## *COURSE CURRICULUM FOR THE NEW PROGRAMME (DD-TFE/CADA/CIM) w.e.f. 2017 BATCH*

### Semester I

| Course code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| MA 105 | Calculus | **3** | **1** | **0** | **8** |
| PH 107 | Quantum Physics | **2** | **1** | **0** | **6** |
| CH 105 | Organic Chemistry & Inorganic Chemistry | **2** | **0** | **0** | **4** |
| CH 107 | Physical Chemistry | **2** | **0** | **0** | **4** |
| *CS 101/ +BB 101 | Computer Programming/ Biology | **2** | **1** | **0** | **6** |
| ME 113 | Workshop Practice | **1** | **0** | **3** | **4** |
| *PH 117/ +CH 117 | Physics Lab Chemistry Lab | **0** | **0** | **3** | **3** |
| NC 101# | National Cadet Corps (NCC) | **0** | **0** | **0** | **P/NP** |
| NO 101# | National Sports Organization (NSS) | **0** | **0** | **0** | **P/NP** |
| NS 101# | National Service Scheme (NSS) | **0** | **0** | **0** | **P/NP** |
| | | | | | |
| | Total Credits | | | | **35** |

* Any one of these two courses and any one of these Lab courses only for **D1 D4**
\+ Only for D1 D2
\# Any one of these three P/NP courses

### Semester – II

| Course Code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| MA 108 | Ordinary Differential Equations | **2** | **0** | **0** | **4** |
| PH 108 | Electricity and Magnetism | **2** | **1** | **0** | **6** |
| *CS 101/ +BB 101 | Computer Programming/ Biology | **2** | **1** | **0** | **6** |
| ME 119 | Engineering Graphics & Drawing | **0** | **1** | **3** | **5** |
| *PH 117/ +CH 117 | Physics Lab Chemistry Lab | **0** | **0** | **3** | **3** |
| **CE 102 | Engineering Mechanics | **2** | **1** | **0** | **6** |
| NC 102# | National Cadet Corps (NCC) | **0** | **0** | **0** | **P/NP** |
| NO 102# | National Sports Organization (NSS) | **0** | **0** | **0** | **P/NP** |
| NS 102# | National Service Scheme (NSS) | **0** | **0** | **0** | **P/NP** |
| | | | | | |
| | | | | | |
| | Total Credits | | | | **34** |

* Any one of these two courses and any one of these Lab courses only for **D1 D2**
** Engineering Mechanics offered by Civil Engineering Department is the DIC
\+ Only for D3 D4
\# Any one of these three P/NP courses

***MECHANICAL ENGINEERING DEPARMENT***
***COURSE CURRICULUM FOR THE NEW PROGRAMME (DD-TFE/CADA/CIM) w.e.f. 2017 BATCH***

**Semester III**

| Course code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| ME 201 | Solid Mechanics | **2** | **1** | **0** | **6** |
| ME 209 | Thermodynamics | **2** | **1** | **0** | **6** |
| EE 101 | Introduction to Electrical and Electronics Circuits | **3** | **1** | **0** | **8** |
| MM 207 | Engineering Metallurgy | **2** | **1** | **0** | **6** |
| ME 219 | Fluid Mechanics | **3** | **1** | **0** | **8** |
| HS 101 | Economics | **2** | **1** | **0** | **6** |
| | | | | | |
| **Total** | | | | | **40** |

**Semester – IV**

| Course Code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| ME 202 | Strength of Materials | **2** | **1** | **0** | **6** |
| ME 226 | Mechanical Measurement | **2** | **1** | **0** | **6** |
| ME 206 | Manufacturing Processes I | **2** | **1** | **0** | **6** |
| MA 214 | Numerical Analysis | **3** | **1** | **0** | **8** |
| ME 224 | Fluid Mechanics Lab. | **0** | **0** | **3** | **3** |
| ME 218 | Solid Mechanics Lab | **0** | **0** | **3** | **3** |
| ME 213 | Manufacturing Practice Lab | | | | **5** |
| **Total** | | | | | **37** |

