

**K L UNIVERSITY**  
**COURSE BEAR UP FOR B.TECH PROGRAM W.E.F. 2013-14 ADMITTED BATCH**

**DEPARTMENT OF MECHANICAL ENGINEERING**

**TOTAL CREDITS : 170**

The Department of Mechanical Engineering, offers the following Options for B.Tech.:

a) B.Tech. in Mechanical Engineering

b) B.Tech. in Mechanical Engineering with Specialization in ( Any one of the following):

1. Automobile Engineering
2. Aerospace Engineering
3. Flexible Manufacturing Systems
4. Mechatronics

A student can opt any one of the above, however if a student opts for B.Tech. in Mechanical Engineering, the choice of Elective Courses must be restricted to the List of General Elective Courses offered by the Department under its various Groups vis-à-vis; Thermal Engineering, Design Engineering, Manufacturing Engineering, Robotics & Mechatronics, Industrial Engineering. These category of students have to choose their electives such that they take at least one elective from each group during their entire course work.

A Student opting for Specialization degree, in any one of the specializations listed above, must have to choose the electives as listed under the Specific Specialization Electives Categories for their choice of Specialization. However the Specialization degree will be offered, if and only if the such students also take up their Practice School / Final Year Project, to be falling in the respective domains of their choice of Specialization only.

S.No	Course Code	Course Title	Offered in Even/ Odd Sem.	L-T-P	Credits	Pre-requisite	Compulsory / Option
<b>HUMANITIES AND SOCIAL SCIENCES (HS) - CREDITS – 10 (except for Bio Tech), 8 (for Bio Tech only)</b>							
1.	13-HS 101	English	<b>Even &amp; Odd</b>	2-0-2	3	Nil*	Compulsory
2.	13-HS 102	Language and Reasoning Skills	<b>Even &amp; Odd</b>	2-0-2	3	Nil*	Compulsory

3.	11-BS 105	Ecology & Environment	<b>Even &amp; Odd</b>	2-0-0	2	Nil*	Compulsory( Except for Bio Technology)
4.	13-HS 104	Human Values	<b>Even &amp; Odd</b>	2-0-0	2	Nil*	Compulsory
<b>BASIC SCIENCES (BS) - CREDITS – 22 ( except for Bio Tech), 24 ( only for Bio Tech)</b>							
1.	13-BS 101	Linier Algebra & Multi Variant Calculus	<b>Even &amp; Odd</b>	3-1-0	4	Nil*	Compulsory
2.	13-BS 102	Differential Equations	<b>Even &amp; Odd</b>	3-0-2	4	Nil*	Compulsory
3.	13-BS 103	Engineering Physics	<b>Even &amp; Odd</b>	3-0-2	4	Nil*	Compulsory
4.	11-BS 104	Engineering Chemistry	<b>Even &amp; Odd</b>	3-0-2	4	Nil*	Compulsory
5.	13-BS-110	Mathematical Models	<b>Even &amp; Odd</b>	3-0-0	3	13-BS 101&102	Compulsory (Except for Bio Tech)
6.	13-BS-111	Complex Variable & Discrete Mathematics	<b>Even &amp; Odd</b>	3-0-0	3	13-BS 101&102	Compulsory (Except for Bio Tech)
7.	13-BS-107	Organic Chemistry	<b>Even &amp; Odd</b>	2-0-0	2	Nil*	Compulsory (only for Bio Tech)
8.	13-BS-108	Biology-I	<b>Even &amp; Odd</b>	3-0-0	3	Nil*	Compulsory (only for Bio Tech)
9.	13-BS-109	Biology-II	<b>Even &amp; Odd</b>	3-0-0	3	Nil*	Compulsory (only for Bio Tech)
<b>ENGINEERING SCIENCES (ES) – CREDITS – 37</b>							
1.	13-ES 103	Engineering Materials ( to be dealt jointly by faculty from Physics, Electrical and Electronics, Mech.Engg.)	<b>Even &amp; Odd</b>	3-0-0	3	Nil*	Compulsory
2.	13-ES 102	Engineering Measurements ( to be dealt Jointly by faculty with ECE, EEE and Mech. Engg. background)	<b>Even &amp; Odd</b>	3-0-2	4	Nil*	Compulsory
3.	11-ES 104	Engineering Graphics with CAD ( to be dealt by faculty with Mech. Engg. background)	<b>Even &amp; Odd</b>	0-0-4	2	Nil*	Compulsory
4.	13-ES 105	Workshop Practice (to be dealt by faculty with Mech.Engg. background)	<b>Even &amp; Odd</b>	0-0-4	2	Nil*	Compulsory
5.	13-ES 101	Problem Solving through Programming	<b>Even &amp; Odd</b>	3-0-2	4	Nil*	Compulsory

