

MECHANICAL ENGINEERING

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree TFE, CADA and CIM) w.e.f. 2007 BATCH

Semester I						Semester II					
Course code	Course Name	Credit Structure				Course Code	Course Name	Credit Structure			
		L	T	P	C			L	T	P	C
CH 103+	Chemistry	2	1	0	6	MA 106 And MA 108	Linear Algebra and Ordinary Differential Equations I	3	1	0	8
CS 101	Computer Programming	2	0	2	6	CH 103+	Chemistry	2	1	0	6
HS 101	Economics	3	0	0	6	PH 103*	Electricity and Magnetism	3	0	0	6
A 105	Calculus	3	1	0	8	PH 105*	Modern Physics	3	1	0	8
PH 103*	Electricity and Magnetism	2	1	0	6	ME 152	Introduction to Mechanical Engg.	3	0	0	6
PH 105*	Modern Physics	2	1	0	6	IC102	Data Analysis and Interpretations	2	1	0	6
CH 117+	Chemistry Lab	0	0	3	3	CH 117*	Chemistry Lab.	0	0	3	3
ME 113*	Workshop Practice	0	1	3	5	ME 113+	Workshop Practice	0	1	3	5
ME 119*	Engineering Graphics and Drawing	1	0	3	5	ME 119+	Engineering Graphics and Drawing	0	1	3	5
PH 117+	Physics Lab	0	0	3	3	PH 117*	Physics Lab.	0	0	3	3
NC 101#	National Cadet Corps (NCC)	0	0	0	P/NP	NC 102#	National Cadet Corps (NCC)	0	0	0	P/NP
NO 101#	National Sports Organization (NSS)	0	0	0	P/NP	NO 102#	National Sports Organization (NSS)	0	0	0	P/NP
NS 101#	National Service Scheme (NSS)	0	0	0	P/NP	NS 102#	National Service Scheme (NSS)	0	0	0	P/NP
* Any one of these two courses and any one of these Lab courses only for D3 D4 + Only for D1 D2 # Any one of these three P/NP courses						* 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 DEPARTMENT
COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree TFE, CADA and CIM) w.e.f. 2007 BATCH

Semester III						Semester IV					
Course code	Course Name	Credit Structure				Course Code	Course Name	Credit Structure			
		L	T	P	C			L	T	P	C
ME 201	Solid Mechanics	2	1	0	6	ME 202	Strength of Materials	2	1	0	6
ME 209	Thermodynamics	2	1	0	6	ME 203	Fluid Mechanics	2	1	0	6
EE 101	Electric Circuits	3	1	0	8	ME 206	Manufacturing Processes I	2	1	0	6
MM 206	Engineering Metallurgy	2	1	0	6	MA 214	Numerical Analysis	3	1	0	8
	Institute Elective I	3	0	0	6		Institute Elective II	3	0	0	6
IC 211	Experimental Engineering Lab	0	0.5	3	4	ME 218	Solid Mechanics Lab	0	0	3	3
						ME 213	Manufacturing Practice Lab.	0	1	3	5
Total						Total					
36						40					
COURSES FOR HONOR REQUIREMENT						COURSES FOR HONOR REQUIREMENT					
COURSES FOR MINOR REQUIREMENT						COURSES FOR MINOR REQUIREMENT					

MECHANICAL ENGINEERING

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree TFE) w.e.f. 2007 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 407	Industrial Engg. and Operations Research	2	1	0	6	ME 316	Kinematics and Dynamics of Machines	2	1	0	6
ME 338	Manufacturing Processes II	2	1	0	6		Dual Degree Elective I	3	0	0	6
HS 301/ HS 303/ HS 305/ HS 307	Philosophy/ Psychology/ Literature/ Sociology	3	0	0	6		Dual Degree Elective II	3	0	0	6
ME 661	Advanced Thermodynamics	3	0	0	6	ES 200 And HS 200	Environmental Studies: Science and Engg And Environmental Studies	3	0	0	3
ME 651	Fluid Dynamics	2	1	0	6			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 214	Fluid Mechanics Lab	0	0	3	3	ME 372	Heat Transfer and Metrology Lab	0	0	3	3
Total					42	Total					36
COURSES FOR HONOR REQUIREMENT						COURSES FOR HONOR REQUIREMENT					

