

तीर्थकर महावीर विश्वविद्यालय  
Teerthanker Mahaveer University  
An Ultimate Destination for World Class Education

# COURSE FILE

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## FACULTY OF ENGINEERING

### DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

**Program** : B.Tech. CSE  
**Academic Year** : 2018-19  
**Faculty Member** : Dr. Amit K Sharma  
**Faculty Email Id** : dramit.engineering@tmu.ac.in  
**Course Name** : Engineering Physics  
**Course Code** : EAS112  
**Semester** : I

  
Director  
Faculty of Engineering  
Teerthanker Mahaveer University  
Moradabad



# 1. Academic Calendar Session: 2018-19

## Academic Calendar for the Session 2018-19

Activity	Odd Semester	Even Semester
Commencement of Semester	August 01, 2018 (All odd semester programs except 1 <sup>st</sup> Sem.) August 10, 2018 (1 <sup>st</sup> semester of all programs)	January 14, 2019 (All even Semester Programs)
Last date of depositing Semester Tuition Fee (without late fee fine)	August 18, 2018	February 12, 2019
Founders Day	September 14, 2018	-
CT-I	September 27 - 29, 2018	February 26 - 28, 2019
Sports Events	College teams & trials: October 04-06, 2018	TMU Intercollegiate : February 11 - 23, 2019
Last day of Submission of Examination Form	October 10, 2018	March 12, 2019
CT-II	November 01 - 03, 2018	April 11 - 13, 2019
Last Teaching Day of Semester	December 07, 2018	May 04, 2019
Preparatory Leave & CT-III	December 08 - 13, 2018	May 06 - 10, 2019
External Examination (Theory & Practical)	December 14 - 29, 2018	May 11 - 31, 2019
Vacation/Education Tour/Training for students/ FDPs	December 30, 2018 - January 12, 2019	June 01 - July 31, 2019



### 3. Syllabus

#### Course Perspective:

To understand the fundamentals of physics like interference of light, diffraction, Polarization, elements of material science, special theory of relativity etc.

#### Course Outcomes (COs)

Course Outcomes:	On completion of the course, the students will be :
CO1.	Understanding the basic concepts of interference, diffraction and polarisation.
CO2.	Understanding the concept of bonding in solids and semiconductors.
CO3.	Understanding the special theory of relativity.
CO4.	Applying special theory of relativity to explain the phenomenon of length contraction, time dilation, mass-energy equivalence etc.
CO5.	Applying the concepts of polarized light by the Brewster's and Malus Law

#### Course Contents-

**Unit A (Unit A is for building a foundation and shall not be a part of examination)**

*Optics- Properties of light, Lens, Mirror, Focal length, Intensity, Power, Eye-piece, Work, Energy and its types, Waves, longitudinal and transverse waves, Time period, Frequency*

#### Unit-I

(08 Lectures)

**Interference of Light:** Introduction, Principle of Superposition, Interference due to division of wavefront: Young's double slit experiment, Theory of Fresnel's Bi-Prism, Interference due to division of amplitude: parallel thin films, Wedge shaped film, Michelson's interferometer, Newton's ring.

#### Unit-II

(08 Lectures)

**Diffraction:** Introduction, Types of Diffraction and difference between them, Condition for diffraction, difference between interference and diffraction. **Single slit diffraction:** Quantitative description of maxima and minima with intensity variation, linear and angular width of central maxima. **Resolving Power:** Rayleigh's criterion of resolution, resolving power of diffraction grating and telescope.

#### Unit-III

(08 Lectures)

**Polarization:** Introduction, production of plane polarized light by different methods, Brewster's and Malus Law. Quantitative description of double refraction, Nicol prism, Quarter & half wave plate, specific rotation, Laurent's half shade polarimeter.

#### Unit-IV

(08 Lectures)

**Elements of Material Science:** Introduction, Bonding in solids, Covalent bonding and Metallic bonding, Classification of Solids as Insulators, Semi-Conductor and Conductors, Intrinsic and Extrinsic Semiconductors, Conductivity in Semiconductors, Determination of Energy gap of Semiconductor. **Hall Effect:** Theory, Hall Coefficients and application to determine the sign of charge carrier, Concentration of charge carrier, mobility of charge carriers.

#### Unit-V

(08 Lectures)

#### 4. Handouts

##### Session Plan:

Session Nos.	Topics	Pedagogy	References	Session outcome (Bloom's Taxonomy)	Course Outcome (COs)
1.	Properties of light, <i>Lance</i> , <i>Mirror</i> , <i>Focal length</i> , <i>Intensity</i> , <i>Power</i> , <i>Eye-piece</i>	Q & A, &discussion	R1, R2	L1, L2	CO1
2.	Work, Energy and its types, Waves, longitudinal and transverse waves, Time period, Frequency	Q & A, &discussion	R1, R2	L1, L2	CO1
3.	Introduction of Interference, Principle of Superposition,	Lecture &discussion	R1, R2, R3	L1, L2	CO1
4.	Interference due to division of wavefront: Young's double slit experiment	Lecture &discussion	R1, R2, R3	L1, L2, L3	CO1
5.	Analytic Treatment of Young's Experiment	Lecture &discussion,	R1, R2, R3	L2, L3	CO1
6.	Theory of Fresnel's Bi-Prism	Lecture &discussion	R1, R2, R3	L2, L3	CO1
7.	Interference due to division of amplitude: parallel thin films	Lecture &discussion	R1, R2, R3	L2, L3	CO1
8.	Wedge shaped film	Lecture &discussion	R1, R2, R3	L2, L3	CO1
9.	Newton's ring	Presentation, Lecture & lab work	R1, R2, R3	L2, L3	CO1
10.	Newton's Ring	Presentation, Lecture & lab work	R1, R2, R3	L2, L3	CO1
11.	Michelson's interferometer	Lecture &discussion	R1, R2, R3	L2, L3	CO1
12.	-Continued-	Lecture &discussion	R1, R2, R3	L2, L3, L4	CO1
13.	Introduction, Types of Diffraction and difference between them	Q & A, discussion	R1, R2, R3	L2, L4	CO1
14.	Condition for diffraction, difference between	Lecture & Discussion	R1, R2, R3	L2, L4	CO1



