1	2	-	3	4	---	5	6	7
TIME →	8:30 am	9:30 am	10:30	10:50 am	11:50 am	12:50	01:45 pm	02:40 pm	03:35 pm
DAY	– 9:30 am	– 10:30 am	- 10:50	- 11:50 am	- 12:50 pm	- 01:45	- 02: 40 pm	- 03:35 pm	- 04:30 pm
MON	18EE62	18EE63	SHORT BREAK	18EE65X	18EE61	LUNCH BREAK	18EEL66(B1)/18EEL67(B2)/ 18EEMP68 & placement training (B3)		
TUE	18EE65X	18EE61		18EE63	18EE643/ 18EE647		18EE643(CAED LAB))(A1)		
WED	18EE63	18EE61		18EE65X	18EE62		18EEL66(B2)/18EEL67(B3)/ 18EEMP68 & placement training (B1)		
THU	18EE65X	18EE63		18EE643/ 18EE647	18EE62		18EE643(CAED LAB))(A2)		
FRI	18EE643/ 18EE647	18EE62		18EE61	18EE63		18EEL66(B3)/18EEL67(B1)/ 18EEMP68 & placement training (B2)		
SAT	18EE61	18EE62		18EE643/ 18EE647	18EEMP68				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18EE61	CONTROL SYSTEMS	Mrs. Ramya M	RM
18EE62	POWER SYSTEM ANALYSIS–I	Mrs. Reshma	RS
18EE63	DIGITAL SIGNAL PROCESSING	Mrs. Preetha N P	PNP
18EE643	COMPUTER AIDED ELECTRICAL DRAWING	Mrs. Swetha G	GS
18EE643	CAED LAB	Mrs. Swetha G	GS
18EE647	SENSORS AND TRANSDUCERS	Mrs. Ashwini A V	AVV
18EE65X	OPEN ELECTIVE-A	----------	------
18EEL66	CONTROL SYSTEM LAB	Mr. A Dhamodaran	AD
18EEL67	DIGITAL SIGNAL PROCESSING LAB	Mrs. Preetha N P	PNP
18EEMP68	MINI-PROJECT	Dr. Vidya M	VM

** Note – 3 days Placement Training

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EVEN SEMESTER TIME TABLE with effect from 13/02/2023			Rev: 00
Branch:	EEE	Semester : VIII	Section : B
Academic Year:	2022-2023	Room No.: ALH-408	
Class Teacher:	Mr. Dhamodaran A		

Proctor : Mrs. Ashwini C Mob : 9620960502 Email: ashwinic@sapthagiri.edu.in	Proctor : Mrs. Ramya M Mob : 9035344998 Email : ramyam@sapthagiri.edu.in	Proctor : Mrs. Preetha N P Mob. : 9620782356 Email : preethanp@sapthagiri.edu.in

PERIOD →	1	2	--	3	4	---	5	6	7
TIME → DAY	8:30 am – 9:30 am	9:30 am – 10:30 am	10:30 - 10:50	10:50 am - 11:50 am	11:50 am - 12:50 pm	12:50 - 01:45	01:45 pm - 02: 40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
MON	18EEI85 - INTERNSHIP		SHORT BREAK	18EEI85 - INTERNSHIP		LUNCH BREAK	18EEP83 - PROJECT WORK		
TUE	18EEI85 - INTERNSHIP			18EEI85 - INTERNSHIP			18EEP83 - PROJECT WORK		
WED	18EES84 – TECHNICAL SEMINAR			18EES84 – TECHNICAL SEMINAR			18EEP83 - PROJECT WORK		
THU	18EES84 – TECHNICAL SEMINAR			18EES84 – TECHNICAL SEMINAR			18EEP83 - PROJECT WORK		
FRI	18EE81	18EE81		18EE822/ 18EE824	18EE822/ 18EE824		18EEP83 - PROJECT WORK		
SAT	18EE822/ 18EE824	18EE822/ 18EE824		18EE81	18EE81				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18EE81	POWER SYSTEM OPERATION AND CONTROL	Mr. Dhamodaran A	AD
18EE822	ELECTRICAL ESTIMATING AND COSTING	Dr. Vijay Kumar Kulkarni	VK
18EE824	POWER SYSTEM PLANNING	Dr. Vidya M	VM
18EEP83	PROJECT WORK PHASE-2	Dr. Vidya M / Mrs. Ramya M	VM / RM
18EES84	TECHNICAL SEMINAR	Dr. G Raghavendra / Mrs. Malashree G	GR / MG
18EEI85	INTERNSHIP	Mr. Dhamodaran A / Mrs. Preetha N P	AD / PNP

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Department of Electrical and Electronics Engineering

EVEN SEMESTER TIME TABLE with effect from **13/02/2023**			Rev: **00**
Branch:	**EEE**	Semester : **VIII**	Section : **A**
Academic Year:	**2022-2023**	Room No.: **ALH-407**	
Class Teacher:	**Dr. Vidya M**		

Proctor : Mrs. Malashree G Mob. : 9901782371 Email : malashreeg@sapthagiri.edu.in	Proctor : Mrs. Ashwini A V Mob. : 8971855119 Email : ashwiniav@sapthagiri.edu.in	Proctor : Mrs. Preetha N P Mob. : 9620782356 Email : preethanp@sapthagiri.edu.in

PERIOD →	1	2	--	3	4	---	5	6	7
TIME →	8:30 am	9:30 am	10:30	10:50 am	11:50 am	12:50	01:45 pm	02:40 pm	03:35 pm
DAY	– 9:30 am	– 10:30 am	- 10:50	- 11:50 am	- 12:50 pm	- 01:45	- 02: 40 pm	- 03:35 pm	- 04:30 pm
MON	18EEI85 - INTERNSHIP		SHORT BREAK	18EEI85 - INTERNSHIP		LUNCH BREAK	18EEP83 - PROJECT WORK		
TUE	18EEI85 - INTERNSHIP			18EEI85 - INTERNSHIP			18EEP83 - PROJECT WORK		
WED	18EES84 – TECHNICAL SEMINAR			18EES84 – TECHNICAL SEMINAR			18EEP83 - PROJECT WORK		
THU	18EES84 – TECHNICAL SEMINAR			18EES84 – TECHNICAL SEMINAR			18EEP83 - PROJECT WORK		
FRI	18EE81	18EE81		18EE822/ 18EE824	18EE822/ 18EE824		18EEP83 - PROJECT WORK		
SAT	18EE822/ 18EE824	18EE822/ 18EE824		18EE81	18EE81				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18EE81	POWER SYSTEM OPERATION AND CONTROL	Mrs. Preetha N P	PNP
18EE822	ELECTRICAL ESTIMATING AND COSTING	Dr. Vijay Kumar Kulkarni	VK
18EE824	POWER SYSTEM PLANNING	Dr. Vidya M	VM
18EEP83	PROJECT WORK PHASE-2	Dr. Vidya M / Mrs. Ramya M	VM / RM
18EES84	TECHNICAL SEMINAR	Dr. G Raghavendra / Mrs. Malashree G	GR / MG
18EEI85	INTERNSHIP	Mr. Dhamodaran A / Mrs. Preetha N P	AD / PNP

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MODULE-1

Chemistry of Electronic Materials

1) What are conductors and insulators? Explain the principle involved in conductors and insulators by taking an examples. (6 marks)

2) Mention the differences between conductors, semiconductors and insulators band theory? 6marks

3) What are semiconductors? Explain the production of electronic grade silicon by Czochralski (CZ) process. (7 marks)

4) Explain the production of electronic grade silicon by Float Zone (FZ) method. (7marks)

5) What are conducting polymers? Explain the synthesis and conducting mechanism of polyacetylene. Mention its commercial applications. (7marks)

6) Explain the preparation, properties and commercial applications of graphene oxide (Hammer method)? (7 marks)

7) Define electroless plating. Describe the electroless plating of copper in the manufacture of double-sided PCB? (6 marks)

8. **Numerical problems on Number average and Weight average molecular weight of polymers.** (Refer class notes and Text book) (7 Marks)

MODULE-2

Energy Conversion and Storage

1. Define batteries. Explain the construction, working and applications of Na - ion battery. (7 marks)

2. Explain classification battery (6 Marks)

2) Explain the components in the battery? (6 marks)

3) Describe construction, working and applications of Li-polymer solid state battery. (7marks)

4) Explain construction, working and applications of Vanadium redox flow battery. (7 marks)

5) Define fuel cells. Explain the construction, working and applications of Methanol-oxygen fuel cell?