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree TFE) w.e.f. 2007 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		Dual Degree Elective III	3	0	0	6
ME 401	Microprocessors and Automatic Control	2	1	0	6		Dual Degree Elective IV	3	0	0	6
ME 663	Advanced Heat Transfer	3	0	0	6		Dual Degree Elective V	3	0	0	6
ME 704	Computational Methods in TFE	3	0	0	6		Dual Degree Elective VI	3	0	0	6
ME 657	TFE Lab	1	0	4	6		Dual Degree Elective VII	3	0	0	6
ME 441	Applied Thermodynamics Lab	0	0	3	3		Dual Degree Elective VIII	3	0	0	6
ME 421	Microprocessors and Automatic Control Lab	0	0	3	3						
Total					38	Total					36
COURSES FOR HONOR REQUIREMENT						COURSES FOR HONOR REQUIREMENT					
COURSES FOR MINOR REQUIREMENT						COURSES FOR MINOR REQUIREMENT					

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree TFE) w.e.f. 2007 BATCH

Semester IX			Semester X		
Course	Course Name	Credit Structure	Course	Course Name	Credit Structure

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree TFE) w.e.f. 2007 BATCH

code		L	T	P	C	Code		L	T	P	C
	Dual Degree Elective IX	3	0	0	6	ME 594	Dual Degree Project (Stage II)	0	0	0	42
	Dual Degree Elective X	3	0	0	6						
ME 593	Dual Degree Project (Stage I)	0	0	0	30*						
Total					42	Total					42
COURSES FOR HONOR REQUIREMENT						COURSES FOR HONOR REQUIREMENT					
COURSES FOR MINOR REQUIREMENT						COURSES FOR MINOR REQUIREMENT					

* 10 for summer and 20 for semester IX.

Important Instructions and List of Electives for Dual Degree TFE

- (i) DD (TFE) program consists of 381 credits including 36 credits for 6 electives for the B.Tech. part, 30 credits for honors, 24 credits for postgraduate level courses and 72 credits for project.

- (ii) For honors each student must take ME 704 and 4 elective courses (24 credits).
- (iii) For 6 B.Tech. electives and 4 electives (for the honors part) each student must select 10 courses from the elective list I to X given below.
- (iv) For 4 postgraduate level courses each student takes ME 651, ME 657, ME 661 and ME 663.
- (v) Note the instructions given below.

Dual Degree Electives I to X

- Note:**
- 1) Two DD Electives can be taken from outside the lists given below. These may be from any Department.
 - 2) Each student must take courses amounting to **minimum** 24 credits (for **honors** part of the programme) from the following.
 - 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 456: Automobile Engineering (Transmission)
 - 6. ME 477: Introduction to Optimization
 - 7. ME 613: Finite and Boundary Element Methods
 - 8. ME 618: Pressure Vessel Design
 - 9. ME 623: Cryogenics Engineering II
 - 10. ME 662: Convective Heat and Mass Transfer
 - 11. ME 664: Advanced Finite and Boundary Element Methods
 - 12. ME 665: Conduction and Radiation
 - 13. ME 666: Heat Exchanger Design
 - 14. ME 678: Fundamentals of Gas Dynamics

15. ME 681: Thermal and Environmental Engineering
16. ME 683: Cryogenic Engineering I
17. ME 684: Air Conditioning System Design
18. ME 724: Essentials of Turbulence
19. ME 410/758: Microfluidics
22. EN 601: Non-Conventional Energy Sources
23. EN 604: Fuel Cells
24. EN 613: Nuclear Reactor Theory
25. EN 615: Wind Energy Conversion Systems
26. EN 616: Direct Energy Conversion
27. EN 618: Energy Systems Modeling and Analysis
28. EN 619: Solar Energy for Industrial Process Heat
29. EN 630: Utilization of Solar Thermal Energy
30. EN 632: Waste to Energy
31. EN 634: Nuclear Reactor Thermal Hydraulics and Safety
32. EN 640: Solar Photovoltaic: Fundamentals, Technologies and Applications
33. EN 642: Power Generation and Systems Planning
34. EN 648: Combustion Engineering
35. AE 617: Numerical Methods for Conservation Laws
36. AE 622: Computing of High Speed Flows
37. AE 624: Hypersonic Flow Theory
38. AE 705: Introduction to Flight
39. AE 706: Computational Fluid Dynamics
40. AE 707: Aerodynamics of Aerospace Vehicles
41. AE 711: Aircraft Propulsion

42. AE 722: Grid Generation for Computational Mechanics
43. AE 724: Experimental Methods in Fluid Mechanics
44. AE 726: Heat Transfer – Aerospace Applications
45. AE 771: Matrix Computations
46. AE 782: Flow Control

3) Each student can take courses amounting to **maximum** 36 credits (for **B.Tech.** electives part of the programme) from the following.