	Conductors				
29.	Intrinsic and Extrinsic Semiconductors	Q & A; discussion	R4	L1, L4	CO2
30.	Conductivity in Semiconductors, Determination of Energy gap of Semiconductor	Lecture & Discussion	R4	L2, L3	CO2
31.	<b>Hall Effect:</b> Theory, Hall Coefficients and application to determine the sign of charge carrier, Concentration of charge carrier, mobility of charge carriers.	Presentation, Lecture & Discussion	R4	L2, L3	CO2
32.	Special Theory of Relativity: Introduction	Classroom Activity, Q & A ; discussion	R3, R5	L1, L2	CO3
33.	Inertial and non-inertial frames of Reference	Activity, Q & A ; discussion	R3, R5	L1, L2, L4	CO3
34.	Postulates of special theory of relativity	Lecture & Discussion	R3, R5	L1, L2	CO3
35.	Galilean and Lorentz Transformations	Lecture & Discussion	R3, R5	L1, L2, L4	CO3
36.	-Continued-	Lecture & Discussion, Classroom activity	R3, R5	L1, L2, L4	CO3
37.	Length contraction	Lecture & Discussion, Classroom activity	R3, R5, R7, R8	L2, L3	CO4
38.	Time Dilation	Lecture & Discussion, Classroom activity	R3, R5, R7, R8	L2, L3	CO4
39.	Relativistic addition of velocities	Lecture & Discussion	R3, R5, R7, R8	L2, L3	CO4
40.	Variation of mass with velocity	Lecture & Discussion	R3, R5, R7, R8	L2, L3	CO4
41.	Mass-Energy equivalence	Lecture & Discussion	R3, R5, R7, R8	L2, L3	CO4

**L1= Remembering, L2= Understanding, L3=Applying, L4=Analyzing, L5=Evaluating, L6=Creating**

**Evaluation Scheme**

<b>Attendance</b>	<b>20 %</b>
<b>Assignment</b>	<b>20%</b>
<b>CT1 Exam</b>	<b>20 %</b>
<b>CT2 Exam</b>	<b>20 %</b>
<b>CT3 Exam</b>	<b>20 %</b>



	Explain the formation of interference fringes by means of Fresnel's biprism when a monochromatic source of light is used		1	CO1	3
3.	Discuss the formation of interference fringes due to a wedge shaped thin film seen by normally reflected sodium light and obtain the expression for bright and dark fringes.	10	1	CO1	3
	OR				
	Explain the formation of Newton's ring in reflected monochromatic light. Prove that in reflected light the diameter of bright fringes are proportional to the square root of odd natural numbers.		1	CO1	3

CT-II



Faculty of Engineering  
Second Internal Class Test  
B.Tech. (Computer Science & Engineering)

Year: I	Academic Year: 2018-19	Semester: I
Course Code: EAS112	Course Title: ENGINEERING PHYSICS	
Duration: 90 minutes	Max. Marks: 30	

*Attempt all questions.*

1.	Answer any five questions	Marks	Unit	CO	BTL
a.	Distinguish between Fraunhofer and Fresnel diffractions.	2	2	CO1	1
b.	What is meant by resolving power of an optical instrument?	2	2	CO1	2
c.	A plane transmission grating has 40,000 lines per inch. Determine its resolving power in the second order (n=2) for a wavelength of 5000 Å	2	2	CO1	2
d.	A light of wavelength 550 nm falls normally on a slit of width 2.2 μm. Determine the angular position of third minima.	2	2	CO1	1
e.	Define optic axis and principal section of a double refracting crystal.	2	3	CO1	1
f.	What are the difference between ordinary and extraordinary rays?	2	3	CO1	2



	c.	How can we increase the electrical conductivity in a semiconductor?	2	4	CO2	2
	d.	Define inertial and non inertial frame of reference.	2	5	CO3	1
	e.	Deduce the velocity at which the mass of particle becomes 1.25 times its rest mass ( $c=3 \times 10^8$ m/s)	2	5	CO4	2
	f.	What is the principal of twin paradox?	2	5	CO3	1
	g.	The length of a rod is found to be half its length when at rest. What is the speed of rod relative to the observer?	2	4	CO4	2
	h.	With what velocity should a rocket move so that every year spent on it corresponds to 4 years on earth?	2	5	CO4	2
2.		State and explain the theory of Hall effect, and also find out the relation for the Hall coefficient.	10	4	CO2	3
		OR				
		Explain Hall-effect in semiconductors? How Hall-effect is used to determine the nature of charge carriers in a semiconductor?		4	CO2	4
3.		State the fundamental postulate of the special theory of relativity and deduce from them the Lorentz transformation equations.	10	5	CO4	3
		OR				
		Deduce Einstein's mass energy relation $E=mc^2$ and discuss it.		5	CO4	3