6) Explain the construction, working and applications of polymer electrolyte membrane (PEM) fuel cell.

7) What are photovoltaic cells? Explain the construction and working of solar photovoltaic cell.

8) Mention advantages and disadvantages of PV Cell. (6 Marks)

MODULE-3

Corrosion Science and E-waste Management

1. What is corrosion? Explain the electrochemical theory of corrosion taking iron as example.(7Marks)
2. Explain the Galvanizing process with a neat diagram.(6Marks)
3. What is Cathodic protection? Explain sacrificial anodic method. (6Marks)
4. Explain i) Differential metal corrosion ii) Waterline Corrosion ii) Pitting Corrosion. (6Marks)
5. Numerical problems on CPR .(7Marks) (Refer class notes and Text book)
6. What is E-waste? Discuss the sources, Types and effects of E-waste on Environment and Human Health. (7Marks)
7. Explain the Methods of E-waste disposal .(7Marks)
8. Explain the Extraction of Gold from E-waste. .(6Marks)
9. Explain the Extraction of Copper from E-waste. Mention the any 2 advantages of recycling. .(7Marks)

MODULE-4

Nanomaterials and Display Systems

1. What are nanomaterials? Explain the size dependent properties of nanomaterials (8 Marks)
2. Describe the synthesis of nanomaterials by Solo-gel method. (7 Marks)
3. What are Liquid crystals? Explain the classification, properties and application of liquid crystals in display systems. (7 Marks)
4. Mention the Properties and applications of nanofibers, nanophotonics and nano sensors (8 Marks)
5. Mention the Properties and applications of : OLED and QLED (6 Marks)
6. What are Perovskite materials? Mention the Properties and applications of Perovskite materials. (7Marks)
7. Describe the synthesis of nanomaterials by Co- precipitation method (6 Marks)

MODULE-5

Sensors in Analytical Techniques

1. What is reference electrode? Describe the construction & working of Calomel electrode (7 Marks)
2. What are Concentration cells? Explain the construction & working of electrolyte concentration cell with a suitable example. (7 Marks)
3. What are ion selective electrodes? Describe the construction & working of Glass electrode. (7 Marks)
4. Explain the determination of pH using glass electrode (6 Marks)
5. **Problems on Concentration cell** (6 Marks) (Refer class notes and Text book)
6. What are optical sensors? Explain the Principle and Instrumentation of Colorimetric sensors. (7Marks)
7. What are Potentiometric sensors? Explain the working Principle, Instrumentation and Applications of Potentiometric sensors (Estimation of Iron) (7Marks)
8. What are Conductometric sensors? Explain the working Principle, Instrumentation and Applications of Conductometric sensors (Estimation of Weak acid) (7Marks)
9. What are Electrochemical sensors? Explain the working Principle and Applications of Electrochemical sensors (6Marks)

**********ALL THE BEST**********

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Department of Electrical & Electronics Engineering

Question Bank-I

Subject: MICROCONTROLLER Sub Code: 21EE43
Semester/Section: IV

Q.N	QUESTIONS	Marks	CO'S
1.	Comparison between microprocessor and microcontroller.	6	CO1
2.	Comparison between RISC and CISC.	6	CO1
3.	Comparison between Von-neuman and Harvard architecture.	6	CO1
4.	Explain criteria for choosing a microcontroller.	5	CO1
5.	List out applications of 8051 microcontroller.	5	CO1
6.	Explain microcontroller survey.	5	CO1
7.	Explain the pin diagram of 8051 with its functions.	6	CO1
8.	Explain salient features of 8051 microcontroller.	6	CO1
9.	Explain 1.Accumulator 2. B register 3. DPTR 4. Program counter 5.Timers/counters 6. Oscillator	6	CO1
10.	Explain with a neat block diagram the architecture of 8051 microcontroller.	6	CO1
11.	Explain the concept of flags and 8 bits of PSW register.	6	CO1
12.	Explain special function registers(SFR).	5	CO1
13.	Explain the operation of stack with PUSH and POP instructions. Also give examples.	6	CO1

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Bengaluru - 560057

14.	Discuss RAM and ROM memory structure of 8051 microcontroller with neat diagram.	8	CO1
15.	Explain the various addressing modes of 8051 microcontroller with examples.	5	CO1

Blooms Taxonomy: L1-Remembering, L2-Understand, L3-Apply, L4- Analyzing, L5-Evaluating, L6- Creating.

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Sri Srinivasa Educational & Charitable Trust

SAPTHAGIRI COLLEGE OF ENGINEERING

(Affiliated to VTU, Belagavi, and Recognized by AICTE, New Delhi)
(IAO9001-2015 and ISO14001-2015 certified institute)
14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560057

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
Assignment -II

Subject: MICROCONTROLLER Sub Code: 21EE43
Semester/Section: IV

Q.N	QUESTIONS	CO'S
1.	Define assembler directives. With example explain all the assembler directives supported by 8051 microcontroller.	CO2
2.	Write assembly language program to multiply 25 by 10 using repeated addition.	CO2
3.	Write 8051 program to generate square wave with tON = 3ms and tOFF = 7ms on all pins of Port 0. System Clock is 22MHz. Use timer0 in Mode-1..	CO3
4.	Analyze different data types supported by 8051C Microcontroller.	CO3
5.	Assume that a 1-Hz external clock is being fed into pin T1(P3.5). Write a C programming for counter 1 in mode-2(8-bit auto reload) to count up and display the state of the TL1 count on P1. Start the count at 00H.	CO3
6.	Write a 8051 C program to toggle all the bits of P2 continuously 500ms. Use Timer 1, 16-bit mode to generate the delay. f=11.0592Hz	CO3
7.	Compare polling and interrupts. What are the steps a microcontroller performs upon activation of Interrupt	CO4
8.	Write a C program for the 8051 to transfer "VTU Belagavi" serially at 9600 baud, 8-bit data, 1 stop bit, do this continuously..	CO4
9.	Explain the importance of TI and RI flags.	CO4
10.	Explain RS-232 hand shaking signals and specify the purpose of MAX – 232 while interfacing	CO4
11.	Write a program that continuously gets 8-bit data from 'P0' and sends it to 'P1' where simultaneously creating a square wave of 200µs period on pin P2.0. Use timer-0 to create square wave. Assume XTAL=11.0592.	CO4
12.	Explain how interrupt priority can be changed using IP register. Also explain the default priorities assigned to interrupts in 8051 microcontroller..	CO4

Blooms Taxonomy: L1-Remembering, L2-Understand, L3-Apply, L4- Analyzing, L5-Evaluating, L6-Creating.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Assignment -I

Subject: MICROCONTROLLER Sub Code: 21EE43
Semester/Section: IV

Q.N	QUESTIONS	Marks	CO'S
1.	Comparison between microprocessor and microcontroller.	6	CO1
2.	Comparison between RISC and CISC.	6	CO1
3.	Comparison between Von-neuman and Harvard architecture.	6	CO1
4.	Explain criteria for choosing a microcontroller.	5	CO1
5.	Explain the pin diagram of 8051 with its functions.	6	CO1
6.	Explain salient features of 8051 microcontroller.	6	CO1
7.	Explain with a neat block diagram the architecture of 8051 microcontroller.	6	CO1
8.	Explain the concept of flags and 8 bits of PSW register.	6	CO1
9.	Explain special function registers(SFR).	5	CO1
10.	Explain the operation of stack with PUSH and POP instructions. Also give examples.	6	CO1
11.	Discuss RAM and ROM memory structure of 8051 microcontroller with neat diagram.	8	CO1
12.	Explain the various addressing modes of 8051 microcontroller with examples.	5	CO1