| *COURSE CURRICULUM FOR THE NEW PROGRAMME (DD-TFE) w.e.f. 2017 BATCH* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semester V** | | | | | | **Semester – VI** | | | | | |
| **Course code** | **Course Name** | **Credit Structure** | | | | **Course Code** | **Course Name** | **Credit Structure** | | | |
| | | **L** | **T** | **P** | **C** | | | **L** | **T** | **P** | **C** |
| ME 346 | Heat Transfer | **2** | **1** | **0** | **6** | ME 306 | Applied Thermodynamics | **2** | **1** | **0** | **6** |
| ME311 | Microprocessor and Automatic Controls | **2** | **1** | **0** | **6** | ME 316 | Kinematics and Dynamics of Machines | **2** | **1** | **0** | **6** |
| ME 338 | Manufacturing Processes II | **2** | **1** | **0** | **6** | | | | | | |
| HS 303 | Psychology or Sociology | **3** | **0** | **0** | **6** | ES 200 | Environmental studies, Science & Engineering | **3** | **0** | **0** | **3** |
| | | | | | | HS 200 | Environmental Studies | **3** | **0** | **0** | **3** |
| ME 374 | Manufacturing Processes Lab | **0** | **0** | **3** | **3** | ME 370 | Kinematics and Dynamics of Machines Lab | **0** | **0** | **3** | **3** |
| ME 307 | Mechanical Measurements Lab | **0** | **0** | **3** | **3** | ME 372 | Heat Transfer and Metrology Lab | **0** | **0** | **3** | **3** |
| ME 661 | Advanced Thermodynamics | **3** | **0** | **0** | **6** | ME 308 | Industrial Engg. and Operations Research | **2** | **1** | **0** | **6** |
| ME 651 | Fluid Dynamics | **2** | **1** | **0** | **6** | ME 310 | Microprocessor and Automatic Controls Lab. | **0** | **0** | **3** | **3** |
| | | | | | | | Department Elective I | **3** | **0** | **0** | **6** |
| | | | | | | | | | | | |
| **Total** | | | | | **42** | **Total** | | | | | **39** |

| *COURSE CURRICULUM FOR THE NEW PROGRAMME (DD-TFE) w.e.f. 2017 BATCH* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semester VII** | | | | | | **Semester – VIII** | | | | | |
| **Course code** | **Course Name** | **Credit Structure** | | | | **Course Code** | **Course Name** | **Credit Structure** | | | |
| | | **L** | **T** | **P** | **C** | | | **L** | **T** | **P** | **C** |
| ME 423 | Machine Design | **2** | **1** | **2** | **8** | | | | | | |
| | | | | | | | Department Elective IV | **3** | **0** | **0** | **6** |
| | Department Elective II | **3** | **0** | **0** | **6** | | Department Elective V | **3** | **0** | **0** | **6** |
| | Department Elective III | **3** | **0** | **0** | **6** | | Department Elective VI | **3** | **0** | **0** | **6** |
| | Institute Elective I | **3** | **0** | **0** | **6** | | | | | | |
| | | | | | | | Department Elective VII | **3** | **0** | **0** | **6** |
| | | | | | | | Institute Elective II | **3** | **0** | **0** | **6** |
| ME 441 | Applied Thermodynamics Lab | **0** | **0** | **3** | **3** | ME 657 | TFE Lab. | **3** | **0** | **0** | **6** |
| ME 663 | Advanced Heat Transfer | **3** | **0** | **0** | **6** | | | | | | |
| ME 704 | Computational methods in thermal and fluid engineering | **1** | **0** | **4** | **6** | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| **Total** | | | | | **41** | **Total** | | | | | **36** |

| *COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree TFE) w.e.f. 2017 BATCH* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semester IX** | | | | | | **Semester X** | | | | | |
| **Course code** | **Course Name** | **Credit Structure** | | | | **Course Code** | **Course Name** | **Credit Structure** | | | |
| | | **L** | **T** | **P** | **C** | | | **L** | **T** | **P** | **C** |
| | Department ElectiveVIII | 3 | 0 | 0 | 6 | ME | Dual Degree Project (Stage II) | 0 | 0 | 0 | 42 |
| | Department ElectiveIX | 3 | 0 | 0 | 6 | | | | | | |
| ME | Dual Degree Project (Stage I) | 0 | 0 | 0 | 30* | | | | | | |
| **Total** | | | | | **42** | **Total** | | | | | **42** |

* 10 for summer and 20 for semester IX.

## Important Instructions and List of Electives for Dual Degree TFE

(i) DD (TFE) program consists of 388 credits including 36 credits for 6 electives for the B.Tech. part, 2 institute elective,24 credits for honors, 24 credits for postgraduate level courses and 72 credits for DD project.