29	TCA1809033	BHUPENDRA KUMAR	4	10	19
30	TCA1809034	NISHANT SINGH	4	14	13
31	TCA1809035	DRASHTI GUPTA	18	14	28
32	TCA1809036	KHUSHI CHHAIGHARIYA	15	AB	11
33	TCA1809037	PRAVESH KUMAR	26	AB	30
34	TCA1809038	SAMYAK JAIN	11	20	23
35	TCA1809039	UTSAV MUSKAN	14	AB	24
36	TCA1809040	RIYA JAIN	12	AB	24
37	TCA1809041	ANUBHAV JAIN	3	14	10
38	TCA1809042	VAIBHAV JAIN	10	AB	AB
39	TCA1809043	RAHUL JAIN	22	18	28
40	TCA1809044	KHUSHI JAIN	18	11	10
41	TCA1809045	ITIKA JAIN	14	15	16
42	TCA1809046	SHIVAM SAXENA	22	28	29
43	TCA1809047	AMAN JAIN	18	16	21
44	TCA1809048	AYUSHI JAIN	14	24	28
45	TCA1809049	ARBAAB KHAN	24	23	30
46	TCA1809050	SHASHANK JAIN	25	18	29
47	TCA1809051	PRACHI JAIN	15	AB	22
48	TCA1809052	SHRESHTH PRATAP MALL	22	AB	26
49	TCA1809053	TUSHAR KUMAR YADAV	AB	10	AB
50	TCA1809054	ASHISH KUMAR SINGH	11	AB	19
51	TCA1809055	SONIA JAIN	14	19	17
52	TCA1809056	AFREEN AYYOOB	15	A	28
53	TCA1809057	UDAY JAIN	16	AB	19
54	TCA1809058	YASH SINGH	11	19	26
55	TCA1809067	ARJUN SHARMA	5	AB	19
56	TCA1809068	ASHUTOSH KUMAR	13	13	23
57	TCA1809069	HARSH KUMAR SINGH	20	AB	19
58	TCA1809085	DEEPAK DIWAKAR	13	18	24
59	TCA1809087	ABDUL AHAD	9	22	27
60	TCA1809088	SHAQLAIN MUSTAQ	13	23	22



## 7. Identification of Slow Learners

Slow Learners After First CT				Criteria
1	TCA1809029	NISHANT TANWAR	4	CT1_Marks<30%
2	TCA1809033	BHUPENDRA KUMAR	1	
3	TCA1809034	NISHANT SINGH	4	
4	TCA1809041	ANUBHAV JAIN	4	
5	TCA1809067	ARJUN SHARMA	3	

Slow Learners After Second CT			Criteria
1	No students below 30 % after second CT	0	CT2_Marks<30%

## 8. Special classes with attendance sheet of slow learners with ATR after each CT

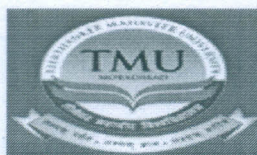
- Topics have been identified for slow learners after CT-1 as given below
  - Numericals on Fresnel Biprism
  - Working of Michelson Interferometer
- After special/remedial classes circular , classes had been taken as per below attendance sheet

Classes for Slow Learners After First CT			Date/Month			
S.NO.	Enrollment No.	Name	01/10	3/12	5/12	7/12
1	TCA1809029	NISHANT TANWAR		P	P	P
2	TCA1809033	BHUPENDRA KUMAR	P	P	P	
3	TCA1809034	NISHANT SINGH	P			P
4	TCA1809041	ANUBHAV JAIN		P	P	P
5	TCA1809067	ARJUN SHARMA	P	P	P	

- After Second CT-2, only one student was below criteria



10. Question Bank



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**FACULTY OF ENGINEERING**

Year: 1 <sup>st</sup>	Academic Year: 2018-19	Semester: I <sup>st</sup>
Course Code: EAS112 (Unit-I)	Course Name: Engineering Physics	

<b>Q1. Short answer type questions.</b>		<b>4*2=8</b>
<b>Unit 1:</b>		
Q. 1: What is Stoke's law for the phase change of reflection?		
Q. 2: Why does the centre of Newton's ring appear dark in reflected light?		
Q. 3: Why two independent sources can not be coherent?		
Q. 4: Why the Newton's rings are circular?		
<b>Q2. Medium answer type questions.</b>		<b>3*5=15</b>
Q. 1: Monochromatic light from a narrow slit illuminates two narrow slits 0.3 mm apart, producing an interference pattern with bright fringes 1.5 mm apart on a screen 75 cm away. Find the wavelength of light. How will the fringe width be altered if the distance of the screen is doubled?		
Q. 2: Explain the formation of colours when a thin film illuminated by with white light is observed in reflected light.		
Q. 3: When a slit is illuminated by light of wavelength 5893 A, was placed at a distance of 50 cm from a biprism, the separation between the fringes was found to be 0.012 cm on a screen at 100 cm from the biprism. Find the obtuse angle of the biprism.		
<b>Q3. Long answer type questions.</b>		<b>3*10=30</b>
Q. 1: Obtain an expression for fringe width in case of Young's double slit experiment. Prove that in this case of interference, dark and bright bands are of equal width.		
Q. 2: Describe and explain the formation of Newton's ring in reflected monochromatic light. Prove that in reflected light (i) diameter of bright fringes are proportional to the square root of odd natural numbers and (ii) the diameters of dark rings are proportional to the square root of natural numbers.		
Q. 3: Describe the construction and working of Michelson interferometer. How can it be used to determine the wavelength of monochromatic light?		