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Module 1

Q. NO.	Questions	CO	RBT	MARKS
1.	Explain & derive the frequency domain sampling and reconstruction of discrete time signals.	01	L3	1,2
2.	Obtain the 4-point DFT of the sequence **x(n)= (1, 2, 3, 4).** Draw the magnitude and phase spectrum.	01	L3	1,2
3.	Find the IDFT of **X(K) = {1, -j/3, 1/3, j/3 }**	01	L3	1,2
4.	Obtain the 4-point **DFT** of the sequence x(n)= (1/3, 1/3, 1/3, 1/3). Draw the magnitude and phase spectrum.	01	L3	1,2
5.	Find the 8 point DFT of x (n) = { 1, 1 ,1 ,1, 1, 1, 1, 1 }, also draw the phase spectrum & magnitude spectrum	01	L3	1,2
6.	Prove the Frequency Shift Property & Time shift Property of the DFT	01	L3	1,2
7.	Compute 8-poin DFT of the sequence x(n)= {1,1,1,1,1,1,0,0}	01	L3	1,2
8.	Find the 4-point circular convolution of the sequences, $x_1(n) = (1, 2, 3, 4)$ and $x_2(n) = (4, 3, 2, 2)$ using Time-domain approach and verify the result using frequency domain approach.	01	L3	1,2
9.	Show & prove that the multiplication of two DFTs leads to circular convolution of respective time sequences	01	L3	1,2
10.	Find the N point DFT of $x(n) = \cos(2\pi K_0 n)/N$, $0 \leq K \leq N-1$	01	L3	1,2

Module 2

11.	Explain the procedure for long sequence filtering using overlap add method with suitable example	02	L3	1,2
12.	Explain the procedure for long sequence filtering using overlap save method with suitable example	02	L3	1,2
13.	Prove that the twiddle factor/phase factor is periodic.	02	L3	1,2
14.	Consider a filter with impulse response h[n] = {3,2,1,1}, if the input is x[n] = {1,2,3,3,2,1,-1,-2,-3,5,6,-1,2,0,2,1}. Find the output y[n] using overlap add method assuming the length of the block is 7.	02	L3	1,2
15.	Find the output y[n] of a system whose impulse response h[n] = {1,1,1} and the input signal x[n] = {3,-1,0,1,3,2,0,1,2,1} using overlap save method assuming the length of the block is 4.	02	L3	1,2
16.	In direct computation of N-point DFT of x(n) , how many evaluations are required 1) Complex multiplications 2) Complex additions 3) Real multiplications 4) Real additions 5) Trigonometric	02	L3	1,2
17.	Given x(n)= {n} ; 0 ≤n ≤7. Find X(k) using DIF-FFT algorithm.	02	L3	1,2
18.	Compute DFT of the sequence x(n)={1,2,3,4,4,3,2,1} using DITFFT algorithm.	02	L3	1,2
19.	Compute IDFT of the sequence X(K)={4,0,0,0,4,0,0,0} using DITFFT algorithm	02	L3	1,2
20.	Find IDFT of the sequence X(K)={20, 0, -4 + j4 , 0, -4, 0, -4- j4, 0 } using DIFFFT algorithm	02	L3	1,2

Module 3

21.	Explain the windows used in the FIR filters with equations	03	L2	1,2
22.	Design a linear phase Low Pass FIR filter using rectangular window for the following desired frequency response. $H_d(w) = 1 \quad ; \quad$ for $0 < n < 4$ — $0 \quad ; \quad$ otherwise	03	L3	1,2
23.	Design a linear phase Low Pass FIR filter using Hamming window for the following desired frequency response. $H_d(w) = e^{-j3w} \quad ; \quad$ for $\lvert w \rvert < \frac{3\pi}{4}$ $0 \quad ; \quad \lvert \frac{3\pi}{4} \rvert < \lvert w \rvert < \pi$	03	L3	1,2
24.	Design a linear phase Low Pass FIR filter using Bartlett window for the following desired frequency response $H_d(w) = e^{-j3w} \quad ; \quad$ for $\lvert w \rvert < \frac{3\pi}{4}$ $0 \quad ; \quad \lvert \frac{3\pi}{4} \rvert < \lvert w \rvert < \pi$	03	L3	1,2
25.	Design a linear phase Low Pass FIR filter using Hanning window for the following desired frequency response. $H_d(w) = e^{-j3w} \quad ; \quad$ for $\lvert w \rvert \leq \frac{3\pi}{4}$ $0 \quad ; \quad \lvert \frac{3\pi}{4} \rvert < \lvert w \rvert < \pi$	03	L3	1,2
26.	A low pass filter has desired frequency response. $H_d(w) = e^{-j3w} \quad ; \quad 0 < w < \frac{\pi}{2}$ $0 \quad ; \quad \lvert \frac{\pi}{2} \rvert < \lvert w \rvert < \pi$ Determine h(n) based on Frequency sampling technique	03	L3	1,2
27.	Obtain Linear phase realization for following system $y(n) = x(n) - 2x(n-1) + 0.5x(n-2) - 2x(n-3) + x(n-4)$	03	L3	1,2
28.	Obtain the **lattice structure** for the system described by difference equation $y(n) = x(n) + 0.40x(n-1) + 0.75x(n-2) + 0.333x(n-3)$	03	L3	1,2
29.	Obtain the direct form And **lattice structure** for the system described by difference equation $H(Z) = 1 + 2Z^{-1} + 0.333Z^{-2}$	03	L3	1,2

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Module 4

30.	Derive the expressions for order and cutoff frequency of Butter-worth filter	04	L3	1,2
31.	Explain the characteristics of the Butterworth Filter	04	L2	1,2
32.	Realize the given Filter using Direct form-1 & direct form-2 $$H(z)=\frac{8z^3-4z^2+11z-2}{\left(z-\frac{1}{4}\right)\left(z^2-z+\frac{1}{2}\right)}$$	04	L3	1,2
33.	Obtain the direct form-I, direct form –II , realization of the following system function. **y(n)=-0.1 y(n-1)+0.2y(n-2)+3x(n)+3.6x(n-1)+0.6x(n-2)**	04	L3	1,2
34.	Obtain the direct form-I, direct form-II, form realization for the following system. **y(n) =0 .75 y(n-1) - 0.125 y(n-2) + 6 x(n) + 7 x(n-1)**	04	L3	1,2
35.	Obtain the direct form-I, direct form-II for a digital filter described by the system function $$H(Z)=\frac{(1+0.33z^{-1})}{(1-0.2z^{-1})(1-.75z^{-1}+0.125z^{-1})}$$	04	L3	1,2
36.	Compare FIR & IIR filter	04	L2	1
37.	Design a digital Butterworth filter satisfying the constraints using bilinear transformations. $0.707 \le \lvert H(\omega)\rvert \le 1.0 ; 0 \le \omega \le \pi/2$ $\lvert H(\omega)\rvert \le 0.2 ; 3\pi/4 \le \omega \le \pi.$	04	L3	1,2
38.	Design a digital Butterworth filter satisfying the constraints $0.8 \le \lvert H(\omega)\rvert \le 1.0 ; 0 \le \omega \le \pi/4$ $\lvert H(\omega)\rvert \le 0.2 ; \pi/2 \le \omega \le \pi$. Apply Bilinear transformation method	04	L3	1,2

39.	Find the Direct form-I and Direct form-II for a causal LTI system with the following transfer function. $$H(z) = \frac{1 + \frac{1}{5}z^{-1}}{\left(1 - \frac{1}{2}z^{-1} + \frac{1}{3}z^{-2}\right)\left(1 + \frac{1}{4}z^{-1}\right)}$$	04	L3	1,2

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QUESTION BANK (MODULE – 05)

Subject: **POWER SYSTEM OPERATION AND CONTROL** Sub. Code: **18EE81**

POWER SYSTEM SECURITY:

1. Explain the major functions involved in system security.
2. List out the factors affecting system security and explain them briefly.
3. Define contingency analysis and explain its general procedure through its simplest form with the help of flow chart.
4. Define linear sensitivity factors and list out them. Also explain the contingency analysis using linear sensitivity factors with a neat flow chart.

OR

Explain in detail with a neat flow chart, the contingency analysis using DC Load flow methods.

5. Explain in detail with a neat flow chart, the contingency analysis using AC power flow methods.
6. Define Performance index for outages and explain 1P1Q method for contingency selection with a neat flow chart.