1. ME 342 Analytical Methods in Engineering
2. ME 350 Refrigeration and Air-Conditioning
3. ME 360 Power Plant Engineering
4. ME 403 Internal Combustion Engines
5. ME 406 Steam and Gas Turbines
6. ME 408 Industrial Engineering and Operational Research II
7. ME 410/758 Microfluidics
8. ME 415 Computational Fluid Dynamics and Heat Transfer
9. ME 445 Fuels and Combustion
10. ME 440 Industrial Tribology
11. ME 456 Automobile Engineering (Transmission)
12. ME 617 Rapid Product Development
13. ME 623 Cryogenics II
14. ME 662 Convective Heat and Mass Transfer
15. ME 663 Advanced Heat Transfer
16. ME 665 Conduction and Radiation Heat Transfer
17. ME 669 Design for Manufacturing

18. ME 676 Collaborative Engineering
19. ME 678 Fundamentals of Gas Dynamics
20. ME 681 Thermal Environment Engineering
21. ME 683 Cryogenic Engineering I
22. ME 684 Air-Conditioning System Design
23. ME 724 Essentials of Turbulence
24. ME 730 Ultra Precision Machining
25. ME 732 Selected Application of AI & OR in Manufacturing Systems
26. ME 750 Sheet Metal Engineering
27. ME 756 Numerical Modeling of Manufacturing Processes
28. ME 7XX Casting Design and Simulation
29. ME 7XX Science and Technology of Welding
30. ME 7XX Analysis of Metal Forming Processes
31. ME 7XX Advances in Material Removal Processes
32. EN 601 Non-Conventional Energy Sources
33. EN 604 Fuel Cells
34. EN 613 Nuclear Reactor Theory
35. EN 615 Wind Energy Conversion Systems
36. EN 616 Direct Energy Conversion
37. EN 618 Energy Systems Modeling and Analysis
38. EN 619 Solar Energy for Industrial Process Heat
39. EN 630 Utilization of Solar Energy
40. EN 634 Nuclear Reactor Thermal Hydraulics and Safety
41. EN 640 Solar Photovoltaic: Fundamentals, Technologies & Applications
42. EN 642 Power Generation and Systems Planning

43. IE 601 Deterministic Models of Optimization and Operations Research
44. IE 603 Discrete Event System Simulation
45. IE 611 Introduction to Stochastic Models
46. IE 612 Introduction to Financial Engineering
47. IE 642 Engineering Economic Analysis
48. IE 645 Industrial Scheduling
49. IE 646 Quality Engineering and Management Systems
50. IE 647 Applied Integer Programming
51. IE 651 Inventory Control and Management Systems
52. IE 6XX System Dynamics Modeling and Analysis
53. IE 702 Neural Network & Fuzzy System
54. IE 703 Introduction to Knowledge Based Systems and Applications
55. IE 704 Selected Applications of AI in Operations Research
56. IE 705 Quantitative Methods in Project Management
57. IE 706 Pricing and Revenue Management
58. IE 707 Multi-Player Decision Making Models
59. IE 708 Markov Decision Processes
60. IE 710 O.R Applications in Infrastructure & Service Sectors
61. IE 712 Selected Applications of Stochastic Models
62. IE 714 Quantitative Models for Supply Chain Management

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree CADA) w.e.f. 2007 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 407	Industrial Engg. and Operations Research	2	1	0	6	ME 316	Kinematics and Dynamics of Machines	2	1	0	6
ME 338	Manufacturing Processes II	2	1	0	6		Dual Degree Elective III	3	0	0	6
HS 301/ HS 303/ HS 305/ HS 307	Philosophy/ Psychology/ Literature/ Sociology	3	0	0	6		Dual Degree Elective IV	3	0	0	6
	Dual Degree Elective I	3	0	0	6	ES 200 And HS 200	Environmental Studies: Science and Engg And Environmental Studies	3	0	0	3
	Dual Degree Elective II	3	0	0	6			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 214	Fluid Mechanics Lab	0	0	3	3	ME 372	Heat Transfer and Metrology Lab	0	0	3	3
Total					42	Total					36
COURSES FOR HONOR REQUIREMENT						COURSES FOR HONOR REQUIREMENT					