Year: 1 <sup>st</sup>	Academic Year: 2018-19	Semester: I <sup>st</sup>
Course Code: EAS112 (Unit-III)	Course Name: Engineering Physics	

<b>Q1. Short answer type questions.</b>		<b>4*2=8</b>
	<b>Unit 1:</b>	
	<b>Q. 1:</b> Define optic axis and principal section of a double refracting crystal.	
	<b>Q. 2:</b> Determine the Brewster's angle for a glass of refractive index 1.5 when it is immersed in water of refractive index 1.33.	
	<b>Q. 3:</b> What is optical activity? Discuss dextro-rotatory and leavo-rotatory substances?	
	<b>Q. 4:</b> What are ordinary and extraordinary rays?	
<b>Q2. Medium answer type questions.</b>		<b>3*5=15</b>
	<b>Q. 1:</b> What are ordinary and extraordinary rays?	
	<b>Q. 2:</b> Determine the Brewster's angle for a glass of refractive index 1.5 when it is immersed in water of refractive index 1.33.	
	<b>Q. 3:</b> Calculate the thickness of a quarter wave plate of quartz for sodium light of wavelength 5893 Å. The ordinary and extraordinary refractive indices for sodium are 1.544 and 1.553 respectively.	
<b>Q3. Long answer type questions.</b>		<b>3*10=30</b>
	<b>Q. 1:</b> What do you understand by double refraction? Explain how would you use this phenomenon in Nicol prism to produce a plane polarized light?	
	<b>Q. 2:</b> Define specific rotation. How can we determine the specific rotation of cane sugar solution using polarimeter? Explain.	
	<b>Q. 3:</b> What are phase retardation plates? How can a phase retardation plate be obtained from calcite crystal? Give the construction and theory of (i) quarter wave plate (ii) half wave plate. How would you distinguish between plane, circular and elliptically polarized light using phase retardation plates.	

Year: 1 <sup>rd</sup>	Academic Year: 2018-19	Semester: 1 <sup>st</sup>
Course Code: EAS112 (Unit-V)	Course Name: Engineering Physics	

<b>Q1. Short answer type questions.</b>		<b>4*2=8</b>
	<b>Unit 1:</b>	
	Q. 1: State the fundamental postulates of special theory of relativity.	
	Q. 2: What do you mean by inertial & non-inertial frame of reference.	
	Q. 3: Deduce the velocity at which the mass of particle becomes 1.25 times its rest mass ( $c=3*10^8$ m/s)	
	Q. 4: What is the mean life time of pi meson moving with speed $0.73c$ , when the proper life time is $2.5*10^{-8}$ second.	
<b>Q2. Medium answer type questions.</b>		<b>3*5=15</b>
	Q. 1: What do you mean by length contraction at relativistic speed? Discuss the necessary expression for it.	
	Q. 2: Deduce the relativistic velocity addition theorem. Show that it is consistent with Einstein's second postulate.	
	Q. 3: Show that space time interval, $x^2+y^2+z^2-c^2t^2$ is invariant under Lorentz transformation.	
<b>Q3. Long answer type questions.</b>		<b>3*10=30</b>
	Q. 1: Derive the Lorentz transformation equations for space and time coordinates.	
	Q. 2: What is time dilation? Discuss the possibility of time travel on the basis of the phenomenon time dilation. Is time dilation a real time phenomenon? Give experimental evidence for the same.	
	Q. 3: A body of rest mass $m_0$ is moving with a velocity $v$ relatively to the velocity of light. Will there be any effect on its mass? If yes, Obtain the formula for the variation of mass of body with its velocity.	



36	TCA1809040	RIYA JAIN		P			P	P	P	
37	TCA1809041	ANUBHAV JAIN	P	P	P	P			P	P
38	TCA1809042	VAIBHAV JAIN	P	P	P	P	P	P		
39	TCA1809043	RAHUL JAIN	P	P	P	P	P	P	P	P
40	TCA1809044	KHUSHI JAIN	P		P		P	P	P	P
41	TCA1809045	ITIKA JAIN	P	P	P	P	P	P	P	P
42	TCA1809046	SHIVAM SAXENA	P	P		P	P	P		P
43	TCA1809047	AMAN JAIN	P	P	P	P	P	P	P	P
44	TCA1809048	AYUSHI JAIN	P	P	P	P	P	P	P	P
45	TCA1809049	ARBAAB KHAN	P	P	P	P	P	P	P	P
46	TCA1809050	SHASHANK JAIN	P	P	P	P	P	P	P	P
47	TCA1809051	PRACHI JAIN	P	P	P	P	P	P	P	P
48	TCA1809052	SHRESHTH PRATAP MALL	P		P	P	P	P	P	P
49	TCA1809053	TUSHAR KUMAR YADAV	P	P	P	P	P		P	P
50	TCA1809054	ASHISH KUMAR SINGH	P	P	P	P	P	P	P	P
51	TCA1809055	SONIA JAIN	P	P			P	P	P	
52	TCA1809056	AFREEN AYYOOB	P	P	P		P		P	
53	TCA1809057	UDAY JAIN	P	P				P		P
54	TCA1809058	YASH SINGH	P	P		P	P	P	P	P
55	TCA1809067	ARJUN SHARMA	P	P	P	P	P	P	P	P
56	TCA1809068	ASHUTOSH KUMAR	P	P	P	P	P	P	P	
57	TCA1809069	HARSH KUMAR SINGH	P	P	P		P	P	P	
58	TCA1809085	DEEPAK DIWAKAR	P	P			P	P	P	
59	TCA1809087	ABDUL AHAD	P	P	P	P	P	P		
60	TCA1809088	SHAQLAIN MUSTAQ	P	P	P	P	P	P	P	P