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Module -3
Quantum Computing

1. List out the difference between classical and Quantum Computing.
2. Explain Moore's law and its end
3. Define single, two and multi qubits. Explain the bloch sphere representation of qubit
4. Explain Identity matrix and Pauli's matrices operation on single qubit system.
5. What are conjugate and conjugate transpose matrices give an example.
6. Explain Hermitian and Unitary matrix with examples.
7. Find the inner product of $|1\rangle$ and $|0\rangle$ and explain the result.
8. Explain Normalization, orthonormality and orthogonality rules.
9. Discuss the working of Quantum Not gate and Pauli X, Y, Z gates. Hadamard gate, Phase gate(S gate) and T gate on single qubit system.
10. Discuss CNOT gate and its operation on four different input states.
11. Explain the working of swap gate and controlled Z gate on two qubit system.
12. Explain Taffoli gate.

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QUESTION BANK (MODULE – 05)

Subject: **POWER SYSTEM OPERATION AND CONTROL** Sub. Code: **18EE81**

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OR

Explain in detail with a neat flow chart, the contingency analysis using DC Load flow methods.

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6. Define Performance index for outages and explain 1P1Q method for contingency selection with a neat flow chart.

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Data Science And Machine Learning

from 5th AUGUST 2023 to 15th SEPTEMBER 2023 .

We wish him/her best of luck for all the future endeavours

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Issue Date: 18th SEPTEMBER 2023

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DEPARTMENT OF MECHANICAL ENGINEERING

(NBA ACCREDITED)

Time-table for the Academic Year 2022-23 (EVEN Semester) W.E.F 05/06/2023

Semester: **IV** | **Room No :313**

Class Teacher Name: **PROF.NATARAJ H N**

Proctor:**Dr.MOHAN AE** | Proctor: **PROF.NATARAJ H N**

PERIOD	1	2		3	4	12:50 pm - 01:45 pm	5	6	7
TIME	8:30am – 9:30am	9:30am – 10:30am	10:30am - 10:50am	10:50am - 11:50am	11:50am - 12:50pm		01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
DAY									
MON	21ME43 (FM)	21ME42 (MSJF)	TEA BREAK	21ME44 (MOM)	21MAT41 (MATHS)	LUNCK BREAK	21MEL46 (MMM LAB)—Batch 1/ 21INT49 (INTERNSHIP)----Batch 2		
TUE	21BE45 (BOE)	21MAT41 (MATHS)		21ME43 (FM)	21UH49 (UHV)		21ME42 (MSJF)	21ME44 (MOM)	SAMSKRUTIKA KANNADA (21KSK47)
WED	21ME43 (FM)	21ME44 (MOM)		21ME42 (MSJF)	21MT481 (SSE) Batch 2		FM LAB (NGR)- Batch 1/ MSJF LAB(NHN)-Batch 2		
THU	21ME42 (MSJF)	21BE45 (BOE)		21ME43 (FM)	21ME44 (MOM)		21MEL46 (MMM LAB)---Batch 2/ 21INT49 (INTERNSHIP)----Batch 1		
FRI	21MAT41 (MATHS)			FM LAB (NGR)- Batch 2/ MSJF LAB(NHN)-Batch 1			DIPMATHS		
SAT	21ME44 (MOM)	21ME43 (FM)		21MT481 (SSE) Batch 1	BALAKE KANNADA (21KBK47)				

SUBJECTS ALLOCATION

SUBJECT CODE	SUBJECT TITLE	FACULTY NAME	FACULTY CODE
21MAT41	COMPLEX ANALYSIS, PROBABILITY AND LINEAR PROGRAMMING	PROF.BHAVYA N P	BNP
21ME42	MACHINING SCIENCE AND JIGS & FIXTURES	PROF.NATARAJ H N	NHN
21ME43	FLUID MECHANICS	Dr.RAGAHAVENDRA G DESHPANDE	RGD
21ME44	MECHANICS OF MATERIALS	PROF. CHETAN B P	CBP
21BE45	BIOLOGY FOR ENGINEERS	Dr.CHAITRA B S	CBS
21MEL46	MECHANICAL MEASUREMENTS AND METROLOGY LAB	PROF.MAHESH S	MS
21KSK47/21KBK47	SAMSKRUTIKA KANNADA/BALAKE KANNADA	PROF. VIJAY KUMAR	VK
21MT481	SPREAD SHEETS FOR ENGINEERS	PROF.RAMKUMAR M	RKM
21UH49	UNIVERSAL HUMAN VALUES	PROF.RAMKUMAR M	RKM
21INT49	INTER/INTRA INSTITUTIONAL INTERNSHIP	PROF.NATARAJ H N/Dr.MOHAN A E	NHN/MAE

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Time-table for the academic year 2022-23 (Even Semester) W.E.F 20/03/2023

Semester: **VI** | **Room No : 412**

Class Teacher Name: **CHETAN B P**

Proctor: **MAHESH S** | Proctor: **MOHAN AE**

PERIOD	1	2		3	4		5	6	7
TIME / DAY	8:30am – 9:30am	9:30am – 10:30am	10:30am - 10:50am	10:50am - 11:50am	11:50am - 12:50pm	12:50 pm - 01:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
MON	18ME641 (NTM)	18ME62 (DME-II)	Tea Break	OPEN ELECTIVE	18ME61 (FEM)	LUNCH BREAK	18MEL66-BATCH1/18MEL67-BATCH2 (FEA LAB./HT LAB.)		
TUE	OPEN ELECTIVE	18ME61 (FEM)		18ME62 (DME-II)	18ME63 (HT)		**Mini Project** 1. Discussions / Interaction with Guide 2. Presentations		
WED	18ME641 (NTM)	18ME61 (FEM)		OPEN ELECTIVE	18ME62 (DME-II)		18MEL66-BATCH2/18MEL67-BATCH3 (FEA LAB./HT LAB.)		
THU	OPEN ELECTIVE	18ME641 (NTM)		18ME63 (HT)	18ME61 (FEM)		**Career Preparation** **1. Quantitative Aptitude test** **2. Mock Interviews** **3. Group Discussion**		
FRI	18ME62 (DME-II)	18ME63 (HT)		18ME62 (DME-II)	18ME63 (HT)		18MEL66-BATCH3/18MEL67-BATCH1 (FEA LAB./HT LAB.)		
SAT	18ME641 (NTM)	18ME63 (HT)		18ME61 (FEM)	**Technical / Motivational /Career Guidance Talk**		---		

SUBJECTS ALLOCATION

SUBJECT CODE	SUBJECT TITLE	FACULTY NAME	FACULTY CODE
18ME61	FINITE ELEMENT METHODS	PROF.PRAMOD S V	PSV
18ME62	DESIGN OF MACHINE ELEMENTS II	PROF.CHETAN B.P	CBP
18ME63	HEAT TRANSFER	Dr.BASAVARAJ G	BG
18ME641	NON-TRADITIONAL MACHINING	PROF.MAHESH S	MS
18ME65X	OPEN ELECTIVE		
18MEL66	COMPUTER AIDED MODELLING AND ANALYSIS LAB.	BATCH-1 PSV, BATCH-2 NGR, BATCH-3 CBP	
18MEL67	HEAT TRANSFER LAB.	BATCH-1,2 Dr.BG, BATCH-3 NHN	

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DEPARTMENT OF MECHANICAL ENGINEERING (NBA Accredited)

Time-table for the academic year 2022-23 (EVEN Semester) **w.e.f 13/02/2023**

Semester & Section: **VIII A**				Room No : **CLH 114**			
Class Teacher Name: **DR.BASAVARAJ S**							
Proctor: **PROF.PRAMOD S.V**				Proctor:**PROF.RAMKUMAR M**			Proctor:**PROF.CHETAN B P**
PERIOD	**1**	**2**		**3**	**4**		**5-7**
TIME / **DAY**	**8:30am – 9:30am**	**9:30am – 10:30am**		**10:50am - 11:50am**	**11:50am - 12:50pm**	**12:50 pm - 01:45 pm**	**1:45 pm - 4:00 pm**
MON	PROJECT WORK PHASE-II					LUNCH BREAK	INTERNSHIP
TUE	PROJECT WORK PHASE-II						INTERNSHIP
WED	TECHNICAL SEMINAR						INTERNSHIP
THR	TECHNICAL SEMINAR						INTERNSHIP
FRI	------	18ME81 (EE)	TEA BREAK	18ME824 (AE)	18ME824 (AE)		
SAT	------	18ME81 (EE)		18ME824 (AE)	18ME81 (EE)		

