

## Mechanical FE Exam Class Syllabus (165 Hours)

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Section 1 - Mathematics	Classwork (Videos & Problems)			Hours
	1	Video 1 - Mathematics Introduction (4 minutes)		0.07
	2	Video 2 - (A) Analytic Geometry Lecture (13 minutes)		0.22
	3	Video 3 - (A) Analytic Geometry Practice Problem 1 (6 minutes)		0.10
	4	Video 4 - (A) Analytic Geometry Practice Problem 2 (2 minutes)		0.25
	5	Video 5 - (A) Analytic Geometry Practice Problem 3 (3 minutes)		0.05
	6	Video 6 - (A) Analytic Geometry Practice Problem 4 (2 minutes)		0.03
	7	Video 7 - (A) Analytic Geometry Practice Problem 5 (3 minutes)		0.05
	8	Video 8 - (B) Calculus Lecture (13 minutes)		0.22
	9	Video 9 - (B) Calculus Practice Problem 1 (4 minutes)		0.07
	10	Video 10 - (B) Calculus Practice Problem 2 (6 minutes)		0.10
	11	Video 11 - (B) Calculus Practice Problem 3 (10 minutes)		0.17
	12	Video 12 - (C) Ordinary Differential Equations Lecture (17 minutes)		0.28
	13	Video 13 - (C) Ordinary Differential Equations - Laplace Transform Lecture (6 minutes)		0.10
	14	Video 14 - (C) Ordinary Differential Equations - Practice Problem 1 (2 minutes)		0.03
	15	Video 15 - (C) Ordinary Differential Equations - Practice Problem 2 (4 minutes)		0.07
	16	Video 16 - (C) Ordinary Differential Equations - Practice Problem 3 (3 minutes)		0.05
	17	Video 17 - (D) Linear Algebra Lecture (18 minutes)		0.30
	18	Video 18 - (D) Linear Algebra Practice Problem 1 (6 minutes)		0.10
	19	Video 19 - (D) Linear Algebra Practice Problem 2 (7 minutes)		0.12
	20	Video 20 - (E) Numerical Methods Lecture Part 1 (19 minutes)		0.32
	21	Video 21 - (E) Numerical Methods Lecture Part 2 (13 minutes)		0.22
	22	Video 22 - (E) Numerical Methods Practice Problem 1 (3 minutes)		0.05
	23	Video 23 - (E) Numerical Methods Practice Problem 2 (5 minutes)		0.08
	24	Video 24 - (F) Algorithm and Logic Development Lecture (23 minutes)		0.38
<b>Homework (Reading and Practice Problems)</b>			Hours	
1	Read Mathematics chapter	Hard/Soft Copy Textbook	3.00	
2	Complete all Mathematics practice exam problems	Hard/Soft Copy Textbook	2.00	
<b>Total:</b>			<b>8.42</b>	

Section 2 - Probability & Statistics				
Section 2 - Probability & Statistics	<b>Classwork (Videos &amp; Problem)</b>			Hours
	1	Video 1 - Probability & Statistics Introduction (5 minutes)		0.08
	2	Video 2 - (A) Probability Distributions - Introduction (3 minutes)		0.05
	3	Video 3 - (A) Probability Distributions - Binomial Distribution Lecture (12 minutes)		0.20
	4	Video 4 - (A) Probability Distributions - Binomial Distribution Practice Exam Problem (8 minutes)		0.25
	5	Video 5 - (A) Probability Distributions - Normal Distribution Lecture (7 minutes)		0.12
	6	Video 6 - (A) Probability Distributions - Normal Distribution Practice Exam Problem (9 minutes)		0.15
	7	Video 7 - (A) Probability Distributions - T Distribution Lecture (10 minutes)		0.17
	8	Video 8 - (A) Probability Distributions - T Distribution Practice Exam Problem (5 minutes)		0.08
	9	Video 9 - (A) Probability Distributions - X2 Distribution Lecture (5 minutes)		0.08
	10	Video 10 - (A) Probability Distributions - X2 Distribution Practice Exam Problem (12 minutes)		0.20
	11	Video 11 - (B) Central Tendencies and Dispersions - Lecture (15 minutes)		0.25
	12	Video 12 - (B) Central Tendencies and Dispersions - Std Dev. and Variance Practice Problem (4 minutes)		0.07
	13	Video 13 - (B) Central Tendencies and Dispersions - Avg and Geo. Mean Practice Problem (2 minutes)		0.03
	14	Video 14 - (B) Central Tendencies and Dispersions - Mode, Median, Mean Practice Problem (5 minutes)		0.08
	15	Video 15 - (C) Expected Value- Lecture (9 minutes)		0.15
	16	Video 16 - (C) Expected Value- Probability Table Practice Exam Problem (3 minutes)		0.05
	17	Video 17 - (C) Expected Value- Probability Binomial Practice Exam Problem (2 minutes)		0.03
	18	Video 18 - (D) Regression - Lecture (14 minutes)		0.23
	19	Video 19 - (D) Regression - Practice Exam Problem (8 minutes)		0.13
	<b>Homework (Reading and Practice Problems)</b>			Hours
1	Read Probability & Statistics chapter	Hard/Soft Copy Textbook	3.00	
2	Complete all Probability & Statistics practice exam problems	Hard/Soft Copy Textbook	2.00	
		<b>Total:</b>	<b>7.42</b>	