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree CADA) w.e.f. 2007 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

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree CADA) w.e.f. 2007 BATCH											
ME 423	Machine Design	2	1	2	8		Dual Degree Elective VIII	3	0	0	6
ME 401	Microprocessors and Automatic Control	2	1	0	6		Dual Degree Elective IX	3	0	0	6
	Dual Degree Elective V	3	0	0	6		Dual Degree Elective X	3	0	0	6
	Dual Degree Elective VI	3	0	0	6		Dual Degree Elective XI	3	0	0	6
	Dual Degree Elective VII	3	0	0	6		Dual Degree Elective XII	3	0	0	6
							Dual Degree Elective XIII	3	0	0	6
ME 441	Applied Thermodynamics Lab	0	0	3	3						
ME 421	Microprocessors and Automatic Control Lab	0	0	3	3						
Total					38	Total					36
COURSES FOR HONOR REQUIREMENT						COURSES FOR HONOR REQUIREMENT					
COURSES FOR MINOR REQUIREMENT						COURSES FOR MINOR REQUIREMENT					

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree CADA) w.e.f. 2007 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
	Dual Degree Elective XIV	3	0	0	6	ME 594	Dual Degree Project (Stage II)	0	0	0	42
	Dual Degree Elective XV	3	0	0	6						

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree CADA) w.e.f. 2007 BATCH													
ME 593	Dual Degree Project (Stage I)	0	0	0	30								
Total						42	Total						42
COURSES FOR HONOR REQUIREMENT						COURSES FOR HONOR REQUIREMENT							
COURSES FOR MINOR REQUIREMENT						COURSES FOR MINOR REQUIREMENT							

Important Instructions and List of Electives for Dual Degree CADA

- (i) DD (CADA) program consists of 381 credits including 36 credits for 6 electives for the B.Tech. part, 30 credits for honors, 24 credits for postgraduate level courses and 72 credits for project.
- (ii) For honors each students must take 5 electives (30 credits) from the elective list V to IX given below.
- (iii) For 4 postgraduate level courses (24 credits) and 6 B.Tech. electives (36 credits) each student must select 10 courses from the elective list I to IV and X to XV given below.

(iv) Note the instructions given below.

Dual Degree Electives I to IV and X to XV

- Note:**
- 1) Two DD electives can be taken from outside the lists given below. These may be from any Department.
 - 2) Each student must take courses amounting to **minimum** 24 credits (for **postgraduate** level courses) from the following.
 1. ME 603 Kinematics and Dynamics of Machinery
 2. ME 645 MEMS: Design, Fabrication and Characterization
 3. ME 639 Linear Systems Theory
 4. ME 621 Mathematical Methods for Applied Mechanics
 5. ME 637 Manufacturing Automation
 6. ME 667 Industrial Noise Control
 7. ME 669 Design for Manufacturing
 8. ME 712 Computer Numerical Control and Programming
 9. SC 601 Modeling of Dynamic Systems
 10. SC 625 Systems Theory
 11. ME 602 Fatigue, Fracture and Failure Analysis *
 12. ME 616 Fracture Mechanics *
 13. ME 618 Pressure Vessel Design
 14. ME 606 Computer Aided Design of Machines
 15. ME 664 Advanced Finite and Boundary Element Methods
 16. ME 615 Machinery Vibration and Diagnostics
 17. ME 734 Vibro-Acoustics
 18. ME 754 Textile Machinery Design and Automation

19. IE 702 Neural Networks Fuzzy Systems and Applications
20. ME 714 Computer Integrated Manufacturing
21. ME 735 Computer Graphics and Product Modeling
22. SC 623 Optimal and Robust Control
23. SC 624 Special Topics in Systems and Control

* Students are permitted to register for only one of these two (ME 602 and 616) courses.

3) Each student can take courses amounting to **maximum** 36 credits (for **B.Tech.** electives part of the programme) from the following.