35	TCA1809039	UTSAV MUSKAN	P	P	P	P	P	P	P	P	P	P	P
36	TCA1809040	RIYA JAIN		P			P	P	P			P	P
37	TCA1809041	ANUBHAV JAIN	P	P	P	P			P	P	P		
38	TCA1809042	VAIBHAV JAIN	P	P	P	P	P	P			P	P	P
39	TCA1809043	RAHUL JAIN	P	P	P	P	P	P	P	P	P	P	P
40	TCA1809044	KHUSHI JAIN	P		P		P	P	P	P		P	P
41	TCA1809045	ITIKA JAIN	P	P	P	P	P	P	P	P	P	P	P
42	TCA1809046	SHIVAM SAXENA	P	P		P	P	P		P	P	P	P
43	TCA1809047	AMAN JAIN	P	P	P	P	P	P	P	P	P	P	P
44	TCA1809048	AYUSHI JAIN	P	P	P	P	P	P	P	P	P	P	P
45	TCA1809049	ARBAAB KHAN	P	P	P	P	P	P	P	P	P	P	P
46	TCA1809050	SHASHANK JAIN	P	P	P	P	P	P	P	P	P	P	P
47	TCA1809051	PRACHI JAIN	P	P	P	P	P	P	P	P	P	P	P
48	TCA1809052	SHRESHTH PRATAP MALL	P		P	P	P	P	P	P	P	P	P
49	TCA1809053	TUSHAR KUMAR YADAV	P	P	P	P	P		P	P	P	P	
50	TCA1809054	ASHISH KUMAR SINGH	P	P	P	P	P	P	P	P	P	P	P
51	TCA1809055	SONIA JAIN	P	P			P	P	P			P	P
52	TCA1809056	AFREEN AYYOOB	P	P	P		P		P			P	
53	TCA1809057	UDAY JAIN	P	P				P		P			P
54	TCA1809058	YASH SINGH	P	P		P	P	P	P	P	P	P	P
55	TCA1809067	ARJUN SHARMA	P	P	P	P	P	P	P	P	P	P	P
56	TCA1809068	ASHUTOSH KUMAR	P	P	P	P	P	P	P		P	P	P
57	TCA1809069	HARSH KUMAR SINGH	P	P		P	P	P	P	P	P	P	P
58	TCA1809085	DEEPAK DIWAKAR	P	P	P	P	P	P	P	P	P	P	P
59	TCA1809087	ABDUL AHAD	P	P	P	P	P	P	P		P	P	P
60	TCA1809088	SHAQLAIN MUSTAQ	P	P		P	P	P	P	P	P	P	P



37	TCA1809041	ANUBHAV JAIN	P	P	P	P			P	P	P
38	TCA1809042	VAIBHAV JAIN	P	P	P	P	P	P			P
39	TCA1809043	RAHUL JAIN	P	P	P	P	P	P	P	P	P
40	TCA1809044	KHUSHI JAIN	P		P		P	P	P	P	
41	TCA1809045	ITIKA JAIN	P	P	P	P	P	P	P	P	P
42	TCA1809046	SHIVAM SAXENA	P	P		P	P	P		P	P
43	TCA1809047	AMAN JAIN	P	P	P	P	P	P	P	P	P
44	TCA1809048	AYUSHI JAIN	P	P	P	P	P	P	P	P	P
45	TCA1809049	ARBAAB KHAN	P	P	P	P	P	P	P	P	P
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48	TCA1809052	SHRESHTH PRATAP MALL	P		P	P	P	P	P	P	P
49	TCA1809053	TUSHAR KUMAR YADAV	P	P	P	P	P		P	P	P
50	TCA1809054	ASHISH KUMAR SINGH	P	P	P	P	P	P	P	P	P
51	TCA1809055	SONIA JAIN	P	P			P	P	P		
52	TCA1809056	AFREEN AYYOOB	P	P	P		P		P		
53	TCA1809057	UDAY JAIN	P	P				P		P	
54	TCA1809058	YASH SINGH	P	P		P	P	P	P	P	P
55	TCA1809067	ARJUN SHARMA	P	P	P	P	P	P	P	P	P
56	TCA1809068	ASHUTOSH KUMAR	P	P	P	P	P	P	P		P
57	TCA1809069	HARSH KUMAR SINGH	P	P		P	P	P	P	P	P
58	TCA1809085	DEEPAK DIWAKAR	P	P	P	P	P	P	P	P	P
59	TCA1809087	ABDUL AHAD	P	P	P	P	P	P	P		P
60	TCA1809088	SHAQLAIN MUSTAQ	P	P		P	P	P	P	P	P