Section 3 - Ethics & Professional Practice				
Section 3 - Ethics & Professional Practice	Classwork (Videos & Problem)			Hours
	1	Video 1 - Ethics and Professional Practice - Introduction (8 minutes)		0.13
	2	Video 2 - (A) Codes of Ethics Lecture (19 minutes)		0.32
	3	Video 3 - (A) Codes of Ethics Practice Problem 1 (6 minutes)		0.10
	4	Video 4 - (A) Codes of Ethics Practice Problem 2 (6 minutes)		0.25
	5	Video 5 - (B) Public Safety, Health and Welfare Lecture (6 minutes)		0.10
	6	Video 6 - (B) Public Safety, Health and Welfare Practice Problem 1 (4 minutes)		0.07
	7	Video 7 - (B) Public Safety, Health and Welfare Practice Problem 2 (4 minutes)		0.07
	8	Video 8 - (C) Intellectual Property Lecture (15 minutes)		0.25
	9	Video 9 - (C) Intellectual Property Practice Problem 1 (4 minutes)		0.07
	10	Video 10 - (C) Intellectual Property Practice Problem 2 (2 minutes)		0.03
	11	Video 11 - (C) Intellectual Property Practice Problem 3 (3 minutes)		0.05
	12	Video 12 - (D) Societal Consideration Lecture (6 minutes)		0.10
Homework (Reading and Practice Problems)			Hours	
1	Read Ethics & Professional Practice chapter	Hard/Soft Copy Textbook	2.00	
2	Complete all Ethics & Professional Practice practice exam problems	Hard/Soft Copy Textbook	1.00	
		<b>Total:</b>	<b>4.53</b>	
Section 4 - Engineering Economics				
Section 4 - Engineering Economics	Classwork (Videos & Problem)			Hours
	1	Video 1 - Engineering Economics - Introduction (2 minutes)		0.03
	2	Video 2 - (A) Time Value of Money - Lecture (16 minutes)		0.27
	3	Video 3 - (A) Time Value Practice Problem 1 (5 minutes)		0.08
	4	Video 4 - (A) Time Value Practice Problem 2 (4 minutes)		0.25
	5	Video 5 - (A) Time Value Practice Problem 3 (6 minutes)		0.10
	6	Video 6 - (B) Cost Types & Breakdowns - Lecture (9 minutes)		0.15
	7	Video 7 - (B) Cost Types & Breakdowns - Problem 1 Sunk and Variable Costs (5 minutes)		0.08
	8	Video 8 - (B) Cost Types & Breakdowns - Practice Problem 2 Incremental Costs (5 minutes)		0.08
	9	Video 9 - (B) Cost Types & Breakdowns - Practice Problem 3 Average Costs (2 minutes)		0.03
	10	Video 10 - (C) Economic Analyses - Lecture (21 minutes)		0.35
	11	Video 11 - (C) Economic Analyses - Problem 1 Life Cycle Cost (2 minutes)		0.03
	12	Video 12 - (C) Economic Analyses - Problem 2 Simple Payback (2 minutes)		0.03
	13	Video 13 - (C) Economic Analyses - Problem 3 Capitalized Costs (2 minutes)		0.03
	14	Video 14 - (C) Economic Analyses - Problem 4 Straight Line Depreciation (4 minutes)		0.07
	15	Video 15 - (C) Economic Analyses - Problem 5 MACRS Depreciation (5 minutes)		0.08
	Homework (Reading and Practice Problems)			Hours
	1	Read Engineering Economics chapter	Hard/Soft Copy Textbook	4.00
2	Complete all Engineering Economics practice exam problems	Hard/Soft Copy Textbook	2.00	
		<b>Total:</b>	<b>7.68</b>	



Classwork (Videos & Problem)			
			Hours
1	Video 1 - Statics - Introduction (6 minutes)		0.10
2	Video 2 - (A) Resultants of Force Systems - Lecture (9 minutes)		0.15
3	Video 3 - (A) Resultants of Force Systems -Practice Problem 1 (7 minutes)		0.12
4	Video 4 - (A) Resultants of Force Systems -Practice Problem 2 (2 minutes)		0.25
5	Video 5 - (A) Resultants of Force Systems -Practice Problem 3 (8 minutes)		0.13
6	Video 6 - (A) Resultants of Force Systems -Practice Problem 4 (6 minutes)		0.10
7	Video 7 - (B) Concurrent Force Systems (3 minutes)		0.05
8	Video 8 - (B) Concurrent Force Systems - Practice Problem 1 (2 minutes)		0.03
9	Video 9 - (B) Concurrent Force Systems - Practice Problem 2 (5 minutes)		0.08
10	Video 10 - (C) Equilibrium of Rigid Bodies (7 minutes)		0.12
11	Video 11 - (C) Equilibrium of Rigid Bodies - Practice Problem 1 (3 minutes)		0.05
12	Video 12 - (C) Equilibrium of Rigid Bodies - Practice Problem 2 (3 minutes)		0.05
13	Video 13 - (C) Equilibrium of Rigid Bodies - Practice Problem 3 (3 minutes)		0.05
14	Video 14 - (D) Trusses and Frames (30 minutes)		0.50
15	Video 15 - (D) Trusses and Frames - Practice Problem 1 (5 minutes)		0.08
16	Video 16 - (D) Trusses and Frames - Practice Problem 2 (3 minutes)		0.05
17	Video 17 - (D) Trusses and Frames - Practice Problem 3 (2 minutes)		0.03
18	Video 18 - (E) Centroids and Moment of Area (8 minutes)		0.13
19	Video 19 - (E) Area Moment of Inertia (12 minutes)		0.20
20	Video 20 - (E) Product of Inertia and Parallel Axis (8 minutes)		0.13
21	Video 21 - (E) Centroids and Moments of Inertia - Practice Problem 1 (9 minutes)		0.15
22	Video 22 - (E) Centroids and Moments of Inertia - Practice Problem 2 (8 minutes)		0.13
23	Video 23 - (F) Static Friction (13 minutes)		0.22
24	Video 24 - (F) Static Friction - Practice Problem 1 (7 minutes)		0.12
25	Video 25 - (F) Static Friction - Practice Problem 2 (4 minutes)		0.07
26	Video 26 - (F) Static Friction - Practice Problem 3 (3 minutes)		0.05
Homework (Reading and Practice Problems)			Hours
1	Read Statics chapter	Hard/Soft Copy Textbook	6.00
2	Complete all Statics practice problems	Hard/Soft Copy Textbook	3.00
		<b>Total:</b>	<b>12.15</b>

