

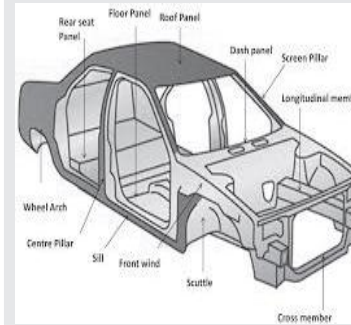
19AE201 AUTOMOTIVE CHASSIS

Hours Per Week :

L	T	P	C
3	-	2	4

Total Hours :

L	T	P	CS	WA/RA	SSH	SA	S	BS
45	-	30	5	5	30	20	5	5



Source :
<https2.bp.blogspot.com-png>

COURSE DESCRIPTION AND OBJECTIVES :

This course aims at offering the fundamental concepts of different types of chassis frame construction and to gain knowledge about different types of steering geometry and front axle. The objective of this course is to offer knowledge on various components of an automobile chassis such as axles, frames, braking system and suspension systems. In addition, this course will enable the student to learn the concepts of an automobile chassis construction.

COURSE OUTCOMES:

Upon completion of the course, the students will be able to achieve the following outcomes :

COs	Course Outcomes	POs
1	Understand the different types of systems in automobile like chassis, steering, drive line, braking and suspension systems	10
2	Apply the knowledge to understand the real life problems encountered in various systems of automobile	1,10,12
3	Analyze the performance parameters of various systems of automobile	2,9,10
4	Evaluate the performance of the various systems of automobile under different conditions.	4,9,10

SKILLS:

- ✓ Study, Analyze and test the frames.
- ✓ Choose and design an axles according to requirement
- ✓ Identify various steering systems
- ✓ Select a proper test type for brakes from various methods.
- ✓ Identify different suspension systems in an automobile

UNIT - I	L-9
PARTIAL DIFFERENTIAL EQUATIONS	
Elimination of one and two arbitrary function, Formation of partial differential equations; Higher order linear partial differential equations with constant coefficients; application of partial differential equations (one dimensional wave and heat flow equations, Laplace Equation.	
Unit - II	L-9
SERIES SOLUTION TECHNIQUES	
Bessel's differential equation and its solution; Legendre's differential equation and its solution.	
Unit - III	L-9
FUNCTIONS OF A COMPLEX VARIABLE	
Limit, continuity and analytic function, Cauchy-Riemann equations; Harmonic functions, construction of harmonic conjugate.	
Unit - IV	L-9
LAPLACE TRANSFORMATION	
Laplace transformation and its applications to the solutions of ordinary and simultaneous differential equations.	
Unit - V	L-9
TESTING OF HYPOTHESIS	
Level of Significance-Degrees of freedom-Statistical errors, Large sample test (Z-test), Small sample test t-test (One tailed, two tailed and Paired tests), (ONLY MEANS) Testing of Significance through variance (F-test), Chi-Square test, contingency table.	
CORRELATION	
Correlation, Spearman's rank correlation.	
REGRESSION	
Scattering diagram, regression, regression lines.	

TEXT BOOKS:

1. H. K. Dass and Er. Rajanish Verma, "Higher Engineering Mathematics", S. Chand & Co., 3rd edition, 2015.
2. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 44th edition, 2018.

REFERENCE BOOKS:

1. John Bird, "Higher Engineering Mathematics", Routledge (Taylor & Francis Group), London, New York, 2018.
2. Srimanta Pal and Subodh C. Bhunia, "Engineering Mathematics", Oxford Publications, 2015.
3. B. V. Ramana, "Advanced Engineering Mathematics", TMH Publishers, 3rd edition, 2008.
4. N. P. Bali and K. L. Sai Prasad, "A Textbook of Engineering Mathematics I, II, III", Universal Science Press, New Delhi, 2018.
5. T. K. V. Iyengar et al., "Engineering Mathematics, I, II, III", S. Chand & Co., New Delhi, 2018.
6. Narayan Shanti, "Differential Calculus". S. Chand and Co. Ltd. New Delhi, 2004.
7. Narayan Shanti, "Integral Calculus". S. Chand and Co. Ltd. New Delhi, 2004.
8. Narayan Shanti, "A Text Book of Vector Calculus". S. Chand and Co. Ltd. New Delhi, 2004.

TUTORIAL

1. Partial differential equations.
2. Applications of partial differential equations.
3. Series solutions of differential equations.
4. Bessel's differential equations.
5. Legendre's differential equations.
6. Analytical functions, Cauchy-Riemann equations.
7. Harmonic functions.
8. Laplace Transformation.
9. Inverse Laplace transformations.
10. Application of Laplace transformations to solutions of ordinary.
11. Problems on One Sample, Two sample Z-tests when Population S.D. is known.
12. Problems on One Sample, Two sample Z-tests when Population S.D. is unknown.
13. Problems on one sample using t-test.
14. Problems on two sample and paired t-test.
15. Contingency Table and Chi-Square test – 2×2 and $m \times n$.
16. F-test.
17. Calculation of Correlation coefficient and its testing.