1. ME 342 Analytical Methods in Engineering
2. ME 350 Refrigeration and Air-Conditioning
3. ME 360 Power Plant Engineering
4. ME 403 Internal Combustion Engines
5. ME 406 Steam And Gas Turbines
6. ME 408 Industrial Engineering and Operational Research II
7. ME 410/758 Microfluidics
8. ME 415 Computational Fluid Dynamics and Heat Transfer
9. ME 445 Fuels and Combustion
10. ME 440 Industrial Tribology
11. ME 456 Automobile Engineering (Transmission)
12. ME 617 Rapid Product Development
13. ME 623 Cryogenics II
14. ME 662 Convective Heat and Mass Transfer
15. ME 663 Advanced Heat Transfer
16. ME 665 Conduction and Radiation Heat Transfer

17. ME 669 Design for Manufacturing
18. ME 676 Collaborative Engineering
19. ME 678 Fundamentals of Gas Dynamics
20. ME 681 Thermal Environment Engineering
21. ME 683 Cryogenic Engineering I
22. ME 684 Air-Conditioning System Design
23. ME 724 Essential of Turbulence
24. ME 730 Ultra Precision Machining
25. ME 732 Selected Application of AI & OR in Manufacturing Systems
26. ME 750 Sheet Metal Engineering
27. ME 756 Numerical Modeling of Manufacturing Processes
28. ME 7XX Casting Design and Simulation
29. ME 7XX Science and Technology of Welding
30. ME 7XX Analysis of Metal Forming Processes
31. ME 7XX Advances in Material Removal Processes
32. EN 601 Non-Conventional Energy Sources
33. EN 604 Fuel Cells
34. EN 613 Nuclear Reactor Theory
35. EN 615 Wind Energy Conversion Systems
36. EN 616 Direct Energy Conversion
37. EN 618 Energy Systems Modeling and Analysis
38. EN 619 Solar Energy for Industrial Process Heat
39. EN 630 Utilization of Solar Energy
40. EN 634 Nuclear Reactor Thermal Hydraulics and Safety
41. EN 640 Solar Photovoltaic: Fundamentals, Technologies and Applications

42. EN 642 Power Generation and Systems Planning
43. IE 601 Deterministic Models of Optimization and Operations Research
44. IE 603 Discrete Event System Simulation
45. IE 611 Introduction to Stochastic Models
46. IE 612 Introduction to Financial Engineering
47. IE 642 Engineering Economic Analysis
48. IE 645 Industrial Scheduling
49. IE 646 Quality Engineering and Management Systems
50. IE 647 Applied Integer Programming
51. IE 651 Inventory Control and Management Systems
52. IE 6XX System Dynamics Modeling and Analysis
53. IE 702 Neural Networks and Fuzzy Systems
54. IE 703 Introduction to Knowledge Based Systems and Applications
55. IE 704 Selected Applications of AI in Operations Research
56. IE 705 Quantitative Methods in Project Management
57. IE 706 Pricing and Revenue Management
58. IE 707 Multi-Player Decision Making Models
59. IE 708 Markov Decision Processes
60. IE 710 O.R Applications in Infrastructure and Service Sectors
61. IE 712 Selected Applications Of Stochastic Models
62. IE 714 Quantitative Models For Supply Chain Management

Dual Degree Electives V to IX

Note: Each student must take courses amounting to **minimum** 30 credits (for honors part of the programme) from the following.

1. ME 356 Mechanization

2. ME 477 Introduction to Optimization
3. ME 613 Finite and Boundary Element Methods
4. ME 601 Stress Analysis
5. ME 604 Robotics
6. ME 710 Vibrations
7. ME 491 Design Project +
8. ME 398 Seminar +

+ Design Project is of 8 credits and Seminar is of 4 credits.

<i>COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree CIM) w.e.f. 2007 BATCH</i>											
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 407	Industrial Engg. and Operations Research	2	1	0	6	ME 316	Kinematics and Dynamics of Machines	2	1	0	6
ME 338	Manufacturing Processes II	2	1	0	6		Dual Degree Elective III	3	0	0	6
HS 301/ HS 303/ HS 305/ HS 307	Philosophy/ Psychology/ Literature/ Sociology	3	0	0	6	ME 714	Computer Integrated Manufacturing	3	0	0	6
	Dual Degree Elective I	3	0	0	6	ES 200 And HS 200	Environmental Studies: Science and Engg And Environmental Studies	3	0	0	3
	Dual Degree Elective II	3	0	0	6			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 214	Fluid Mechanics Lab	0	0	3	3
Total		42			
COURSES FOR HONOR REQUIREMENT					