**Section 6 - Statics**

Section 7 - Dynamics, Kinematics & Vibrations			
<b>Classwork (Videos &amp; Problem)</b>			Hours
1	Video 1 - Dynamics, Kinematics & Vibrations - Introduction (4 minutes)		0.07
2	Video 2 - (A & F) Kinematics of Particles and Rigid Bodies (12 minutes)		0.20
3	Video 3 - (A & F) Kinematics of Particles and Rigid Bodies - Practice Problem 1 (4 minutes)		0.07
4	Video 4 - (A & F) Kinematics of Particles and Rigid Bodies - Practice Problem 2 (6 minutes)		0.25
5	Video 5 - (A & F) Kinematics of Particles and Rigid Bodies - Practice Problem 3 (4 minutes)		0.07
6	Video 6 - (A & F) Kinematics of Particles and Rigid Bodies - Practice Problem 4 (3 minutes)		0.05
7	Video 7 - (A & F) Kinematics of Particles and Rigid Bodies - Practice Problem 5 (5 minutes)		0.08
8	Video 8 - (A & F) Kinematics of Particles and Rigid Bodies - Practice Problem 6 (7 minutes)		0.12
9	Video 9 - (B) Kinetic Friction (12 minutes)		0.20
10	Video 10 - (B) Kinetic Friction - Practice Problem 1 (4 minutes)		0.07
11	Video 11 - (B) Kinetic Friction - Practice Problem 2 (7 minutes)		0.12
12	Video 12 - (B) Kinetic Friction - Practice Problem 3 (5 minutes)		0.08
13	Video 13 - (C & H) Newton's 2nd Law for Particles and Rigid Bodies (14 minutes)		0.23
14	Video 14 - (C & H) Newton's 2nd Law for Particles and Rigid Bodies - Practice Problem 1 (3 minutes)		0.05
15	Video 15 - (D & I) Work-Energy of Particles and Rigid Bodies (10 minutes)		0.17
16	Video 16 - (D & I) Work-Energy of Particles and Rigid Bodies - Practice Problem 1 (5 minutes)		0.08
17	Video 17 - (D & I) Work-Energy of Particles and Rigid Bodies - Practice Problem 2 (6 minutes)		0.10
18	Video 18 - (D & I) Work-Energy of Particles and Rigid Bodies - Practice Problem 3 (7 minutes)		0.12
19	Video 19 - (E & J) Impulse-Momentum of Particles and Rigid Bodies (10 minutes)		0.17
20	Video 20 - (E & J) Impulse-Momentum of Part. and Rigid Bodies - Practice Problem 1 (3 minutes)		0.05
21	Video 21 - (E & J) Impulse-Momentum of Part. and Rigid Bodies - Practice Problem 2 (11 minutes)		0.18
22	Video 22 - (G) Kinematics of Mechanisms (19 minutes)		0.32
23	Video 23 - (G) Kinematics of Mechanisms - Practice Problem 1 (9 minutes)		0.15
24	Video 24 - (G) Kinematics of Mechanisms - Practice Problem 2 (3 minutes)		0.05
25	Video 25 - (K) Free and Forced Vibrations (21 minutes)		0.35
26	Video 26 - (K) Free and Forced Vibrations - Practice Problem 1 (5 minutes)		0.08
27	Video 27 - (K) Free and Forced Vibrations - Practice Problem 2 (6 minutes)		0.10
<b>Homework (Reading and Practice Problems)</b>			Hours
1	Read Dynamics, Kinematics and Vibrations chapter	Hard/Soft Copy Textbook	6.00
2	Complete all Dynamics, Kinematics and Vibrations practice problems	Hard/Soft Copy Textbook	3.00
		<b>Total:</b>	<b>12.57</b>