32	TCA1809036	KHUSHI CHHAIGHARIYA	P	P	P
33	TCA1809037	PRAVESH KUMAR	P	P	P
34	TCA1809038	SAMYAK JAIN	P	P	P
35	TCA1809039	UTSAV MUSKAN	P	P	P
36	TCA1809040	RIYA JAIN		P	
37	TCA1809041	ANUBHAV JAIN	P	P	P
38	TCA1809042	VAIBHAV JAIN	P	P	P
39	TCA1809043	RAHUL JAIN	P	P	P
40	TCA1809044	KHUSHI JAIN	P		P
41	TCA1809045	ITIKA JAIN	P	P	P
42	TCA1809046	SHIVAM SAXENA	P	P	
43	TCA1809047	AMAN JAIN	P	P	P
44	TCA1809048	AYUSHI JAIN	P	P	P
45	TCA1809049	ARBAAB KHAN	P	P	P
46	TCA1809050	SHASHANK JAIN	P	P	P
47	TCA1809051	PRACHI JAIN	P	P	P
48	TCA1809052	SHRESHTH PRATAP MALL	P		P
49	TCA1809053	TUSHAR KUMAR YADAV	P	P	P
50	TCA1809054	ASHISH KUMAR SINGH	P	P	P
51	TCA1809055	SONIA JAIN	P	P	
52	TCA1809056	AFREEN AYYOOB	P	P	P
53	TCA1809057	UDAY JAIN	P	P	
54	TCA1809058	YASH SINGH	P	P	
55	TCA1809067	ARJUN SHARMA	P	P	P
56	TCA1809068	ASHUTOSH KUMAR	P	P	P
57	TCA1809069	HARSH KUMAR SINGH	P	P	
58	TCA1809085	DEEPAK DIWAKAR	P	P	P
59	TCA1809087	ABDUL AHAD	P	P	P
60	TCA1809088	SHAQLAIN MUSTAQ	P	P	



[https://drive.google.com/file/d/10a6vzUNQEXG\\_3U49t6Pnu0-aILX3idpJ/view?usp=sharing](https://drive.google.com/file/d/10a6vzUNQEXG_3U49t6Pnu0-aILX3idpJ/view?usp=sharing) [Unit 5 hand notes]

<https://docs.google.com/presentation/d/1S6gHFgsm1aU5x4ZD8hnNFJnhl0iWhT8z/edit?usp=sharing&oid=109829471321384196152&rtpof=true&sd=true> [Unit 5 ppt]