		(to be dealt by faculty with Computer Science & Engg. background)					
6.	13-ES 106	Engineering Mechanics (to be dealt by faculty with Mech. Engg. background)	<b>Even &amp; Odd</b>	3-0-2	4	Nil*	Compulsory
7.	13-ES 201	Engineering Thermodynamics (to be dealt by faculty with Mech. Engg. background)	<b>Even &amp; Odd</b>	3-0-0	3	13-BS103	Compulsory
8.	13-ES 202	Object Oriented Programming {OOPS} (to be dealt by faculty with Computer Science & Engg. background)	<b>Even &amp; Odd</b>	3-0-2	4	13-ES101	Compulsory
9.	13-ES 203	Network Theory (to be dealt by faculty with Electrical and Electronics & Engg. background)	<b>Even &amp; Odd</b>	3-1-0	4	13-BS102	Compulsory
10.	13-ES 204	Data Structures (to be dealt by faculty with Computer Science & Engg. background)	<b>Even &amp; Odd</b>	3-0-2	4	13-ES101	Compulsory
11.	13-ES 205	Digital Signal Processing (to be dealt by faculty with Electronics and Communications Engg. background)	<b>Even &amp; Odd</b>	3-0-2	4	13-BS102	Compulsory

**\* All the courses are prerequisites for choosing any course from the third semester onwards**

<b>DEPARTMENT PROFESSIONAL CORE COURSES</b>							
1.	13-ME 201	Fluid Mechanics & Hydraulic Machines	Odd	3-0-2	4	13-ES 107	Compulsory
2.	13-ME 202	Applied Thermodynamics	Even	3-0-2	4	13-ES 107	Compulsory
3.	13-ME 301	I C Engines & Gas Turbines	Odd	3-0-2	4	13-ES 107	Compulsory
4.	13-ME 401	Heat Transfer	Odd	3-0-2	4	13-ME 102	Compulsory
5.	13-ME 203	Metallurgy	Odd	3-0-2	4	13-ES 107	Compulsory
6.	13-ME 204	Manufacturing Processes	Even	3-0-2	4	13-ES 103	Compulsory
7.	13-ME 302	Machine Tool Engineering	Odd	3-0-2	4	11-ES 105	Compulsory
8.	13-ME 303	Operations Research	Even	3-0-2	4	13-PC 106	Compulsory
9.	13-ME 304	Metrology and Instrumentation	Odd	3-0-2	4	13-BS 101, 13 BS 102	Compulsory
10.	13-ME 205	Strength of Materials	Odd	3-0-2	4	13-ES 106,107	Compulsory
11.	13-ME 206	Mechanisms and Machine theory	Even	3-0-2	4	13-ES 106	Compulsory
12.	13-ME 305	Finite Element Methods	Odd	3-0-2	4	13-ES 106	Compulsory
13.	13-ME 306	Mechanical Engineering Design	Even	3-0-2	4	13-ME 110	Compulsory
14.	13-ME 402	Machine Design	Odd	3-0-2	4	13-ME 110	Compulsory
15.	13-ME 403	Industrial Engineering Techniques	Odd	3-0-2	4	13-ME 113	Compulsory

<b>DEPARTMENT GENERAL ELECTIVES OFFERED BY THERMAL ENGINEERING GROUP</b>							
1.	13-ME 331	R & AC	Even & Odd	3-0-0	3	13-ME 102	General electives
2.	13-ME 332	Alternative Energies	Even & Odd	3-0-0	3	13-ES 107	
3.	13-ME 333	Energy Management	Even & Odd	3-0-0	3	13-ES 107	
4.	13-ME 334	Power Plant Engineering	Even & Odd	3-0-0	3	13-ME102	
<b>DEPARTMENT GENERAL ELECTIVES OFFERED BY DESIGN ENGINEERING GROUP</b>							
1.	13-ME 341	Advanced Mechanics of Solids	Even & Odd	3-0-0	3	13-ME 110	General electives
2.	13-ME 342	Theory of Elasticity & Plasticity	Even & Odd	3-0-0	3	13-ME 110	
3.	13-ME 343	Human Factors in Engineering Design	Even & Odd	3-0-0	3	13-ME 113	
4.	13-ME 344	Vibrations Engineering	Even & Odd	3-0-0	3	13-ME 113	
<b>DEPARTMENT GENERAL ELECTIVES OFFERED BY ROBOTICS &amp; MECHATRONICS GROUP</b>							
1.	13-ME 351	Robotics: Sensing and Control	Even & Odd	3-0-0	3	13-ME 109	General electives
2.	13-ME 352	Mechatronics Product Design	Even & Odd	3-0-0	3	13-ME 113	
3.	13-ME 353	Industrial Automation	Even & Odd	3-0-0	3	13-ME109	
4.	13-ME 354	Intelligent Visual Surveillance	Even & Odd	3-0-0	3	13-ME 109	