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18ME81	ENERGY ENGINEERING	DR.BASAVARAJ S	BS
18ME824	AUTOMOBILE ENGINEERING	PROF.A M MAHESHA	AMM
18MEP83	PROJECT WORK PHASE-II	PROF. RAMESH N G/ PROF. A M MAHESHA	NGR/ AMM
18MES84	TECHNICAL SEMINAR	DR.BASAVARAJ S/DR.BASAVARAJ G	BS/BG
18MEI85	INTERNSHIP	PROF.ANIL KUMAR PR	APR

Time-Table Coordinator

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Accredited by NAAC 'A' Grade and an ISO 9001:2015 and 14001:2015 Certified Institution

DEPARTMENT OF MECHANICAL ENGINEERING (NBA Accredited)

Time-table for the academic year 2022-23 (EVEN Semester) **w.e.f 13/02/2023**							
Semester & Section: **VIII B**				Room No : **CLH 313**			
Class Teacher Name:**PROF.RAMESH N G**							
Proctor: **PROF.ANILKUMAR P R**				Proctor:**Dr.BASAVARAJ GANIGER**			
PERIOD	**1**	**2**		**3**	**4**		**5-7**
TIME / **DAY**	**8:30am – 9:30am**	**9:30am – 10:30am**		**10:50am - 11:50am**	**11:50am - 12:50pm**	**12:50 pm - 01:45 pm**	**1:45 pm - 4:00 pm**
MON	PROJECT WORK PHASE-II					LUNCH BREAK	INTERNSHIP
TUE	PROJECT WORK PHASE-II						INTERNSHIP
WED	TECHNICAL SEMINAR						INTERNSHIP
THR	TECHNICAL SEMINAR						INTERNSHIP
FRI	------	18ME81 (EE)	TEA BREAK	18ME824 (AE)	18ME824 (AE)		
SAT	------	18ME81 (EE)		18ME824 (AE)	18ME81 (EE)		

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18ME81	ENERGY ENGINEERING	PROF.MOHAN AE	MAE
18ME824	AUTOMOBILE ENGINEERING	PROF.RAMESH NG	NGR
18MEP83	PROJECT WORK PHASE-II	PROF. RAMESH N G/ PROF. A M MAHESHA	NGR/ AMM
18MES84	TECHNICAL SEMINAR	DR.BASAVARAJ S/DR.BASAVARAJ G	BS/BG
18MEI85	INTERNSHIP	PROF.ANIL KUMAR PR	APR

Time-Table Coordinator

HOD
Professor & Head
Department of Mechanical Engineering
Sapthagiri College of Engineering
Bengaluru - 560 057

Principal
Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057
16/2/23

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SAPTHAGIRI COLLEGE OF ENGINEERING

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Department of Information Science & Engineering

ODD SEMESTER TIME-TABLE with effect from 31/11/2022

F-TLP-02/R0

Department/Branch	ISE	Semester: 3	Section: A
Academic Year	2022-23	Room No.	ALH-305
Class Teacher	Prof. Chandrashekar C M		

Proctor's Name: **Prof. Ramya R** Mobile No.: 8884816537 email:ramyar@sapthgiri.edu.in	Proctor's Name: **Prof. Sowmya Somanath** Mobile No.: 8884775216 e-mail:sowmyasomanath@sapthagiri.edu.in	Proctor's Name: **Prof.Priyanka M R** Mobile No.:9513356222 e-mail:priyankamr@sapthagiri.edu.in

PERIOD	1	2	BREAK	3	4	BREAK	5	6	7
TIME	8:30am - 9:30am	9:30 am - 10:30 am	10:30 - 10:50	10:50am - 11:50am	11:50am - 12:50pm	12:50 - 01:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
MON	21CS32	21CS33		21CS32 DS LAB/ 21CS33 ADE LAB		Lunch Break	21CS385	21KSK37	TUTORIAL
TUE	21CSL35 (A1)				21CS34		21MAT31	TUTORIAL	
WED	21CS34	21CS33		21CS32	21MAT31		21CSL35 (A2)		
THU	21CSL35 (A3)				21CS33		21SCR36	21CS34	21KBK37
FRI	21CS33	21CS32		21CS34	21MAT31		FORUM ACTIVITIES		
SAT	21MAT31	21CS32		21CS32 DS LAB/ 21CS33 ADE LAB					

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
21MAT31	Transform Calculus, Fourier Series and Numerical Techniques	Prof.Munirathnamma M	MM
21CS32	Data Structures and its Applications	Prof.Chandrashekar C M, Gayathri R	CCM, GR
21CS33	Analog and Digital Electronics	Prof.Suma J, Roopa KT	SJ, RKT
21CS34	Computer Organization and Architecture	Prof.Prerana Chaithra	PC
21CSL35	Object Oriented Programming with JAVA Laboratory	Prof.Manasa P M	MPM
21KSK37	Samskrutika Kannada	Prof.Lakshmi R K	LRK
21KBK37	Balake Kannada	Prof.Lakshmi R K	LRK
21CS385	C++ Programming	Prof.Manasa P M	MPM
21SCR36	Social Connect and Responsibility	Prof.Ramya R	RR

Time Table Coordinator

HOD

Dr H.R Ranganatha
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Department of Information Science & Engineering

ODD SEMESTER TIME-TABLE with effect from 31/11/2022

F-TLP-02/R0

Department/Branch	ISE	Semester : 3	Section : B
Academic Year	2022-23	Room No.	ALH-302
Class Teacher	Prof. Manasa P M		

Proctor's Name: **Prof. Suma J**
Mobile No.: 9480636560
email:suma@sapthgiri.edu.in

Proctor's Name: **Prof. Chandrashekar CM**
Mobile No.: 9945993235
e-mail:chandrashekar@sapthagiri.edu.in

PERIOD	1	2	BREAK	3	4	BREAK	5	6	7
TIME	8:30am - 9:30am	9:30 am - 10:30 am	10:30 - 10:50	10:50am - 11:50am	11:50am - 12:50pm	12:50 - 01:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
MON	21CSL35 (B1)				21MAT31	Lunch Break	21CS34	21CS385	TUTORIAL
TUE	21CS33	21CS34		21CS32 DS LAB/ 21CS33 ADE LAB			21CS32	21KSK37	TUTORIAL
WED	21CS32	21CS33		21CS32 DS LAB/ 21CS33 ADE LAB			FORUM ACTIVITIES		
THU	21MAT31	21CS32		21CS33	21CS34		21CSL35 (B2)		21KBK37
FRI	21CS33	21MAT31		21SCR36			21CSL35 (B3)		
SAT	21CS34	21CS33		21MAT31	21CS32				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
21MAT31	Transform Calculus, Fourier Series and Numerical Techniques	Prof.Munirathnamma M	MM
21CS32	Data Structures and its Applications	Prof.Chandrashekar C M, Gayathri R	CCM, GR
21CS33	Analog and Digital Electronics	Dr. H R Ranganatha / Prof. Rajeshwari R	HRR , RJ
21CS34	Computer Organization and Architecture	Prof.Prerana Chaithra	PC
21CSL35	Object Oriented Programming with JAVA Laboratory	Prof.Manasa P M	MPM
21KSK37	Samskrutika Kannada	Prof.Lakshmi R K	LRK
21KBK37	Balake Kannada	Prof.Lakshmi R K	LRK
21CS385	C++ Programming	Prof.Swetha K B	SKB
21SCR36	Social Connect and Responsibility	Prof.Roopa K T	RKT

Time Table Coordinator

HOD

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Department of Information Science & Engineering

ODD SEMESTER TIME-TABLE with effect from 10/10/2022

F-TLP-02/R0

Department/Branch	ISE	Semester :5	Section :A
Academic Year	2022-23	Room No.	ALH-413
Class Teacher	Prof. Swetha K B		

Proctor's Name: **Prof. Ambika S** Mobile No.: 8147232284 email:ambika@sapthgiri.edu.in	Proctor's Name: **Prof. Veena D** Mobile No.: 9741606703 e-mail:veenadhavalgi@sapthagiri.edu.in	Proctor's Name: **Prof. Chaitanya V** Mobile No.:8884240572 e-mail:chatanyav@sapthagiri.edu.in