Sl.N o.	Enrollment No.	Name	EAS112																				
			Max. Marks															Total					
			10	10	10	10	40	6	6	6	8	12	60	12	12	12	12	12	18	20	18	20	24
			CT1	CT2	CT3	Asn	I	CO1	CO2	CO3	CO4	CO5	E	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5
1	TCA1809006	ISHU SETHIA	10	9	AB	10	38	6.0	8.0	5.6	7.4	2.0	33	6.6	6.6	6.6	6.6	6.6	13	15	12	14	9
2	TCA1809008	SIDDHARTH JAIN	8	10	AB	10	37	5.2	6.8	6.0	8.0	2	43	8.6	8.6	8.6	8.6	8.6	14	15	15	17	11
3	TCA1809009	VARTIKA JAIN	5	AB	9	10	33	4.0	5.0	2.0	2.0	11	31	6.2	6.2	6.2	6.2	6.2	10	11	8	8	17
4	TCA1809010	DANISH PASHA	9	5	10	10	37	5.6	7.4	4.0	5.0	12	34	6.8	6.8	6.8	6.8	6.8	12	14	11	12	19
5	TCA1809011	ARIHANT JAIN	3	AB	1	7	19	2.6	3.2	1.4	1.4	2.4	35	7	7	7	7	7	10	10	8	8	9
6	TCA1809013	PALAK JAIN	4	3	9	10	32	3.6	4.4	3.2	3.8	11	31	6.2	6.2	6.2	6.2	6.2	10	11	9	10	17
7	TCA1809014	SHREYANS LODHA	10	10	AB	10	40	6.0	8.0	6.0	8.0	2	38	7.6	7.6	7.6	7.6	7.6	14	16	14	16	10
8	TCA1809015	ARCHIT JAIN	4	4	9	9	30	3.4	4.2	3.4	4.2	11	20	4	4	4	4	4	7	8	7	8	15
9	TCA1809016	MOHIT MUDGAL	6	3	5	10	30	4.4	5.6	3.2	3.8	7	22	4.4	4.4	4.4	4.4	4.4	9	10	8	8	11
10	TCA1809017	RITIKA JAIN	8	8	10	10	37	5.2	6.8	5.2	6.8	12	36	7.2	7.2	7.2	7.2	7.2	12	14	12	14	19
11	TCA1809018	HARDIK JAIN	8	5	7	10	33	5.2	6.8	4.0	5.0	9	31	6.2	6.2	6.2	6.2	6.2	11	13	10	11	15
12	TCA1809020	ANIKA JAIN	5	4	9	10	32	4.0	5.0	3.6	4.4	11	23	4.6	4.6	4.6	4.6	4.6	9	10	8	9	16
13	TCA1809021	VANSHIKA JAIN	7	7	7	10	33	4.8	6.2	4.8	6.2	9	36	7.2	7.2	7.2	7.2	7.2	12	13	12	13	16
14	TCA1809022	ISHIKA JAIN	8	7	9	10	36	5.2	6.8	4.8	6.2	11	39	7.8	7.8	7.8	7.8	7.8	13	15	13	14	19
15	TCA1809023	AMAN MADHOK	10	AB	9	10	37	6.0	8.0	2.0	2.0	11	31	6.2	6.2	6.2	6.2	6.2	12	14	8	8	17
16	TCA1809026	UTTKARSH PARMAR	10	9	10	10	39	6.0	8.0	5.6	7.4	12	36	7.2	7.2	7.2	7.2	7.2	13	15	13	15	19
17	TCA1809028	DHAIRYA CHAUHAN	4	5	4	9	27	3.4	4.2	3.8	4.8	5.8	22	4.4	4.4	4.4	4.4	4.4	8	9	8	9	10
18	TCA1809030	RAVINSHU JAIN	5	3	8	10	31	4.0	5.0	3.2	3.8	10	18	3.6	3.6	3.6	3.6	3.6	6	7	6	7	13
19	TCA1809031	YASH JAIN	4	3	8	9	31	3.4	4.2	3.0	3.6	9.8	15	3	3	3	3	3	6	7	6	7	13
20	TCA1809032	HEMANT JAIN	2	3	4	10	26	2.8	3.2	3.2	3.8	6	24	4.8	4.8	4.8	4.8	4.8	8	8	8	9	11
21	TCA1809035	DRASHTI GUPTA	8	8	7	10	36	5.2	6.8	5.2	6.8	9	32	6.4	6.4	6.4	6.4	6.4	12	13	12	13	15
22	TCA1809036	KHUSHI CHHAIGHARIYA	8	6	9	10	35	5.2	6.8	4.4	5.6	11	30	6	6	6	6	6	11	13	10	12	17
23	TCA1809038	SAMYAK JAIN	4	3	6	10	28	3.6	4.4	3.2	3.8	8	25	5	5	5	5	5	9	9	8	9	13
24	TCA1809040	RIYA JAIN	10	10	AB	10	39	6.0	8.0	6.0	8.0	2	41	8.2	8.2	8.2	8.2	8.2	14	16	14	16	10
25	TCA1809042	VAIBHAV JAIN	10	10	1	10	40	6.0	8.0	6.0	8.0	3	44	8.8	8.8	8.8	8.8	8.8	15	17	15	17	12
26	TCA1809043	RAHUL JAIN	10	9	AB	10	38	6.0	8.0	5.6	7.4	2	35	7	7	7	7	7	13	15	13	14	9
27	TCA1809044	KHUSHI JAIN	9	9	2	10	36	5.6	7.4	5.6	7.4	4	38	7.6	7.6	7.6	7.6	7.6	13	15	13	15	12
28	TCA1809045	ITIKA JAIN	10	9	7	10	38	6.0	8.0	5.6	7.4	9	37	7.4	7.4	7.4	7.4	7.4	13	15	13	15	16
29	TCA1809048	AYUSHI JAIN	3	5	9	10	34	3.2	3.8	4.0	5.0	11	34	6.8	6.8	6.8	6.8	6.8	10	11	11	12	18
30	TCA1809049	ARBAAB KHAN	7	9	9	10	37	4.8	6.2	5.6	7.4	11	42	7.4	7.4	7.4	7.4	7.4	12	14	13	15	18
31	TCA1809050	SHASHANK JAIN	7	10	10	10	39	4.8	6.2	6.0	8.0	12	29	7.8	7.8	7.8	7.8	7.8	13	14	14	16	20
32	TCA1809051	PRACHI JAIN	9	9	AB	10	36	5.6	7.4	5.6	7.4	2	30	7.2	7.2	7.2	7.2	7.2	13	15	13	15	9
33	TCA1809056	AFREEN AYYOOB	7	6	10	10	36	4.8	6.2	4.4	5.6	12	27	7.2	7.2	7.2	7.2	7.2	12	13	12	13	19
34	TCA1809057	UDAY JAIN	7	8	AB	10	34	4.8	6.2	5.2	6.8	2	49	6.8	6.8	6.8	6.8	6.8	12	13	12	14	9
35	TCA1809067	ARJUN SHARMA	4	5	3	10	28	3.6	4.4	4.0	5.0	5	22	4.4	4.4	4.4	4.4	4.4	8	9	8	9	9