<b>DEPARTMENT GENERAL ELECTIVES OFFERED BY MANUFACTURING ENGINEERING GROUP</b>							General electives
1.	13-ME 361	Reverse Engineering & Rapid Prototyping	<b>Even &amp; Odd</b>	3-0-0	3	13-ME 106	
2.	13-ME 362	Powder Metallurgy	<b>Even &amp; Odd</b>	3-0-0	3	13-ME 105	
3.	13-ME 363	Non-Destructive Testing	<b>Even &amp; Odd</b>	3-0-0	3	13-ME 109	
4.	13-ME 364	Concurrent Engineering	<b>Even &amp; Odd</b>	3-0-0	3	13-ME 107	
<b>DEPARTMENT GENERAL ELECTIVES OFFERED BY INDUSTRIAL ENGINEERING GROUP</b>							General electives
1.	13-ME 371	Facility layout & Material Handling	<b>Even &amp; Odd</b>	3-0-0	3	13-ME 115	
2.	13-ME 372	Work Study & Ergonomics	<b>Even &amp; Odd</b>	3-0-0	3	13-ME 115	
3.	13-ME 373	Total Quality Management	<b>Even &amp; Odd</b>	3-0-0	3	13-ME 115	
4.	13-ME 374	Operations Management	<b>Even &amp; Odd</b>	3-0-0	3	13-ME 115	
<b>MANAGEMENT ELECTIVE, Credits: 3</b>							Any ONE
1.	11 HS 201	Emotional Intelligence		3-0-0	3		
2.	11 HS 202	History of Management		3-0-0	3		
3.	11 HS 203	Indian Economy		3-0-0	3		
4.	11 HS 205	Professional Ethics & Values		3-0-0	3		
5.	11 HS 206	Behavioral Sciences		3-0-0	3		
6.	11 HS 208	Managing Personal Finances		3-0-0	3		
7.	11 HS 209	Basics of Marketing for Engineering		3-0-0	3		
8.	11 HS 210	Self Management		3-0-0	3		

9.	11 HS 211	Organization Management		3-0-0	3		
10.	11 HS 212	Resource Safety & Quality Management		3-0-0	3		
11.	13-HS 213	Disaster Management		3-0-0	3		
<b>AUDITED COURSES</b>							
1.	13-AC 201	Energy & Society			NIL	Nil	Compulsory
2.	13-AC 202	Employability Skills			NIL	Nil	Compulsory
3.	13-AC 301	Advanced Employability Skills			NIL	13-AC 202	Compulsory
4.	13-AC 203	Sports / Games / Yoga			NIL	Nil	Compulsory
5.	13-AC 204	NCC /NSS /NSO			NIL	Nil	Compulsory
6.	13-AC 302	Quantitative Aptitude and Reasoning			NIL	Nil	Compulsory
<b>NON-CREDIT COURSES:</b>							
1.	13-NC 201	Certificate Course-1		0-0-2	NIL	Nil	Compulsory
2.	13-NC 202	Certificate Course-1		0-0-2	NIL	Nil	Compulsory
<b>Term Paper</b>							
1.	13 TP 401	Term Paper		0-0-4	2		Compulsory
<b>OPEN ELECTIVE - CREDITS – 9 (Any Three )</b> (These Courses have to be taken only from across the Department, These Courses cannot be opted from the same discipline, any such special case needs the approval of respective B.O.S. Chairman)							
<b>L-T-P Structure for such courses will be 3-0-0 and Credits for each such course will be 3.</b>							
1.	13 OE	Robotics: Sensing and Control	<b>Even &amp; Odd</b>	3-0-0	3	<b>13-ES-205</b>	Open electives
2	13 OE	Mechatronics: Systems Approach	<b>Even &amp; Odd</b>	3-0-0	3	<b>13-ES-102, 13-ES-201</b>	
3.	13 OE	Intelligent Visual Surveillance	<b>Even &amp; Odd</b>	3-0-0	3	13-ES-205	
4.	13 OE	Total Quality Management	<b>Even &amp; Odd</b>	3-0-0	3	Nil	