PERIOD	1	2	BREAK	3	4	BREAK	5	6	7
TIME	8:30am – 9:30am	9:30 am – 10:30 am	10:30 - 10:50	10:50am - 11:50am	11:50am - 12:50pm	12:50 - 01:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
DAY									
MON	18CS54	18CS55		18CS56	18CS51	Lunch Break	CN-LAB18CSL57(A2) DBMS LAB 18CSL58(A1)		
TUE	18CS52	18CS51		18CS53	18CS55		CN-LAB18CSL57(A3) DBMS LAB 18CSL58(A2)		
WED	18CS54	18CS56		18CS55	18CS53		18CIV59	FORUM ACTIVITY	
THU	18CS53	18CS54		18CS51	18CS52		TUTORIAL		
FRI	CN-LAB18CSL57(A1), DBMS LAB 18CSL58(A3)				18CS56		18CS55	18CS53	18CS52
SAT	18CS51	18CS56		18CS52	18CS54				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18CS51	Management & Entrepreneurship for IT industry	Prof.Gayathri R	GR
18CS52	Computer networks and Security	Prof.Swetha KB	SKB
18CS53	Database Management System	Prof.Chaitanya V	CV
18CS54	Automata Theory & Computability	Prof.Rajeshwari R	RJ
18CS55	Applications development using python	Prof.Ambika S	AS
18CS56	Unix programming	Prof.Nandini Gowda P	NG
18CSL57	Computer network Laboratory	Prof.Swetha KB/ Prof. Veena Dhavalgi(A1,A3)/ Prof.Ramya R(A2)	SKB, VD, RR
18CSL58	DBMS Laboratory with Mini Project	Prof.Chaitanya V/Prof. Suma J(A1, A2, A3)	CV, SJ
18CIV59	Environmental Studies Civil/Environmental	Prof.Bhavya C H	BCH

Time Table Coordinator

HOD

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Department of Information Science & Engineering

ODD SEMESTER TIME-TABLE with effect from 10/10/2022

F-TLP-02/R0

Department/Branch	ISE	Semester :5	Section :B
Academic Year	2022-23	Room No.	ALH-306
Class Teacher	Prof. Nandini Gowda P		

Proctor's Name: **Prof. Roopa KT** Mobile No.: 9019269460 email:roopakt@sapthgiri.edu.in	Proctor's Name: **Prof.Rajeshwari R** Mobile No.: 9611755753 e-mail:rajeshwarir@sapthagiri.edu.in

PERIOD	1	2	BREAK	3	4	BREAK	5	6	7
TIME	8:30am – 9:30am	9:30 am – 10:30 am	10:30 - 10:50	10:50am - 11:50am	11:50am - 12:50pm	12:50 - 01:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
DAY									
MON	18CS56	18CS51		18CS53	18CS55	Lunch Break	TUTORIAL		
TUE	18CS53	18CS55		18CS52	18CS54		18CIV59	FORUM ACTIVITY	
WED	18CS51	18CS54		18CS56	18CS52		CN-LAB18CSL57(B2) DBMS LAB 18CSL58(B1)		
THU	CN-LAB18CSL57(B3) ,DBMS LAB 18CSL58(B2)				18CS53		18CS55	18CS56	18CS54
FRI	18CS54	18CS56		18CS51	18CS52		CN-LAB18CSL57(B1) DBMS LAB 18CSL58(B3)		
SAT	18CS52	18CS53		18CS55	18CS51				

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18CS51	Management & Entrepreneurship for IT industry	Prof.Gayathri R	GR
18CS52	Computer networks and Security	Prof.Swetha KB	SKB
18CS53	Database Management System	Prof.Chaitanya V	CV
18CS54	Automata Theory & Computability	Prof.Roopa KT	RKT
18CS55	Applications development using python	Prof.Ambika S	AS
18CS56	Unix programming	Prof.Nandini Gowda P	NG
18CSL57	Computer network Laboratory	Prof.Nandini Gowda P, Prof.Ramya R(B1,B3)/ Prof.Veena D(B2)	NG, RR
18CSL58	DBMS Laboratory with Mini Project	Prof.Prerana Chaithra, Prof.Roopa KT(B2), Prof.Suma(B3), Prof.Rajeshwari R(B1)	PC, RKT, SJ, RJ
18CIV59	Environmental Studies Civil/Environmental	Prof.Mamatha HK	MHK

Time Table Coordinator

HOD

Dr H.R Ranganatna
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Department of Information Science & Engineering

ODD SEMESTER TIME-TABLE with effect from 19/09/2022

F-TLP-02/R0F-TLP-02/R0

Department/Branch	ISE	Semester : 7th	*Section: A*
Academic Year	2022-23	Room No.	ALH-301
Class Teacher	Prof.Priyanka MR		
Proctor's Name :Prof.prerana Chaithra Mobile No.: 9886715998 e-mail:preranachaithra@sapthagiri.edu.in		Proctor's Name :Prof.Anil Kumar S Mobile No.: 8088743856 e-mail:anilkumar_s@sapthagiri.edu.in	

PERIOD	1	2	BREAK	3	4	BREAK	5	6	7
TIME	8:30am – 9:30 am	9:30am – 10:30am	10:30am - 10:50am	10:50am - 11:50am	11:50am - 12:50pm	12:50pm - 1:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
DAY									
MON	18CS72	18CS744		18CS71	18CS731	Lunch Break	18CSL76(A1)		
TUE		18CSL76(A2)					18CS744	18CS731	18CS71
WED	18CS752	18CSL76(A3)					PYTHON		
THU	18CS731	18CS72		18CS752	18CS71		JAVA		
FRI	18CS752	18CS71		18CS72	18CS744		PROJECT WORK PHASE1+SEMINAR (18CSP77)		
SAT	18CS752	INTERNSHIP							

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18CS71	Artificial Intelligence and Machine Learning	Prof.Sowmya Somanath	SS
18CS72	Big Data Analytics	Prof.Priyanka MR	PMR
18CS731	Software Architecture and Design Patterns	Prof.Ramya R	RR
18CS744	Cryptography	Prof.Veena Dhavalgi	VD
18CS752	Python applications programming	Prof.Ambika S	AS
18CSL76	Artificial Intelligence and Machine Learning Laboratory	Prof.Sowmya Somanath	SS
18CSP77	Project Work Phase – 1	Prof. Prerana Chaithra	PC
-	Basic and core JAVA	Prof.Manasa, Prof.Priyanka	MPM, PMR
-	PYTHON	Prof.Ambiks S	AS

Time Table Coordinator

HOD

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Department of Information Science & Engineering

ODD SEMESTER TIME-TABLE with effect from 19/09/2022

F-TLP-02/R0F-TLP-02/R0

Department/Branch	ISE	Semester : 7th	*Section: B*
Academic Year	2022-23	Room No.	ALH-301
Class Teacher	Prof.Veena D		
Proctor's Name :Prof.Gayathri R Mobile No.: 8147290734 e-mail:gayathrir@sapthagiri.edu.in		Proctor's Name :Prof.Nandini Gowda P Mobile No.: 9008301333 e-mail:nanadinigowdap@sapthagiri.edu.in	

PERIOD	1	2	BREAK	3	4	BREAK	5	6	7
TIME	8:30am – 9:30 am	9:30am – 10:30am	10:30am - 10:50am	10:50am - 11:50am	11:50am - 12:50pm	12:50 pm - 1:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
DAY									
MON		18CSL76(B1)				Lunch Break	18CS744	18CS72	18CS71
TUE	18CS71	18CS731		18CS744	18CS72		18CSL76(B2)		
WED	18CS752	18CS744		18CS731	18CS71		PYTHON		
THU	18CS731	18CS72		18CS752	18CS71		JAVA		
FRI	18CS752	18CSL76(B3)					PROJECT WORK PHASE1+SEMINAR (18CSP77)		
SAT	18CS752	INTERNSHIP							

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18CS71	Artificial Intelligence and Machine Learning	Prof.Sowmya Somanath	SS
18CS72	Big Data Analytics	Prof.Priyanka MR	PMR
18CS731	Software Architecture and Design Patterns	Prof.Ramya R	RR
18CS744	Cryptography	Prof.Veena Dhavalgi	VD
18CS752	Python applications programming	Prof.Ambika S	AS
18CSL76	Artificial Intelligence and Machine Learning Laboratory	Prof.Priyanka MR	PMR
18CSP77	Project Work Phase – 1	Prof. Prerana Chaithra	PC
-	Basic and core JAVA	Prof.Manasa, Prof.Priyanka	MPM, PMR
-	PYTHON	Prof.Ambiks S	AS