ME 372	Heat Transfer and Metrology Lab	0	0	3	3
Total		36			
COURSES FOR HONOR REQUIREMENT					

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree CIM) w.e.f. 2007 BATCH

Semester VII					
Course code	Course Name	Credit Structure			
		L	T	P	C
ME 423	Machine Design	2	1	2	8
ME 401	Microprocessors and Automatic Control	2	1	0	6
	Dual Degree Elective IV	3	0	0	6
	Dual Degree Elective V	3	0	0	6
ME 409	Intelligent Manufacturing Systems Lab	0	1.5	3	6
ME 441	Applied Thermodynamics Lab	0	0	3	3
ME 421	Microprocessors and Automatic Control Lab	0	0	3	3
Total		38			
COURSES FOR HONOR REQUIREMENT					
COURSES FOR MINOR REQUIREMENT					

Semester VIII					
Course Code	Course Name	Credit Structure			
		L	T	P	C
	Dual Degree Elective VI	3	0	0	6
	Dual Degree Elective VII	3	0	0	6
	Dual Degree Elective VIII	3	0	0	6
	Dual Degree Elective IX	3	0	0	6
	Dual Degree Elective X	3	0	0	6
	Dual Degree Elective XI	3	0	0	6
Total		36			
COURSES FOR HONOR REQUIREMENT					
COURSES FOR MINOR REQUIREMENT					

COURSE CURRICULUM FOR THE NEW PROGRAMME (Dual Degree CIM) w.e.f. 2007 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
	Dual Degree Elective XII	3	0	0	6	ME 594	Dual Degree Project (Stage II)	0	0	0	42
	Dual Degree Elective XIII	3	0	0	6						
ME 593	Dual Degree Project (Stage I)	0	0	0	30						
Total					42	Total					42
COURSES FOR HONOR REQUIREMENT						COURSES FOR HONOR REQUIREMENT					
COURSES FOR MINOR REQUIREMENT						COURSES FOR MINOR REQUIREMENT					

Important Instructions and List of Electives for Dual Degree CIM

- (i) DD (CIM) program consists of 381 credits including 36 credits for 6 electives for the B.Tech. part, 30 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 3 electives (18 credits) from the elective list I, II and V given below.
- (iii) For the postgraduate level courses each student must take 4 electives (24 credits) from the list of electives X, XI, XII and XIII given below.
- (iv) For 6 B.Tech. electives each student must select 6 courses from the elective list III, IV, VI to IX given below.
- (v) Note the instructions given below.

Dual Degree Electives III, IV, VI, VII, VIII and IX

Each student must take any six courses (for **B.Tech.** electives part of the programme) from the following.

1. ME 342 Analytical Methods in Engineering
2. ME 350 Refrigeration and Airconditioning
3. ME 360 Power plant engineering
4. ME 403 Internal Combustion Engines
5. ME 406 Steam and gas turbines
6. ME 408 Industrial Engg and Operational Research II
7. ME 410/758 Microfluidics
8. ME 415 Computational fluid dynamics and heat transfer
9. ME 445 Fuels and combustion
10. ME 440 Industrial tribology
11. ME 456 Automobile engineering (Transmission)
12. ME 617 Rapid product development
13. ME 623 Cryogenics II

14. ME 662 Convective heat and mass transfer
15. ME 663 Advanced heat transfer
16. ME 665 Conduction and radiation heat transfer
17. ME 669 Design for Manufacturing
18. ME 676 Collaborative engineering
19. ME 678 Fundamentals of gas dynamics
20. ME 681 Thermal environment engineering
21. ME 683 Cryogenic I
22. ME 684 Air-conditioning system design
23. ME 724 Essentials of Turbulence
24. ME 730 Ultra Precision Machining
25. ME 732 Selected application of AI and OR in manufacturing systems
26. ME 750 Sheet metal engineering
27. ME 756 Numerical modeling of manufacturing processes
28. ME 7XX Casting Design and Simulation
29. ME 7XX Science and Technology of Welding
30. ME 7XX Analysis of Metal Forming Processes
31. ME 7XX Advances in Material Removal Processes
32. EN 601 Non-conventional Energy Sources
33. EN 604 Fuel Cells
34. EN 613 Nuclear reactor theory
35. EN 615 Wind energy conversion systems
36. EN 616 Direct Energy Conversion
37. EN 618 Energy Systems Modeling and Analysis
38. EN 619 Solar Energy for Industrial Process Heat