## Section 8 - Mechanics of Materials

<b>Classwork (Videos &amp; Problem)</b>			Hours
1	Video 1 - Mechanics of Materials - Introduction (6 minutes)		0.10
2	Video 2 - (A) Shear and Moment Diagrams (16 minutes)		0.27
3	Video 3 - (A) Shear and Moment Diagrams - Practice Problem 1 (7 minutes)		0.12
4	Video 4 - (A) Shear and Moment Diagrams - Practice Problem 2 (6 minutes)		0.25
5	Video 5 - (A) Shear and Moment Diagrams - Practice Problem 3 (5 minutes)		0.08
6	Video 6 - (A) Shear and Moment Diagrams - Practice Problem 4 (6 minutes)		0.10
7	Video 7 - (B) Stress Transformations and Mohr's Circle (8 minutes)		0.13
8	Video 8 - (B) Stress Transformations and Mohr's Circle - Practice Problem 1 (5 minutes)		0.08
9	Video 9 - (B) Stress Transformations and Mohr's Circle - Practice Problem 2 (3 minutes)		0.05
10	Video 10 - (C) Stress and Strain caused by Axial Loads (6 minutes)		0.10
11	Video 11 - (C) Stress and Strain caused by Axial Loads - Practice Problem 1 (7 minutes)		0.12
12	Video 12 - (C) Stress and Strain caused by Axial Loads - Practice Problem 2 (8 minutes)		0.13
13	Video 13 - (D) Stress and Strain caused by Bending Loads (5 minutes)		0.08
14	Video 14 - (D) Stress and Strain caused by Bending Loads - Practice Problem 1 (3 minutes)		0.05
15	Video 15 - (D) Stress and Strain caused by Bending Loads - Practice Problem 2 (4 minutes)		0.07
16	Video 16 - (D) Stress and Strain caused by Bending Loads - Practice Problem 3 (10 minutes)		0.17
17	Video 17 - (E) Stress and Strain caused by Torsional Loads (5 minutes)		0.08
18	Video 18 - (E) Stress and Strain caused by Torsional Loads - Practice Problem 1 (5 minutes)		0.08
19	Video 19 - (E) Stress and Strain caused by Torsional Loads - Practice Problem 2 (4 minutes)		0.07
20	Video 20 - (F) Stress and Strain caused by Shear (5 minutes)		0.08
21	Video 21 - (F) Stress and Strain caused by Shear - Practice Problem 1 (8 minutes)		0.13
22	Video 22 - (F) Stress and Strain caused by Shear - Practice Problem 2 (12 minutes)		0.20
23	Video 23 - (G) Stress and Strain caused by Temperature Changes (4 minutes)		0.07
24	Video 24 - (G) Stress and Strain caused by Temperature Changes - Practice Problem 1 (4 minutes)		0.07
25	Video 25 - (G) Stress and Strain caused by Temperature Changes - Practice Problem 2 (4 minutes)		0.07
26	Video 26 - (H) Combined Loading (2 minutes)		0.03
27	Video 27 - (I) Deformations (9 minutes)		0.15
28	Video 28 - (I) Deformations - Practice Problem 1 (5 minutes)		0.08
29	Video 29 - (I) Deformations - Practice Problem 2 (4 minutes)		0.07
30	Video 30 - (J) Column Buckling (9 minutes)		0.15
31	Video 31 - (J) Column Buckling - Practice Problem 1 (7 minutes)		0.12
32	Video 32 - (K) Statically Indeterminate Systems (3 minutes)		0.05
33	Video 33 - (K) Statically Indeterminate Systems - Practice Problem 1 (3 minutes)		0.05
34	Video 34 - (K) Statically Indeterminate Systems - Practice Problem 2 (4 minutes)		0.07
<b>Homework (Reading and Practice Problems)</b>			Hours
1	Read Mechanics of Materials chapter	Hard/Soft Copy Textbook	6.00
2	Complete all Mechanics of Materials practice exam problems	Hard/Soft Copy Textbook	3.00
		<b>Total:</b>	<b>12.52</b>