(ii) For honors each student must take ME 704 and 3 elective courses (18 credits).

(iii) For 6 B.Tech. electives, each student much select 6 courses from *List A* given in BTech Curriculum
(iv) For 3 electives (for the honors part), each student must select 3 courses from the elective list B-TFE given below.

(iv) For 4 postgraduate level courses, each student takes ME 651, ME 657, ME 661 and ME 663.

(v) For the 2 Institute Electives, follow the rule given in BTech Curriculum
.

**List B - TFE**

1. ME 403: Internal Combustion Engines

2. ME 406: Steam and Gas Turbines
3. ME 412: Computational Fluid Dynamics and Heat Transfer Lab
4. ME 415: Computational Fluid Dynamics and Heat Transfer
5. ME 434 Finite Element and Boundary Element Methods
6. ME 456: Automobile Engineering (Transmission)
7. ME 477: Introduction to Optimization
8. ME 613: Finite and Boundary Element Methods
9. ME 618: Pressure Vessel Design
10. ME 623/439: Cryogenics Engineering II
11. ME 652 : Advance Fluid Dynamics
12. ME 662: Convective Heat and Mass Transfer
13. ME 664: Advanced Finite and Boundary Element Methods
14. ME 665: Conduction and Radiation
15. ME 666: Heat Exchanger Design
16. ME 678: Fundamentals of Gas Dynamics
17. ME 680: Two Phase Flow and Heat Transfer/ ME 480
18. ME 681: Thermal and Environmental Engineering
19. ME 683/420: Cryogenic Engineering I
20. ME 684: Air Conditioning System Design
21. ME 685: Analytical Combustion
22. ME 695: Introduction to Nuclear Engineering
23. ME 724: Essentials of Turbulence
24. ME 725: Introduction to Transport Phenomena
25. ME 738 Nuclear Reactor Thermal Hydraulics
26. ME 739 Combustion & Emissions in IC Engines

27. ME 741 Turbulence and Combustions Modeling
28. ME 743 Optical Methods in Mechanical Engineering
29. ME 747 Interfacial Transport Phenomena
30. ME 410/758: Microfluidics*
31. ME 757 Galerkin Methods for Fluid Dynamics
32. ME 760/ME 445 Fuels and Combustion
33. ME 763 Geophysical Fluid Dynamics
34. ME 766 High Performance Scientific Computing
35. ME 769 Combustion in Automobile and Gas Turbine Engines
36. ME 770 Thermal Design of Electronics Equipment
37. ME 776 Fluid Structure Interaction.
38. ME 778 Moving Boundary Problems in Solidification
39. ME 780 Introduction to Biofluid Mechanics
40. EN 601: Non-ConventionalEnergy Sources.
41. EN 604: Fuel Cells
42. EN 613: Nuclear Reactor Theory
43. EN 615: Wind Energy Conversion Systems
44. EN 616: Direct Energy Conversion
45. EN 618: Energy Systems Modeling and Analysis
46. EN 619: Solar Energy for Industrial Process Heat
47. EN 630: Utilization of Solar Thermal Energy
48. EN 632: Waste to Energy
49. EN 634: Nuclear Reactor Thermal Hydraulics and Safety
50. EN 640: Solar Photovoltaic: Fundamentals, Technologies and Applications
51. EN 642: Power Generation and Systems Planning

52. EN 648: Combustion Engineering
53. AE 617: Numerical Methods for Conservation Laws
54. AE 622: Computing of High Speed Flows
55. AE 624: Hypersonic Flow Theory
56. AE 705: Introduction to Flight
57. AE 706: Computational Fluid Dynamics
58. AE 707: Aerodynamics of Aerospace Vehicles
59. AE 711: Aircraft Propulsion
60. AE 722: Grid Generation for Computational Mechanics
61. AE 724: Experimental Methods in Fluid Mechanics
62. AE 726: Heat Transfer – Aerospace Applications
63. AE 771: Matrix Computations
64. AE 782: Flow Control

Important Note :