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Sl.N o.	Enrollment No.	Name	EAS112																					
			Max. Marks															Total						
			10	10	10	10	40	6	8	6	8	12	60	12	12	12	12	12	18	20	18	20	24	
CT1	CT2	CT3	Asn	I	CO1	CO2	CO3	CO4	CO5	E	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5				
36	TCA1809068	ASHUTOSH KUMAR	5	5	3	9	28	3.8	4.8	3.8	4.8	4.8	27	5.4	5.4	5.4	5.4	5.4	9	10	9	10	10	
37	TCA1809069	HARSH KUMAR SINGH	7	7	10	9	34	4.6	6.0	4.6	6.0	12	44	8.8	8.8	8.8	8.8	8.8	13	15	13	15	21	
38	TCA1809087	ABDUL AHAD	6	7	AB	10	23	4.4	5.6	4.8	6.2	2	28	5.6	5.6	5.6	5.6	5.6	10	11	10	12	8	
39	TCA1809007	GAURAV MISHRA	5	4	4	10	29	4.0	5.0	3.6	4.4	6	20	4	4	4	4	4	8	9	8	8	10	
40	TCA1809012	ANJLI	8	7	5	10	27	5.2	6.8	4.8	6.2	7	25	5	5	5	5	5	10	12	10	11	12	
41	TCA1809024	HARSHIT JAIN	3	1	5	9	27	3.0	3.6	2.2	2.4	6.8	24	4.8	4.8	4.8	4.8	4.8	8	8	7	7	12	
42	TCA1809027	SHASHWAT KESHAV	3	AB	7	10	29	3.2	3.8	2.0	2.0	9	26	5.2	5.2	5.2	5.2	5.2	8	9	7	7	14	
43	TCA1809034	NISHANT SINGH	AB	4	6	7	30	1.4	1.4	3.0	3.8	7.4	19	3.8	3.8	3.8	3.8	3.8	5	5	7	8	11	
44	TCA1809039	UTSAV MUSKAN	5	1	2	10	26	4.0	5.0	2.4	2.6	4	18	3.6	3.6	3.6	3.6	3.6	8	9	6	6	8	
45	TCA1809041	ANUBHAV JAIN	1	3	5	10	27	2.4	2.6	3.2	3.8	7	27	5.4	5.4	5.4	5.4	5.4	8	8	9	9	12	
46	TCA1809046	SHIVAM SAXENA	5	5	6	10	29	4.0	5.0	4.0	5.0	8	27	5.4	5.4	5.4	5.4	5.4	9	10	9	10	13	
47	TCA1809047	AMAN JAIN	3	1	2	10	25	3.2	3.8	2.4	2.6	4	25	5	5	5	5	5	8	9	7	8	9	
48	TCA1809053	TUSHAR KUMAR YADAV	6	4	8	10	33	4.4	5.6	3.6	4.4	10	23	4.6	4.6	4.6	4.6	4.6	9	10	8	9	15	
49	TCA1809054	ASHISH KUMAR SINGH	5	4	6	10	29	4.0	5.0	3.6	4.4	8	23	4.6	4.6	4.6	4.6	4.6	9	10	8	9	13	
50	TCA1809055	SONIA JAIN	8	AB	8	10	34	5.2	6.8	2.0	2.0	10	17	3.4	3.4	3.4	3.4	3.4	9	10	5	5	13	
51	TCA1809058	YASH SINGH	2	AB	9	10	29	2.8	3.2	2.0	2.0	11	23	4.6	4.6	4.6	4.6	4.6	7	8	7	7	16	
52	TCA1809004	UWAIK IKRAM	3	1	2	7	20	2.6	3.2	1.8	2.0	3.4	32	6.4	6.4	6.4	6.4	6.4	9	10	8	8	10	
53	TCA1809019	ARCHIT JAIN	3	2	5	8	21	2.8	3.4	2.4	2.8	6.6	26	5.2	5.2	5.2	5.2	5.2	8	9	8	8	12	
54	TCA1809025	RUPIT BHATNAGAR	1	1	AB	10	21	2.4	2.6	2.4	2.6	2	19	3.8	3.8	3.8	3.8	3.8	6	6	6	6	6	
55	TCA1809029	NISHANT TANWAR	AB	3	2	7	25	1.4	1.4	2.6	3.2	3.4	20	4	4	4	4	4	5	5	7	7	7	
56	TCA1809033	BHUPENDRA KUMAR	4	5	7	8	21	3.2	4.0	3.6	4.6	8.6	25	5	5	5	5	5	8	9	9	10	14	
57	TCA1809037	PRAVESH KUMAR	5	6	6	9	25	3.8	4.8	4.2	5.4	7.8	25	5	5	5	5	5	9	10	9	10	13	
58	TCA1809052	SHRESHTH PRATAP MALL	AB	0	0	10	18	2.0	2.0	2.0	2.0	2	18	3.6	3.6	3.6	3.6	3.6	6	6	6	6	6	
59	TCA1809085	DEEPAK DIWAKAR	0	1	0	10	20	2.0	2.0	2.4	2.6	2	1	0.2	0.2	0.2	0.2	0.2	2	2	3	3	2	
60	TCA1809088	SHAQLAIN MUSTAQ	AB	AB	1	8	17	1.6	1.6	1.6	1.6	2.6	04	0.8	0.8	0.8	0.8	0.8	2	2	2	2	3	

Total CO Marks

Target >45  
No of Students have >Target

18	20	18	20	24
CO1	CO2	CO3	CO4	CO5
8	9	8	9	11
42	39	41	33	38

  
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**Benchmark and Attainment**

Others of Students get more than target			1
50% of Students get more than target			2
70% of Students get more than target			3

**Students Above Threshold**

	Cos	Students	%	Att.
	CO1	42	70	3
	CO2	39	65	2
	CO3	41	68.33	2
	CO4	33	55	2
	CO5	38	63.33	2

2.2

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 1	PO 2	PO 3	PS 03
EAS112CO1	1	2	1									2	1	2	
EAS112CO2	1	2	1												
EAS112CO3	1	2	1												
EAS112CO4	2	2	2												
EAS112CO5	2	2	2												
Average	1.4	2	1.4												
Course Attainment	1.0	1.5	1.0												

  
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