## Section 9 - Material Properties & Processing

<b>Classwork (Videos &amp; Problem)</b>			Hours
1	Video 1 - Material Properties and Processing - Introduction (4 minutes)		0.07
2	Video 2 - (A) Properties (24 minutes)		0.40
3	Video 3 - (A) Properties - Practice Problem 1 (8 minutes)		0.13
4	Video 4 - (A) Properties - Practice Problem 2 (5 minutes)		0.08
5	Video 5 - (A) Properties - Practice Problem 3 (5 minutes)		0.08
6	Video 6 - (B) Stress-Strain Diagrams (13 minutes)		0.22
7	Video 7 - (B) Stress-Strain Diagrams - Practice Problem 1 (3 minutes)		0.05
8	Video 8 - (B) Stress-Strain Diagrams - Practice Problem 2 (4 minutes)		0.07
9	Video 9 - (C) Ferrous Metals (10 minutes)		0.17
10	Video 10 - (C) Ferrous Metals - Practice Problem 1 (4 minutes)		0.07
11	Video 11 - (D) Non-Ferrous Metals (7 minutes)		0.12
12	Video 12 - (D) Non-Ferrous Metals - Practice Problem 1 (3 minutes)		0.05
13	Video 13 - (D) Non-Ferrous Metals - Practice Problem 2 (2 minutes)		0.03
14	Video 14 - (E) Engineered Materials (6 minutes)		0.10
15	Video 15 - (E) Engineered Materials - Practice Problem 1 (3 minutes)		0.05
16	Video 16 - (E) Engineered Materials - Practice Problem 2 (2 minutes)		0.25
17	Video 17 - (F) Manufacturing Processes (9 minutes)		0.15
18	Video 18 - (F) Manufacturing Processes - Practice Problem 1 (1 minutes)		0.02
19	Video 19 - (F) Manufacturing Processes - Practice Problem 2 (3 minutes)		0.05
20	Video 20 - (F) Manufacturing Processes - Practice Problem 3 (3 minutes)		0.05
21	Video 21 - (G) Phase Diagrams, Phase Transformation and Heat Treating (16 minutes)		0.27
22	Video 22 - (G) Phase Diagrams, Phase Transformation and Heat Treating - Practice Problem 1 (3 min)		0.05
23	Video 23 - (G) Phase Diagrams, Phase Transformation and Heat Treating - Practice Problem 2 (6 min)		0.10
24	Video 24 - (H) Materials Selection (1 minute)		0.02
25	Video 25 - (I) Corrosion Mechanisms and Control (10 minutes)		0.17
26	Video 26 - (I) Corrosion Mechanisms and Control - Practice Problem 1 (1 minutes)		0.02
27	Video 27 - (I) Corrosion Mechanisms and Control - Practice Problem 2 (10 minutes)		0.17
28	Video 28 - (I) Corrosion Mechanisms and Control - Practice Problem 3 (1 minutes)		0.02
29	Video 29 - (J) Failure Mechanisms (14 minutes)		0.23
30	Video 30 - (J) Failure Mechanisms - Practice Problem 1 (4 minutes)		0.07
31	Video 31 - (J) Failure Mechanisms - Practice Problem 2 (2 minutes)		0.03
32	Video 32 - (J) Failure Mechanisms - Practice Problem 3 (6 minutes)		0.10
<b>Homework (Reading and Practice Problems)</b>			Hours
1	Read Material Properties & Processing chapter	Hard/Soft Copy Textbook	6.00
2	Complete all Material Properties & Processing practice problems	Hard/Soft Copy Textbook	3.00
		<b>Total:</b>	<b>12.43</b>



## Section 10 - Fluid Mechanics

Classwork (Videos & Problem)			Hours
1	Video 1 - Fluid Mechanics - Introduction (6 minutes)		0.10
2	Video 2 - (A) Fluid Properties (13 minutes)		0.22
3	Video 3 - (A) Fluid Properties - Practice Exam Problem 1 (6 minutes)		0.10
4	Video 4 - (A) Fluid Properties - Practice Exam Problem 2 (6 minutes)		0.10
5	Video 5 - (A) Fluid Properties - Practice Exam Problem 3 (4 minutes)		0.07
6	Video 6 - (B) Fluid Statics (18 minutes)		0.30
7	Video 7 - (B) Fluid Statics - Practice Exam Problem 1 (8 minutes)		0.13
8	Video 8 - (B) Fluid Statics - Practice Exam Problem 2 (9 minutes)		0.15
9	Video 9 - (B) Fluid Statics - Practice Exam Problem 3 (6 minutes)		0.10
10	Video 10 - (C) Energy, Impulse and Momentum (11 minutes)		0.18
11	Video 11 - (C) Energy, Impulse and Momentum - Practice Problem 1 (10 minutes)		0.17
12	Video 12 - (C) Energy, Impulse and Momentum - Practice Problem 2 (7 minutes)		0.12
13	Video 13 - (C) Energy, Impulse and Momentum - Practice Problem 3 (11 minutes)		0.18
14	Video 14 - (D) Internal Flow - Darcy Equation (13 minutes)		0.22
15	Video 15 - (D) Internal Flow - Hazen Williams Equation (6 minutes)		0.10
16	Video 16 - (D) Internal Flow - Fluid Flow Measurement (10 minutes)		0.17
17	Video 17 - (D) Internal Flow -Practice Problem 1 (6 minutes)		0.10
18	Video 18 - (D) Internal Flow -Practice Problem 2 (7 minutes)		0.12
19	Video 19 - (D) Internal Flow -Practice Problem 3 (6 minutes)		0.10
20	Video 20 - (D) Internal Flow -Practice Problem 4 (6 minutes)		0.10
21	Video 21 - (E) External Flow (12 minutes)		0.20
22	Video 22 - (E) External Flow - Practice Problem 1 (8 minutes)		0.13
23	Video 23 - (E) External Flow - Practice Problem 2 (9 minutes)		0.15
24	Video 24 - (E) External Flow - Practice Problem 3 (1 minutes)		0.02
25	Video 25 - (F) Compressibility (7 minutes)		0.12
26	Video 26 - (F) Compressibility - Practice Problem 1 (5 minutes)		0.08
27	Video 27 - (F) Compressibility - Practice Problem 2 (8 minutes)		0.13
28	Video 28 - (F) Compressibility - Practice Problem 3 (4 minutes)		0.07
29	Video 29 - (G) Power and Efficiency (8 minutes)		0.13
30	Video 30 - (G) Power and Efficiency - Practice Problem 1 (11 minutes)		0.18
31	Video 31 - (G) Power and Efficiency - Practice Problem 2 (6 minutes)		0.10
32	Video 32 - (G) Power and Efficiency - Practice Problem 3 (6 minutes)		0.10
33	Video 33 - (H) Performance Curves (11 minutes)		0.18
34	Video 34 - (H) Performance Curves - Practice Problem 1 (8 minutes)		0.13
35	Video 35 - (H) Performance Curves - Practice Problem 2 (3 minutes)		0.25
36	Video 36 - (H) Performance Curves - Practice Problem 3 (9 minutes)		0.15
37	Video 37 - (H) Performance Curves - Practice Problem 4 (4 minutes)		0.07
38	Video 38 - (I) Scaling and Affinity Laws (12 minutes)		0.20
39	Video 39 - (I) Scaling and Affinity Laws - Practice Problem 1 (3 minutes)		0.05
40	Video 40 - (I) Scaling and Affinity Laws - Practice Problem 2 (2 minutes)		0.03
41	Video 41 - (I) Scaling and Affinity Laws - Practice Problem 3 (3 minutes)		0.05
Homework (Reading and Practice Problems)			Hours
1	Read Fluid Mechanics chapter	Hard/Soft Copy Textbook	7.00
2	Complete all Fluid Mechanics practice exam problems	Hard/Soft Copy Textbook	4.00
<b>Total:</b>			<b>16.35</b>