39. EN 630 Utilization of solar energy
40. EN 634 Nuclear reactor thermal hydraulics and safety
41. EN 640 Solar Photovoltaic: Fundamentals, Technologies & Applications
42. EN 642 Power Generation and Systems Planning
43. IE 601 Deterministic Models of Optimization and Operations Research
44. IE 603 Discrete Event System Simulation
45. IE 611 Introduction to Stochastic Models
46. IE 612 Introduction to Financial Engineering
47. IE 642 Engineering Economic Analysis
48. IE 645 Industrial Scheduling
49. IE 646 Quality Engineering and Management Systems
50. IE 647 Applied Integer Programming
51. IE 651 Inventory Control and Management Systems
52. IE 6XX System Dynamics modeling and Analysis
53. IE 702 Neural Network, Fuzzy Systems and Applications
54. IE 703 Introduction to Knowledge Based Systems and Applications
55. IE 704 Selected Applications of AI in Operations Research
56. IE 705 Quantitative Methods in Project Management
57. IE 706 Pricing and Revenue Management
58. IE 707 Multi-Player Decision Making Models
59. IE 708 Markov Decision Processes
60. IE 710 O.R Applications in Infrastructure & Service Sectors
61. IE 712 Selected Applications of Stochastic Models
62. IE 714 Quantitative Models for Supply Chain Management

Dual Degree Electives I, II, V, XII and XIII

Each student must take any 5 courses ensuring that at least 2 courses are selected from each of the following two groups.

Manufacturing Courses

1. ME 613 Finite and Boundary Element Methods
2. ME 617 Rapid Product Development
3. ME 637 Manufacturing Automation
4. ME 735 Computer Graphics and Product Modeling
5. ME 645 MEMS Design, Manufacture and Characterisation
- 6. ME 669 Design for Manufacturing**
7. ME 7XX Casting Design and Simulation
8. ME 7XX Science and Technology of Welding
9. ME 7XX Analysis of Metal Forming Processes
10. ME 7XX Advances in Material Removal Processes

Industrial Engineering and Operations Research Courses

1. ME 711 Manufacturing Planning and Control
2. IE 647 Applications of Integer Programming
3. IE 611 Introduction Stochastic Modeling
4. IE 601 Deterministic Models of Optimization and O.R.
5. IE 603 Discrete Event Systems Simulation
6. IE 635 Facilities Planning
7. IE 641 Network flow models and Integration
8. IE 645 Industrial Scheduling
9. IE 651 Inventory planning and management

10. IE 703 Knowledge based systems and applications
11. IE705 Quantitative methods in Project Management
12. IE 707 Multi-player Decision Making Models

Dual Degree Electives X and XI

Each student must take any 2 courses ensuring that at least 1 is selected from each of the following two groups.

Manufacturing Courses

1. ME 642 Advanced Tool Design
2. ME 636 Advanced Joining Technology
3. ME 676 Collaborative Engineering
4. ME 712 Computer Numerical Control and Programming
5. ME 728 Intelligent Product Design and Manufacturing
6. ME 730 Ultra-precision Machining
7. ME 750 Sheet Metal Engineering
8. ME 756 Numerical Modeling of Manufacturing Processes

Industrial Engineering and Operations Research Courses

1. ME 408 Industrial Engineering and Operations Research – II
2. ME 732 Selected Applications of O.R. &AI in Manufacturing systems
3. IE 602 Service Engineering & Management
4. IE 604 System Dynamics : Modeling and Analysis
5. IE 612 Introduction to Financial Engineering
6. IE 646 Quality Engineering and Management
7. IE 648 Quantitative Analysis of Finance and Marketing

8. IE 702 Neural Network & Fuzzy System
9. IE 704 Selected Topics in AI for Operations Research
10. IE 706 Pricing and Revenue Management
11. IE 708 Markov Decision Processes
12. IE 710 O.R Applications in Infrastructure & Service Sectors
13. IE 712 Selected Applications of Stochastic Models
14. IE 714 Supply Chain Management