- Students are permitted to register for only one out of these two courses:
  1. ME 602 (Fatigue, Fracture and Failure Analysis) 2. ME 616 Fracture Mechanics
- If a course has two course codes ( Eg. Microfluidics - ME410 and ME758), you may register for the course only once with a course code suitable to you

| *COURSE CURRICULUM FOR THE NEW PROGRAMME (DD- CADA.) w.e.f. 2017 BATCH* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semester V** | | | | | | **Semester – VI** | | | | | |
| **Course code** | **Course Name** | **Credit Structure** | | | | **Course Code** | **Course Name** | **Credit Structure** | | | |
| | | **L** | **T** | **P** | **C** | | | **L** | **T** | **P** | **C** |
| ME 346 | Heat Transfer | **2** | **1** | **0** | **6** | ME 306 | Applied Thermodynamics | **2** | **1** | **0** | **6** |
| ME 311 | Microprocessor and Automatic Controls | **2** | **1** | **0** | **6** | ME 316 | Kinematics and Dynamics of Machines | **2** | **1** | **0** | **6** |
| ME 338 | Manufacturing Processes II | **2** | **1** | **0** | **6** | | | | | | |
| HS 303 | Psychology or Sociology | **3** | **0** | **0** | **6** | ES 200 | Environmental studies, Sci & Eng | **3** | **0** | **0** | **3** |
| | | | | | | HS 200 | Environmental Studies | **3** | **0** | **0** | **3** |
| ME 374 | Manufacturing Processes Lab | **0** | **0** | **3** | **3** | ME 370 | Kinematics and Dynamics of Machines Lab | **0** | **0** | **3** | **3** |
| ME XXX | Mechanical Measurements Lab | **0** | **0** | **3** | **3** | ME 372 | Heat Transfer and Metrology Lab | **0** | **0** | **3** | **3** |
| | Department Elective I | **3** | **0** | **0** | **6** | ME 308 | Industrial Engg. and Operations Research | **2** | **1** | **0** | **6** |
| | Department Elective II | **3** | **0** | **0** | **6** | ME 310 | Microprocessor and Automatic Controls Lab. | **0** | **0** | **3** | **3** |
| | | | | | | | Department Elective III | **3** | **0** | **0** | **6** |
| | | | | | | | | | | | |
| **Total** | | | | | **42** | **Total** | | | | | **39** |

## *COURSE CURRICULUM FOR THE NEW PROGRAMME (DD-CADA.) w.e.f. 2017 BATCH*

### Semester VII

| Course code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| ME 423 | Machine Design | **2** | **1** | **2** | **8** |
| | Department Elective IV | **3** | **0** | **0** | **6** |
| | Department Elective V | **3** | **0** | **0** | **6** |
| | Department Elective VI | **3** | **0** | **0** | **6** |
| | Department Elective VII | **3** | **0** | **0** | **6** |
| | Institute Elective I | **3** | **0** | **0** | **6** |
| ME 441 | Applied Thermodynamics Lab | **0** | **0** | **3** | **3** |
| | | | | | |
| **Total** | | | | | **41** |

### Semester – VIII

| Course Code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| | Department Elective VIII | **3** | **0** | **0** | **6** |
| | Department Elective IX | **3** | **0** | **0** | **6** |
| | Department Elective X | **3** | **0** | **0** | **6** |
| | Department Elective XI | **3** | **0** | **0** | **6** |
| | Department Elective XII | **3** | **0** | **0** | **6** |
| | Institute Elective II | **3** | **0** | **0** | **6** |
| | | | | | |
| **Total** | | | | | **36** |

## *COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree CADA) w.e.f. 2017 BATCH*

### Semester IX

| Course code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| | Department Elective XIII | 3 | 0 | 0 | 6 |
| | Department Elective XIV | 3 | 0 | 0 | 6 |
| ME | Dual Degree Project (Stage I) | 0 | 0 | 0 | 30 |
| **Total** | | | | | **42** |

### Semester X

| Course Code | Course Name | Credit Structure | | | |
|---|---|---|---|---|---|
| | | **L** | **T** | **P** | **C** |
| ME | Dual Degree Project (Stage II) | 0 | 0 | 0 | 42 |
| **Total** | | | | | **42** |

## Important Instructions and List of Electives for Dual Degree CADA

i) DD (CADA) program consists of 388 credits including 36 credits for 6 electives for the B.Tech. part, 2 institute elective,24 credits for honors, 24 credits for postgraduate level courses and 72 credits for project.