## Section 11 - Thermodynamics

<b>Classwork (Videos &amp; Problem)</b>			Hours
1	Video 1 - Thermodynamics - Introduction (6 minutes)		0.10
2	Video 2 - (A) Properties of Ideal Gases and Pure Substances (19 minutes)		0.32
3	Video 3 - (A) Properties of Ideal Gases and Pure Substances - Practice Exam Problem 1 (6 minutes)		0.10
4	Video 4 - (A) Properties of Ideal Gases and Pure Substances - Practice Exam Problem 2 (5 minutes)		0.08
5	Video 5 - (A) Properties of Ideal Gases and Pure Substances - Practice Exam Problem 3 (7 minutes)		0.12
6	Video 6 - (B) Energy Transfers (11 minutes)		0.18
7	Video 7 - (B) Energy Transfers - Practice Exam Problem 1 (4 minutes)		0.07
8	Video 8 - (B) Energy Transfers - Practice Exam Problem 2 (3 minutes)		0.05
9	Video 9 - (B) Energy Transfers - Practice Exam Problem 3 (3 minutes)		0.05
10	Video 10 - (C) Laws of Thermodynamics (4 minutes).mp4		0.07
11	Video 11 - (C) Laws of Thermodynamics - Practice Exam Problem 1 (12 minutes)		0.20
12	Video 12 - (C) Laws of Thermodynamics - Practice Exam Problem 2 (10 minutes)		0.17
13	Video 13 - (C) Laws of Thermodynamics - Practice Exam Problem 3 (11 minutes)		0.18
14	Video 14 - (D) Processes (12 minutes)		0.20
15	Video 15 - (D) Processes - Practice Problem 1 (11 minutes)		0.18
16	Video 16 - (D) Processes - Practice Problem 2 (8 minutes)		0.13
17	Video 17 - (D) Processes - Practice Problem 3 (5 minutes)		0.08
18	Video 18 - (E) Performance of Components (5 minutes)		0.08
19	Video 19 - (E) Performance of Components - Practice Problem 1 (2 minutes)		0.03
20	Video 20 - (G) Power Cycles - Otto Cycle (9 minutes)		0.15
21	Video 21 - (G) Power Cycles - Rankine Cycle (9 minutes)		0.15
22	Video 22 - (G) Power Cycles - Practice Problem 1 Rankine Cycle (13 minutes)		0.22
23	Video 23 - (G) Power Cycles - Practice Problem 2 Otto Cycle (12 minutes)		0.20
24	Video 24 - (G) Refrigeration and Heat Pump Cycles - Part 1 (8 minutes)		0.13
25	Video 25 - (G) Refrigeration and Heat Pump Cycles - Part 2 (14 minutes)		0.23
26	Video 26 - (G) Refrigeration and Heat Pump Cycles - Practice Problem 1 (12 minutes)		0.20
27	Video 27 - (G) Refrigeration and Heat Pump Cycles - Practice Problem 2 (7 minutes)		0.12
28	Video 28 - (H) Nonreacting Mixtures of Gases (17 minutes)		0.28
29	Video 29 - (H) Nonreacting Mixtures of Gases - Practice Problem 1 (3 minutes)		0.05
30	Video 30 - (H) Nonreacting Mixtures of Gases - Practice Problem 2 (6 minutes)		0.10
31	Video 31 - (H) Nonreacting Mixtures of Gases - Practice Problem 3 (5 minutes)		0.08
32	Video 32 - (I) Psychrometrics (20 minutes)		0.33
33	Video 33 - (I) Psychrometrics - Practice Exam Problem 1 (10 minutes)		0.17
34	Video 34 - (I) Psychrometrics - Practice Exam Problem 2 (6 minutes)		0.10
35	Video 35 - (I) Psychrometrics - Practice Exam Problem 3 (5 minutes)		0.08
36	Video 36 - (J) HVAC Processes (14 minutes)		0.23
37	Video 37 - (J) HVAC Processes - Practice Problem 1 (4 minutes)		0.07
38	Video 38 - (J) HVAC Processes - Practice Problem 2 (4 minutes)		0.07
39	Video 39 - (J) HVAC Processes - Practice Problem 3 (3 minutes)		0.05
40	Video 40 - (J) HVAC Processes - Summary Recap (5 minutes)		0.08
41	Video 41 - (K) Combustion and Combustion Products (11 minutes)		0.18
42	Video 42 - (K) Combustion and Combustion Products - Practice Exam Problem 1 (5 minutes)		0.08
43	Video 43 - (K) Combustion and Combustion Products - Practice Exam Problem 2 (4 minutes)		0.07
<b>Homework (Reading and Practice Problems)</b>			Hours
1	Read Thermodynamics chapter	Hard/Soft Copy Textbook	8.00
2	Complete all Thermodynamics practice exam problems	Hard/Soft Copy Textbook	5.00
<b>Total:</b>			<b>18.83</b>