Time Table Coordinator

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F-TLP-02/R0

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DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Time-table for the academic year 2022-23 (**EVEN** Semester)									
Semester & Section: **4h IS-A**					Room No : **ALH 301**				
Class Teacher Name: Prof. Ambika S					Proctor's Name: Prof.Ramya R, Prof. Sowmya Somanath Prof.Priyanka MR,				
PERIOD	1	2		3	4		5	6	7
TIME / DAY	8:30am – 9:30am	9:30am – 10:30am	10:30am - 10:50am	10:50am - 11:50am	11:50am - 12:50pm	12:50 pm - 01:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
MON	21BE45	21CS44		21CS43	21CS42		21CSL46 (A1) Python Lab		
TUE	21UH49	21CS41		21CS44	21BE45				
WED	21CS41	21CS43		21CS43 A2 (MP Lab) 21CS42 A1 (DAA Lab)			21CSL46 (A2) Python Lab		
THU	21CS43	21BE45		21CS43 A1 (MP Lab) 21CS42 A2 (DAA Lab)			21CS44	21CS42	21CS482
FRI	21CSL46 (A3) Python Lab				21CIP47		21CS41	21CS42	
SAT	21CS44	21CS43		21CS41	21CS42				

Subjects Allocation			
Subject Code	**Subject Title**	**Faculty Name**	**Faculty Code**
21CS41	Mathematical Foundations for	Prof. Sushma P M	SPM
21CS42	Design and Analysis of Algorithms	Prof. Ambika S	AS
21CS43	Microcontroller and Embedded System	Prof. Suma J	SJ
21CS44	Operating System	Prof. Chandrashekhar C M	CCM
21BE45	Biology For Engineers	Prof. Roopa K T	RKT
21CSL46	Python Programming Laboratory	Prof. Sowmya Somanath	SS
21CIP47	Constitution of India & Professional Ethics	Prof. Nagesh V N	NVN
21CS482	Unix Shell Programming	Prof. Manasa P M	MPM
21UH49	Universal Human Values	Prof. Veena Dhavalgi	VD

Department Time-Table Coordinator

HOD

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F-TLP-02/R0

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DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Time-table for the academic year 2022-23 (**EVEN** Semester)									
Semester & Section: **4th IS- B**					Room No: **ALH 302**				
Class Teacher Name: Prof. Shwetha K B					Proctor's Name: Prof. Suma C, Prof.Chandrashekar CM				
PERIOD	1	2		3	4		5	6	7
TIME DAY	8:30am – 9:30am	9:30am – 10:30am	10:30am - 10:50am	10:50am - 11:50am	11:50am - 12:50pm	12:50 pm - 01:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
MON	21CS43	21CS44		21CS41	21BE45				
TUE	21CS42	21CS43		21CS43 B2(MP Lab) 21CS42 B1(DAA Lab)			21CSL46 (B1) Python Lab		
WED	21BE45	21CS42		21CS41	21CS44		21CS43	21UH49	
THU	21CS43 B1(MP Lab) 21CS42 B2 (DAA Lab)			21CS44	21CS41		21CSL46 (B2) Python Lab		
FRI	21CS44	21CIP47		21BE45	21CS42		21CSL46 (B3) Python Lab		
SAT	21CS42	21CS41		21CS482	21CS43				

Subjects Allocation			
Subject	**Subject Title**	**Faculty Name**	**Faculty Code**
21CS41	Mathematical Foundations for	Prof. Sushma P M	SPM
21CS42	Design and Analysis of Algorithms	Prof. Ambika S	AS
21CS43	Microcontroller and Embedded System	Prof. Suma J	SJ
21CS44	Operating System	Prof. Manasa P M	MPM
21BE45	Biology For Engineers	Prof. Roopa K T	RKT
21CSL46	Python Programming Laboratory	Prof. Swetha K B	SKB
21CIP47	Constitution of India & Professional Ethics	Prof. Nagesh V N	NVN
21CS482	Unix Shell Programming	Prof. Manasa P M	MPM
21UH49	Universal Human Values	Prof. Veena Dhavalgi	VD

Department Time-Table Coordinator

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Bengaluru - 560 057

HOD

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BENGALURU-560 057

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DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Time-table for the academic year 2022-23 (EVEN Semester)

Semester & Section: **6th IS-A**					Room No : **ALH 301**				
Class Teacher Name: Prof. Chaitanya V					Proctor's Name: Prof. Ambika S, Prof. Chaitanya V, Prof. Veena D				
PERIOD	1	2		3	4		5	6	7
TIME	8:30am – 9:30am	9:30am – 10:30am	10:30am - 10:50am	10:50am - 11:50am	11:50am - 12:50pm	12:50 pm - 01:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
DAY									
MON	18CS643 (CC)	18CS63 (WEB)		OE	18IS61 (FS)		A2(18ISL66 ST LAB) A3(18ISL67 FS LAB)		
TUE	OE	18IS61 (FS)		18CS643 (CC)	18CS63 (WEB)		A3(18ISL66 ST LAB) A1(18ISL67 FS LAB)		
WED	18IS61 (FS)	18IS62 (ST)		OE	18CS63 (WEB)		PLACEMENT AND TRAINING		
THU	OE	18IS61 (FS)		18CS643 (CC)	18IS62 (ST)		18CSMP68 MAD LAB (A2)		TUTORIAL CLASS
FRI	A1(18ISL66 ST LAB) A2(18ISL67 FS LAB)				18CS643 (CC)		18IS62 (ST)	18CSMP68 MAD LAB (A3)	
SAT	18CS63 (WEB)	18IS62 (ST)		18CSMP68 MAD LAB (A1)					

Subjects Allocation

Subject Code	Subject Title	Faculty Name	Faculty Code
18IS61	File Structures (FS)	Prof. Priyanka M R	PMR
18IS62	Software Testing (ST)	Prof. Chaitanya V	CV
18CS63	Web Technology and its applications	Prof. Ramya R	RR
18CS643	Professional Elective -1 (Cloud Computing and its Applications) (CC)	Prof. Nandini Gowda P	NP
-	Open Elective – (OE)	-	-
18ISL66	Software Testing Laboratory (ST LAB)	Prof. Chaithanya V	CV
18ISL67	File Structures Laboratory with mini project (FS LAB)	Prof. ChandraShekhar C M	CCM
18CSMP68	Mobile Application Development (MAD)	Prof. Veena Dhavalgi	VD

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DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Time-table for the academic year 2022-23 (**EVEN** Semester)									
Semester & Section: **6th IS- B**					Room No : **ALH 302**				
Class Teacher Name: Prof. Priyanka M R					Proctor's Name: Prof. Roopa K T, Prof. Rajeshwari R				
PERIOD	1	2		3	4		5	6	7
TIME	8:30am – 9:30am	9:30am – 10:30am	10:30am - 10:50am	10:50am - 11:50am	11:50am - 12:50pm	12:50 pm - 01:45 pm	01:45 pm - 02:40 pm	02:40 pm - 03:35 pm	03:35 pm - 04:30 pm
DAY									
MON	18IS62 (ST)	18IS61 (FS)		OE	18CS643 (CC)		PLACEMENT AND TRAINING		
TUE	OE	18CS63 (WEB)		18IS62 (ST)	18IS61 (FS)		18CSMP68 MAD LAB (B1)		TUTORIAL
WED	18CSMP68 MAD LAB (B3)			OE	18IS62 (ST)		B1(18ISL66 ST LAB) B2(18ISL67 FS LAB)		
THU	OE	18CS643 (CC)		18CS63 (WEB)	18IS61 (FS)		B2(18ISL66 ST LAB) B3(18ISL67 FS LAB)		
FRI	18IS61 (FS)	18CS643 (CC)		18CS63 (WEB)	18IS62 (ST)		B3(18ISL66 ST LAB) B1(18ISL67 FS LAB)		
SAT	18CSMP68 MAD LAB (B2)			18CS63 (WEB)	18CS643 (CC)				