(ii) For honors each students must take 4 electives (24 credits) from the elective list B- CADA

(iii). For 4 postgraduate level courses (24 credits), students have to take 4 courses from the elective list B- CADA

(iii) For 6 B.Tech. electives, each student much select 6 courses from *List A* given in BTech Curriculum

(v) For the 2 Institute Electives, follow the rule given in BTech Curriculum

**List B- CADA**

1. ME 340 Analytical Methods in Engineering Applications
2. ME 356 Mechanization
3. ME 434 Finite Element and Boundary Element Methods
4. ME 477 Introduction to Optimization
5. ME 6106 Computational Structural Dynamics
6. ME 6112 Acoustics and Hearing
7. ME 613 Finite and Boundary Element Methods
8. ME 601 Stress Analysis
9. ME 602 Fatigue, Fracture and Failure Analysis *
10. ME 603 Kinematics and Dynamics of Machinery
11. ME 604 Robotics
12. ME 606 Computer Aided Design of Machines
13. ME 6102 Design of Mechatronic System
14. ME 6106 Computational Structural Dynamics
15. ME 6112 Acoustics and Hearing

16. ME 615 Machinery Vibration and Diagnostics
17. ME616 Fracture Mechanics
18. ME 617 Rapid Product Development
19. ME 618 Pressure Vessel Design
20. ME621 Mathematical Methods for Mechanics and Dynamics
21. ME 637 Manufacturing Automation
22. ME 639 Linear Systems Theory
23. ME645 MEMS – Design, Fabrication and Characterisation
24. ME 647 Automatic Control Engineering
25. ME 664 Advanced Finite and Boundary Element Methods
26. ME 667 Industrial Noise Control
27. ME 669 Design for Manufacturing
28. ME 673 Mathematical Methods in Engineering
29. ME 675 Theory of Plasticity
30. ME 676 Collaborative Engineering
31. ME 679 Micromechanics of Composites
32. ME 695 Introduction to Nuclear Engineering
33. ME 710 Vibration Engg.
34. ME 711 Manufacturing Planning and Control
35. ME 712 Computer Numerical Control and Programming
36. ME 714 Computer Integrated Manufacturing
37. ME 733 Nuclear Safety and Reliability
38. ME734 Vibro-acoustics
39. ME 735 Computer Graphics and Product Modeling
40. ME 743 Optical Methods in Mechanical Engineering

41. ME 748 Computer Aided Simulation of Machines
42. ME754 Textile Machines Design & Automation
43. ME 755 Advanced Mechanics of Solid
44. ME 759 Nonlinear Finite Element Methods
45. ME 762 Advanced Engineering Dynamics
46. ME 765 Micro-forming
47. ME 766 High Performance Scientific Computing
48. ME 768 Introduction to Microsystems Packaging
49. ME 773 Reliability modelilng and analysis of engineering systems
50. ME 775 Mechanisms in Crystal Plasticity
51. ME 778 Moving Boundary Problems in Solidification
52. ME 779 Control Systems
53. ME 782 Design Optimization
54. SC 601 Modeling of Dynamic Systems
55. SC 602 Control of Nonlinear Dynamical Systems
56. SC607 Optimization
57. SC 620 Automation and Feedback Control
58. SC 623 Optimal and Robust Control
59. SC 624 Differential Geometric Methods in Control
60. SC 625 Systems Theory
61. SC634 Wheeled Mobile Robotics
62. IE 702 Neural Networks Fuzzy Systems and Applications

Important Note:

- Students are permitted to register for only one out of these two courses:

  1. ME 602 (Fatigue, Fracture and Failure Analysis) 2. ME 616 Fracture Mechanics

- If a course has two course codes (Eg. Microfluidics - ME410 and ME758), you may register for the course only once with a course code suitable to