5.	13 OE	Industrial Engineering & Management	<b>Even &amp; Odd</b>	3-0-0	3	<b>Nil</b>	
1.	09-ME 491	Final year Project	<b>Even Semester</b>	0-0-9	12		Any one
2.	09-ME 492	Final year Project	<b>Odd Semester</b>				
3.	12 PS 401	Practice School	<b>Even Semester</b>				
4.	12 PS 402	Practice School	<b>Odd Semester</b>				

\*\*\*\*\* PLEASE REFER THE NEXT PAGES FOR SPECIALIZATION ELECTIVES \*\*\*\*\*



## DEPARTMENT ELECTIVES FOR SPECIALIZATION

**Terms & Conditions:**

- A) By Choosing the following Department Electives, a B.Tech-Mechanical Engineering student, can opt for a Specialization in any one of the following areas.
- B) However the department reserves the right to offer / not offer the courses under electives in any of the semester.
- C) A Minimum of 60 students being registered for such courses is compulsory for the department to start running the course.

**AUTOMOBILE ENGINEERING**

1.	13-ME 335	Automobile Engineering	Even & Odd Semesters	3-0-0	3	13-ME 102, 13-ME 103	<b>SPECIALIZATION ELECTIVES: AUTOMOBILE ENGG.</b>
2.	13-ME345	Computer Aided Design	Even & Odd Semesters	3-0-0	3	13-ME 113	
3.	13-ME346	Vehicle Dynamics	Even & Odd Semesters	3-0-0	3	13-ME 111	
4.	13-ME-364	Automobile Chassis and Body Engineering	Even & Odd Semesters	3-0-0	3	13-ME 106	
5.	13-ME-336	Energy Systems & Performance	Even & Odd Semesters	3-0-0	3	13-ME 103	

**ASEROSPACE ENGINEERING**

1.	13-ME337	Computational Fluid Dynamics	Even & Odd Semesters	3-0-0	3	13-ME 101	<b>SPECIALIZATION ELECTIVES: AEROSPACE ENGG.</b>
2.	13-ME347	Rotor Dynamics	Even & Odd Semesters	3-0-0	3	13-ME 106	
3.	13-ME-348	Aero Structures	Even & Odd Semesters	3-0-0	3	13-ME 110	
4.	13-ME-338	Propulsion Engineering	Even & Odd Semesters	3-0-0	3	13-ME 101	
5.	13-ME-355	Mechatronics Systems and Control	Even & Odd Semesters	3-0-0	3	13-ME 109	

**FLEXIBLE MANUFACTURING SYSTEMS**

1.	13-ME-349	Fatigue, Creep and Fracture	Even & Odd Semesters	3-0-0	3	13-ME 110	<b>SPECIALIZATION ELECTIVES: FLEXIBLE MANUFACTURING SYTEMS</b>
2.	13-ME-365	Flexible Manufacturing Systems	Even & Odd Semesters	3-0-0	3	13-ME 107	
3.	13-ME-366	Modern Manufacturing Processes	Even & Odd Semesters	3-0-0	3	13-ME 107	
4.	13-ME-367	Cellular Manufacturing	Even & Odd Semesters	3-0-0	3	13-ME 107	
5.	13-ME-368	Computer Integrated Manufacturing	Even & Odd Semesters	3-0-0	3	13-ME 107	

## MECHATRONICS

1	13-ME-356	Mechatronic Systems & Control	Even & Odd Semesters	3-0-0	3	13-ME 109	SPECIALIZATION ELECTIVES: MECHATRONICS
2	13-ME-357	Modeling & Simulation of Mechatronic Systems	Even & Odd Semesters	3-0-0	3	13-ME 109	
3	13-ME-358	Signal Processing in Mechatronic Systems	Even & Odd Semesters	3-0-0	3	13-ES 111	
4	13-ME-359	Fuzzy Sets and Artificial Intelligence	Even & Odd Semesters	3-0-0	3	13-ES 108	
5	13-ME-360	Engineering Smart Materials for Mechatronics Applications	Even & Odd Semesters	3-0-0	3	13-ME 105	