Section 12 - Heat Transfer				
Section 12 - Heat Transfer	<b>Classwork (Videos &amp; Problem)</b>			Hours
	1	Video 1 - Heat Transfer Introduction (3 minutes)		0.05
	2	Video 2 - (A) Conduction (17 minutes)		0.28
	3	Video 3 - (A) Conduction - Practice Problem 1 (8 minutes)		0.13
	4	Video 4 - (A) Conduction - Practice Problem 2 (10 minutes)		0.17
	5	Video 5 - (A) Conduction - Practice Problem 3 (4 minutes)		0.07
	6	Video 6 - (B) Convection (11 minutes)		0.18
	7	Video 7 - (B) Convection - Practice Problem 1 (6 minutes)		0.10
	8	Video 8 - (B) Convection - Practice Problem 2 (5 minutes)		0.08
	9	Video 9 - (B) Convection - Practice Problem 3 (7 minutes)		0.12
	10	Video 10 - (C) Radiation (14 minutes)		0.23
	11	Video 11 - (C) Radiation - Practice Problem 1 (4 minutes)		0.07
	12	Video 12 - (C) Radiation - Practice Problem 2 (8 minutes)		0.13
	13	Video 13 - (C) Radiation - Practice Problem 3 (6 minutes)		0.10
	14	Video 14 - (D) Transient Processes (7 minutes)		0.12
	15	Video 15 - (D) Transient Processes - Practice Problem 1 (6 minutes)		0.10
	16	Video 16 - (D) Transient Processes - Practice Problem 2 (6 minutes)		0.10
	17	Video 17 - (E) Heat Exchangers (17 minutes)		0.28
	18	Video 18 - (E) Heat Exchangers - Practice Problem 1 (6 minutes)		0.10
	19	Video 19 - (E) Heat Exchangers - Practice Problem 2 (5 minutes)		0.08
	20	Video 20 - (E) Heat Exchangers - Practice Problem 3 (4 minutes)		0.07
	21	Video 21 - (E) Heat Exchangers - Practice Problem 4 (8 minutes)		0.13
	<b>Homework (Reading and Practice Problems)</b>			Hours
	1	Read Heat Transfer chapter	Hard/Soft Copy Textbook	4.00
	2	Complete all Heat Transfer practice problems	Hard/Soft Copy Textbook	2.00
			<b>Total:</b>	<b>8.70</b>

<b>Section 13 - Measurements, Instrumentation &amp; Controls</b>		<b>Classwork (Videos &amp; Problem)</b>		Hours
		1	Video 1 - Measurements, Instrumentation & Controls - Introduction (3 minutes)	
2	Video 2 - (A) Sensors and Transducers (13 minutes)		0.22	
3	Video 3 - (A) Sensors and Transducers - Practice Problem 1 (4 minutes)		0.07	
4	Video 4 - (A) Sensors and Transducers - Practice Problem 2 (3 minutes)		0.25	
5	Video 5 - (A) Sensors and Transducers - Practice Problem 3 (4 minutes)		0.07	
6	Video 6 - (A) Sensors and Transducers - Practice Problem 4 (2 minutes)		0.03	
7	Video 7 - (B) Control Systems (7 minutes)		0.12	
8	Video 8 - (B) Control Systems - Practice Problem 1 (3 minutes)		0.05	
9	Video 9 - (B) Control Systems - Practice Problem 2 (3 minutes)		0.05	
10	Video 10 - (B) Control Systems - Practice Problem 3 (3 minutes)		0.05	
11	Video 11 - (C) Dynamic System Response (11 minutes)		0.18	
12	Video 12 - (C) Dynamic System Response - Practice Problem 1 (4 minutes)		0.07	
13	Video 13 - (C) Dynamic System Response - Practice Problem 2 (3 minutes)		0.05	
14	Video 14 - (C) Dynamic System Response - Practice Problem 3 (4 minutes)		0.07	
15	Video 15 - (D) Measurement Uncertainty (11 minutes)		0.18	
16	Video 16 - (D) Measurement Uncertainty - Practice Problem 1 (3 minutes)		0.05	
17	Video 17 - (D) Measurement Uncertainty - Practice Problem 2 (4 minutes)		0.07	
18	Video 18 - (D) Measurement Uncertainty - Practice Problem 3 (6 minutes)		0.10	
		<b>Homework (Reading and Practice Problems)</b>		Hours
1	Read Measurements, Instrumentation & Controls chapter	Hard/Soft Copy Textbook	4.00	
2	Complete all Measurements, Instrumentation & Controls practice problems	Hard/Soft Copy Textbook	2.00	
		<b>Total:</b>	<b>7.72</b>	