you

| *COURSE CURRICULUM FOR THE NEW PROGRAMME (DD-CIM.) w.e.f. 2017 BATCH* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semester V** | | | | | | **Semester – VI** | | | | | |
| **Course code** | **Course Name** | **Credit Structure** | | | | **Course Code** | **Course Name** | **Credit Structure** | | | |
| | | **L** | **T** | **P** | **C** | | | **L** | **T** | **P** | **C** |
| ME 346 | Heat Transfer | **2** | **1** | **0** | **6** | ME 306 | Applied Thermodynamics | **2** | **1** | **0** | **6** |
| ME 311 | Microprocessor and Automatic Controls | **2** | **1** | **0** | **6** | ME 316 | Kinematics and Dynamics of Machines | **2** | **1** | **0** | **6** |
| ME 338 | Manufacturing Processes II | **2** | **1** | **0** | **6** | | | | | | |
| HS 303 | Psychology or Sociology | **3** | **0** | **0** | **6** | ES 200 | Environmental studies, Sci & Eng | **3** | **0** | **0** | **3** |
| | | | | | | HS 200 | Environmental Studies | **3** | **0** | **0** | **3** |
| ME 374 | Manufacturing Processes Lab | **0** | **0** | **3** | **3** | ME 370 | Kinematics and Dynamics of Machines Lab | **0** | **0** | **3** | **3** |
| ME XXX | Mechanical Measurements Lab | **0** | **0** | **3** | **3** | ME 372 | Heat Transfer and Metrology Lab | **0** | **0** | **3** | **3** |
| | Department Elective I | **3** | **0** | **0** | **6** | ME 308 | Industrial Engg. and Operations Research | **2** | **1** | **0** | **6** |
| | Department Elective II | **3** | **0** | **0** | **6** | ME 310 | Microprocessor and Automatic Controls Lab. | **0** | **0** | **3** | **3** |
| | | | | | | ME714 | Computer Integrated Manufacturing | **3** | **0** | **0** | **6** |
| | | | | | | | | | | | |
| **Total** | | | | | **42** | **Total** | | | | | **39** |

| *COURSE CURRICULUM FOR THE NEW PROGRAMME (DD-CIM) w.e.f. 2017 BATCH* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semester VII** | | | | | | **Semester – VIII** | | | | | |
| **Course code** | **Course Name** | **Credit Structure** | | | | **Course Code** | **Course Name** | **Credit Structure** | | | |
| | | **L** | **T** | **P** | **C** | | | **L** | **T** | **P** | **C** |
| ME 423 | Machine Design | **2** | **1** | **2** | **8** | | Department Elective VI | **3** | **0** | **0** | **6** |
| | Department Elective III | **3** | **0** | **0** | **6** | | DepartmentElective VII | **3** | **0** | **0** | **6** |
| | Department Elective IV | **3** | **0** | **0** | **6** | | Department Elective VII | **3** | **0** | **0** | **6** |
| | Department Elective V | **3** | **0** | **0** | **6** | | Department Elective IX | **3** | **0** | **0** | **6** |
| | ME 409 | | | | **6** | | Department Elective X | **3** | **0** | **0** | **6** |
| | Institute Elective I | **3** | **0** | **0** | **6** | | Institute Elective II | **3** | **0** | **0** | **6** |
| ME 441 | Applied Thermodynamics Lab | **0** | **0** | **3** | **3** | | | | | | |
| **Total** | | | | | **41** | **Total** | | | | | **36** |

| *COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree CIM) w.e.f. 2017 BATCH* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semester IX** | | | | | | **Semester X** | | | | | |
| **Course code** | **Course Name** | **Credit Structure** | | | | **Course Code** | **Course Name** | **Credit Structure** | | | |
| | | **L** | **T** | **P** | **C** | | | **L** | **T** | **P** | **C** |
| | Department Elective XI | 3 | 0 | 0 | 6 | ME | Dual Degree Project (Stage II) | 0 | 0 | 0 | 42 |
| | Department Elective XII | 3 | 0 | 0 | 6 | | | | | | |
| ME | Dual Degree Project (Stage I) | 0 | 0 | 0 | 30 | | | | | | |
| **Total** | | | | | **42** | **Total** | | | | | **42** |

## Important Instructions and List of Electives for Dual Degree CIM

(i) DD (CIM) program consists of 388 credits including 36 credits for 6 electives for the B.Tech. part, 2 institute elective 24 credits for honors, 24 credits for postgraduate level courses and 72 credits for project.

(ii) For honors each students must take courses ME 409 and ME 714 and 2 electives (12 credits) from the elective B CIM*

(iii) For the postgraduate level courses each student must take 4 electives (24 credits) from the list of electives B CIM*.