Subjects Allocation			
Subject	**Subject Title**	**Faculty Name**	**Faculty Code**
18IS61	File Structures (FS)	Prof. Priyanka M R	PMR
18IS62	Software Testing (ST)	Prof. Chaitanya V	CV
18CS63	Web Technology and its applications	Prof. Ramya R	RR
18CS643	Professional Elective -1 (Cloud Computing and its Applications) (CC)	Prof. Nandini Gowda P	NP
-	Open Elective –(OE)	-	-
18ISL66	Software Testing Laboratory (ST LAB)	Prof. Ramya R	RR
18ISL67	File Structures Laboratory with mini project (FS LAB)	Prof. Priyanka M R	PMR
18CSMP68	Mobile Application Development (MAD)	Prof. Nandini Gowda P	NP

Department Time-Table Coordinator

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Class :.....4th..... Sec :..... Subject :.....MES..... code: 21CS43

Sl. No	USN	NAME	11/7	18/7	25/7	1/8	8/8				
			1	2	3	4	5	6	7	8	9
1	1SG21IS015	B R Gnaneshwar	1	2	2	3	4				
2	1SG21IS093	S K MD Asib	1	2	3	3	4				
3	1SG20IS104	Ujwal N	1	1	2	3	4				
4	1SG21IS116	Vinayak S	1	2	3	4	4				
5	1SG21IS046	Dheeraj D	1	2	3	4	5				
6	1SG21IS083	Sanjay B	1	2	3	4	5				
7	1SG21IS074	Rohan R	1	1	2	3	4				
8	1SG21IS013	Bhanu Teja K	1	2	3	4	4				
9	1SG21IS045	Karthik L	1	1	2	3	4				
10	1SG22IS406	Jeevan B M	1	2	3	4	4				
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DEPARTMENT OF ISE

2022-2023

SEMESTER : 4th A& B

SUBJECT: Microcontroller and embedded system

SUB CODE :21CS43

MODULE 1

1. Differentiate microprocessor & microcontroller.
2. Differentiate CISC and RISC architectures.
3. Which are the silent features of ARM instruction set?
4. With a neat diagram explain the ARM based embedded device microcontroller.
5. Explain the structure of ARM cross development kit. **OR** With a neat diagram explain the different software components of an embedded system.
6. Explain ARM core dataflow model with a neat diagram.
7. Explain the various fields in current program status register (CPSR) with neat diagram.
8. Explain the various modes of operation of ARM processor.
9. Explain the programmer's model of ARM processor with complete register sets available. OR Explain registers used under various modes.
10. With neat diagram explain the various blocks in a 3 stage pipeline of ARM processor organization.
11. Explain briefly pipeline execution characteristics.
12. Explain interrupt, exception and vector table.
13. Explain pipeline and interrupts used in ARM processor.
14. What are the different techniques of core extensions?
15. Discuss the following with neat diagrams
    a. Von Neumann architecture with cache
    b. Harvard architecture with TCM
16. Briefly explain how coprocessors can be attached to ARM processor.
17. Explain RISC design philosophy.
18. Explain the important design rules of RISC philosophy.
19. Explain ARM design philosophy
20. With a neat diagram explain the different general purpose registers of ARM processors.

MODULE 2 & 3

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1. Explain the MOV instruction set provided by ARM7 with the example for each.

2. Brief about the categories of Load Store instructions used with ARM.

3. Explain the ARM Single Register and Multiple Register load store addressing modes with example.

4. Explain Co Processor instructions of ARM Processor.

5. Write a note on Profiling and Cycle Counting.

6. Design ARM assembly language program to perform the addition and multiplication of two 32bit numbers.

7. Explain the scheduling of following instructions with respect to the ARM9TDMI pipeline implementation, i) STR ii) LDRH iii) B Label

8. Define instruction scheduling? Explain the rules summarizing the cycle timings for common instruction classes on the ARM9TDMI.

9. Explain the various looping constraints used in ARM.

10. Explain the following instructions with syntax and examples.

i. MOV

ii. SWI

iii. MSR

iv. TST

11. Discuss the portability issues of Arm core.

12. Explain unaligned data and endianness with an example.

13. Explain division implementation in ARM. What are different types of division routine used to implement division in ARM.

14. Explain scheduling of load instruction.

15. Explain C looping structures.

MODULE 4

1. Explain the fundamental issues in hardware software co-design.
2. Explain the different communication buses used in automotive application.
3. Write a note on message passing.
4. Explain with a neat diagram, the core of an embedded system.
5. What is the difference between embedded and general computing system.
6. Write a note on types of processors or controller used in embedded system.
7. Write a short note on Sensors and actuators.

8. Explain the working of a seven segment LED display.
9. Explain embedded firmware.
10. Explain embedded firmware.
11. Write a note on
    a. RESET
    b. Watch dog timer
    c. Brown out protection circuit

MODULE 5

1.What is an operating system? What are the primary functions of an OS?

2.Explain the operating system architecture.

3. Explain monolithic and microkernel. Which one of this is used in RTOS?

4. Define process. Explain in detail the structure, memory organization and state transition of the process.

5. Discuss race condition.

6. What is deadlock? What are the different conditions favoring deadlock?

7. Explain the concept of binary and counting semaphores.

8. Define thread. Give memory model of a thread

9. Discuss different IPC mechanisms adopted by various kernels.

10. Explain Embedded System Development environment with a neat block diagram highlighting the importance of IDE.

11. Discuss boundary scan based hardware debugging in detail.

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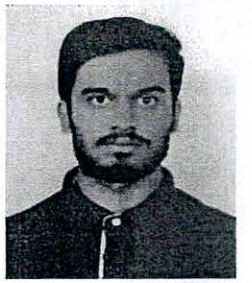

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(12 week course)

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Coordinator, NPTEL
IIT Kharagpur

Indian Institute of Technology Kharagpur

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Online Assignments	20.39/25	Proctored Exam	48.62/75

Total number of candidates certified in this course: **5647**

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Professor and Dean (Academics)
IIIT Hyderabad

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NPTEL, Coordinator
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Online Assignments	20.39/25	Proctored Exam	55.5/75

Total number of candidates certified in this course: **5647**

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Professor and Dean (Academics)
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Online Assignments	24.13/25	Proctored Exam	46.5/75

Total number of candidates certified in this course: **9534**

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Programming in Java

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Online Assignments	23.97/25	Programming Assignment	25/25	Proctored Exam	35.42/50

Total number of candidates certified in this course: 6899

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Coordinator, NPTEL
IIT Kharagpur

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DATE OF ISSUE : 15 SEPTEMBER 2023

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Jun 14, 2023

GOURAV RAO Y

has successfully completed

Deep Learning with PyTorch : Generative Adversarial Network

an online non-credit project authorized by Coursera Project Network and offered through Coursera

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Dhulasi Dheepthi D

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Date

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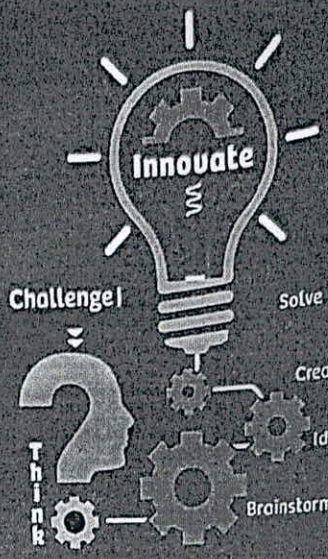
August 02-09, 2023



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Dileep Mangsuli
Head, Development Center
Siemens Healthineers

Prof. Sultan Haider
Founder and Head of Innovation Think Tank
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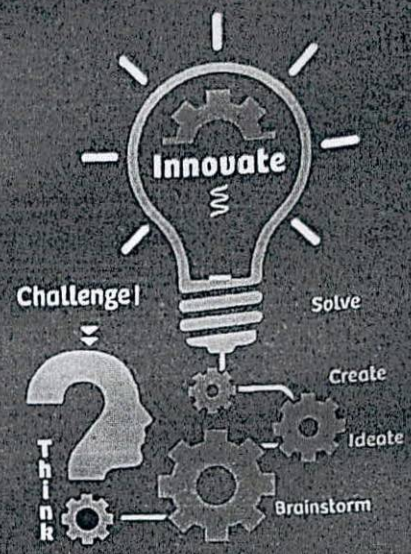
August 02-09, 2023



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Head, Development Center
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