## Section 14 - Mechanical Design & Analysis

<b>Classwork (Videos &amp; Problem)</b>		<b>Hours</b>
1	Video 1 - Mechanical Design and Analysis - Introduction (3 minutes)	0.05
2	Video 2 - (A) Stress Analysis of Machine Elements (3 minutes)	0.05
3	Video 3 - (B) Failure Theories and Analysis (14 minutes)	0.23
4	Video 4 - (B) Failure Theories and Analysis - Practice Problem 1 (9 minutes)	0.15
5	Video 5 - (B) Failure Theories and Analysis - Practice Problem 2 (6 minutes)	0.10
6	Video 6 - (B) Failure Theories and Analysis - Practice Problem 3 (6 minutes)	0.10
7	Video 7 - (C) Deformation and Stiffness (1 minutes)	0.02
8	Video 8 - (C) Deformation and Stiffness - Practice Problem 1 (2 minutes)	0.03
9	Video 9 - (C) Deformation and Stiffness - Practice Problem 2 (4 minutes)	0.07
10	Video 10 - (C) Deformation and Stiffness - Practice Problem 3 (4 minutes)	0.07
11	Video 11 - (D) Springs (11 minutes)	0.18
12	Video 12 - (D) Springs - Practice Problem 1 (4 minutes)	0.07
13	Video 13 - (D) Springs - Practice Problem 2 (3 minutes)	0.05
14	Video 14 - (D) Springs - Practice Problem 3 (8 minutes)	0.13
15	Video 15 - (D) Springs - Practice Problem 4 (9 minutes)	0.15
16	Video 16 - (E) Pressure Vessels and Piping (9 minutes)	0.15
17	Video 17 - (E) Pressure Vessels and Piping - Practice Problem 1 (9 minutes)	0.15
18	Video 18 - (E) Pressure Vessels and Piping - Practice Problem 2 (3 minutes)	0.05
19	Video 19 - (E) Pressure Vessels and Piping - Practice Problem 3 (3 minutes)	0.05
20	Video 20 - (F) Bearings (9 minutes)	0.15
21	Video 21 - (F) Bearings - Practice Problem 1 (6 minutes)	0.10
22	Video 22 - (F) Bearings - Practice Problem 2 (3 minutes)	0.05
23	Video 23 - (F) Bearings - Practice Problem 3 (3 minutes)	0.05
24	Video 24 - (G) Power Screws (10 minutes)	0.17
25	Video 25 - (G) Power Screws - Practice Problem 1 (4 minutes)	0.07
26	Video 26 - (G) Power Screws - Practice Problem 2 (2 minutes)	0.03
27	Video 27 - (G) Power Screws - Practice Problem 3 (6 minutes)	0.10
28	Video 28 - (H) Power Transmission (14 minutes)	0.23
29	Video 29 - (H) Power Transmission - Practice Problem 1 (5 minutes)	0.08
30	Video 30 - (H) Power Transmission - Practice Problem 2 (5 minutes)	0.08
31	Video 31 - (H) Power Transmission - Practice Problem 3 (6 minutes)	0.10
32	Video 32 - (I) Joining Methods (20 minutes)	0.25
33	Video 33 - (I) Joining Methods - Practice Problem 1 (7 minutes)	0.12
34	Video 34 - (I) Joining Methods - Practice Problem 2 (8 minutes)	0.13
35	Video 35 - (I) Joining Methods - Practice Problem 3 (4 minutes)	0.07
36	Video 36 - (J) Manufacturability (15 minutes)	0.25
37	Video 37 - (J) Manufacturability - Practice Problem 1 (5 minutes)	0.08
38	Video 38 - (J) Manufacturability - Practice Problem 2 (4 minutes)	0.07
39	Video 39 - (J) Manufacturability - Practice Problem 3 (5 minutes)	0.08
40	Video 40 - (K) Quality and Reliability (14 minutes)	0.23
41	Video 41 - (K) Quality and Reliability - Practice Problem 1 (5 minutes)	0.08
42	Video 42 - (K) Quality and Reliability - Practice Problem 2 (2 minutes)	0.03
43	Video 43 - (K) Quality and Reliability - Practice Problem 3 (5 minutes)	0.08
44	Video 44 - (L) Components (9 minutes)	0.15
45	Video 45 - (L) Components - Practice Problem 1 (4 minutes)	0.07
46	Video 46 - (L) Components - Practice Problem 2 (6 minutes)	0.10
47	Video 47 - (L) Components - Practice Problem 3 (3 minutes)	0.05

<b>Homework (Reading and Practice Problems)</b>			Hours
1	Read Mechanical Design & Analysis chapter	Hard/Soft Copy Textbook	8.00
2	Complete all Mechanical Design & Analysis practice problems	Hard/Soft Copy Textbook	5.00
		<b>Total:</b>	<b>17.92</b>
<b>Complete Final Mechanical FE Exam</b>			Hours
1	Complete Final Mechanical FE Exam		5.50
2	Check solutions	Solutions released after you submit your answers.	3.00
		<b>Total:</b>	<b>8.50</b>