(iii) For 6 B.Tech. electives, each student much select 6 courses from *List A* given in BTech Curriculum

(v) For the 2 Institute Electives, follow the rule given in BTech Curriculum

**List B CIM***

Each student must take **minimum 4** courses from **Manufacturing courses**

**Manufacturing Courses**

1. ME 340 Analytical Methods in Engineering Applications

2. ME 4101 Design of Welded Structure
3. ME 613 Finite and Boundary Element Methods
4. ME 617 Rapid Product Development
5. ME 636 Advanced Joining Technology
6. ME 637 Manufacturing Automation
7. ME 478 Management Principles and Practice
8. ME 6102 Design of Mechatronic Systems
9. ME 6104 Maintenance Engineering and Management
10. ME 6108 Quality Measurement, Monitoring and Improvement
11. ME 6110 Nanomanufacturing Processes
12. ME 636 Advanced Joining Technology
13. ME 642 Advanced Tool Design
14. ME 645 MEMS Design, Manufacture and Characterisation
15. ME 647 Automatic Control Engineering
16. ME 649 Advanced Manufacturing Processes I
17. ME 659 Advanced Manufacturing Processes II
18. ME 669 Design for Manufacturing
19. ME 673 Mathematical Methods in Engineering
20. ME 675 Theory of Plasticity
21. ME 676 Collaborative Engineering
22. ME 677 Laser Material Processing
23. ME 679 Micromechanics of Composites
24. ME 711 Manufacturing Planning and Control
25. ME 712 Computer Numerical Control and Programming.
26. ME 728 Intelligent Product Design and Manufacturing

27. ME 730 Ultra-precision Machining
28. ME 735 Computer Graphics and Product Modeling
29. ME 743 Optical Methods in Mechanical Engineering
30. ME 748 Computer Aided Simulation of Machines
31. ME 750 Sheet Metal Engineering
32. ME 755 Advanced Mechanics of Solid
33. ME 756 Numerical Modeling of Manufacturing Processes
34. ME 759 Nonlinear Finite Element Methods
35. ME 761 Advanced Stereology and Microstructural Analysis
36. ME 765 Micro-forming
37. ME 766 High Performance Scientific Computing
38. ME 768 Introduction to Microsystems Packaging
39. ME 772 Processing of Aerospace Materials
40. ME 773 Reliability modelilng and analysis of engineering systems
41. ME 774 Aerospace Materials Processing II
42. ME 775 Mechanisms in Crystal Plasticity
43. ME 778 Moving Boundary Problems in Solidification
44. ME 781 Engineering Data Mining And Applications

**Industrial Engineering and Operations Research Courses**

1. ME 408 Industrial Engineering and Operations Research – II
2. ME 711 Manufacturing Planning and Control
3. ME 732 Selected Applications of O.R. &AI in Manufacturing systems
4. IE 501 Optimization Models
5. IE 502 Probabilistic Models

6. IE 503 Operations Analysis
7. IE 504 Service and Infrastructure Systems
8. IE 505 Computer Programming and Algorithms
9. IE 601 Deterministic Models of Optimization and O.R.
10. IE 602 Service Engineering and Management
11. IE 603 Discrete Event Systems Simulation
12. IE 604 System Dynamics : Modeling and Analysis
13. IE 605 Engineering Statistics
14. IE 611 Introduction Stochastic Modeling
15. IE 612 Introduction to Financial Engineering
16. IE 614 Linear Systems
17. IE 616 Decision Analysis and Game Theory
18. IE 635 Facilities Planning
19. IE 641 Network flow models and Integration
20. IE 643 Deep Learning - Theory and Practice
21. IE 645 Industrial Scheduling
22. IE 646 Quality Engineering and Management
23. IE 647 Applications of Integer Programming
24. IE 648 Quantitative Analysis of Finance and Marketing
25. IE 651 Inventory planning and management
26. IE 702 Neural Network & Fuzzy System
27. IE 703 Knowledge based systems and applications
28. IE 704 Selected Topics in AI for Operations Research
29. IE705 Quantitative methods in Project Management
30. IE 706 Pricing and Revenue Management

31. IE 707 Multi-player Decision Making Models
32. IE 708 Markov Decision Processes
33. IE 710 O.R Applications in Infrastructure & Service Sectors
34. IE 712 Selected Applications of Stochastic Models
35. IE 714 Supply Chain Management

Important Note:

1. Students are permitted to register for only one out of these two courses:
   1. ME 602 (Fatigue, Fracture and Failure Analysis) 2. ME 616 Fracture Mechanics

2. If a course has two course codes ( Eg . Microfluidics - ME410 and ME758), you may register for the course only once with a course code suitable to you.