

**A Study Guide for the
Professional Engineering Exam**

**Mechanical: Thermal & Fluids Systems
April 2016**

**By: Joshua Thompson, PE
IslandStart.com**

Purpose: this study guide here to help you visualize one of the difficult parts in preparing for your professional engineering exam. It's intended to accompany my blog post found here:

<https://www.islandstart.com/pe-exam-study-plan>

What's Included:

1. **Timeline:** this is the timeline of events that took place when I registered for the exam, enrolled in a prep course, received my exam authorization, took the test, and received my notification of passing. Not everything went smoothly during this process and this is why I include it.
2. **Plan:** This is where I took my purchased reference material, counted all the pages and questions, then re-arranged the material to put the important information closest to my test date. This also gave me an opportunity to decide on the color code scheme for tabbing each unit of information. A lot of judgement went into how many hours to devote to each chapter. It was primarily developed from the NCEES specification for my exam. Additional consideration was given for how many pages and questions were devoted to each section.
3. **Log:** I used this log as a practical means of recording my progress. To prevent the inevitable procrastination that comes with getting on the computer, I printed the log to have at my desk for study. I would write in each date that I completed an hour worth of study. There are 300 blocks to log hours. An individual may elect to study for more or less time depending on their personal preferences and abilities.

Acknowledgement

This plan uses information (unit & chapter descriptions) derived from the following texts:

Lindeburg, M. R. (2013) **Mechanical Engineering Reference Manual for the PE Exam Thirteenth Edition**. Belmont, CA: Professional Publications, Inc.
Lindeburg, M. R. (2013) **Practice Problems for the Mechanical Engineering PE Exam Thirteenth Edition**. Belmont, CA: Professional Publications, Inc.

PE Exam Timeline

Date	Event
5/4/2015	Submit application package
6/16/2015	Received email from DPOR requesting more info
6/17/2015	Obtained more info and put in mail
6/22/2015	Application receipt deadline
6/23/2015	NCEES registration begins
8/28/2015	Called DPOR, they held application in error and will submit to board
9/3/2015	Turned down: more experience description req'd
10/16/2015	Mailed revised experience forms
11/12/2015	Notified that I can take exam
12/7/2015	VA DPOR Registration Deadline
12/8/2015	NCEES registration window opens
12/13/2015	Submitted EdAssist Program Request for review course
12/21/2015	EdAssist rejected, ODU not prepared to host course anyway
12/31/2015	NCEES registered
2/17/2016	NCEES registration window closes tomorrow
3/30/2016	Exam authorization notice delivered via email
4/15/2016	Exam Day
5/23/2016	Email notification PASS, certificate should arrive by mail within 30 days

PE Exam Study Plan

2016 Mechanical: Thermal-Fluids

O #	Unit	Chapter	Pages	Questions	Hours	
1	1 Support	1 Systems of Units	10	3	1	9/4/2015
2		3 Algebra	13	4	1	9/4/2015
3		4 Linear Algebra	8	2	1	9/5/2015
4		5 Vectors	5	2	1	9/5/2015
5		6 Trigonometry	6	3	1	9/5/2015
6		7 Analytic Geometry	12	4	1	9/6/2015
7		8 Differential Calculus	8	4	1	9/6/2015
8		9 Integral Calculus	8	6	1	9/7/2015
9		10 Differential Equations	10	5	1	9/7/2015
10		11 Probability and Statistical Analysis of Data	18	22	1	9/8/2015
11		12 Numbering Systems	4	6	1	9/8/2015
12		13 Numerical Analysis	4	4	1	9/9/2015
13		61 Modeling of Engineering Systems	9	8	1	9/9/2015
14		62 Analysis of Engineering Systems	15	3	1	9/9/2015
15		64 Instrumentation and Measurements	14	22	1	9/10/2015
16		66 Materials Handling and Processing	19	13	1	9/10/2015
17		67 Fire Protection Sprinkler Systems	21	19	1	9/11/2015
18		68 Pollutants in the Environment	22	7	1	9/11/2015
19		69 Storage and Disposition of Hazardous Materials	2	5	1	9/11/2015
20		70 Testing and Sampling	6	0	1	9/12/2015
21		71 Environmental Remediation	26	10	1	9/12/2015
22		73 Illumination and Sound	13	12	1	9/12/2015
23		75 Professional Services, Contracts, and Engineering Law	8	29	1	9/13/2015
24		76 Engineering Ethics	4	18	1	9/13/2015
25		65 Manufacturing Processes	14	9	2	9/13/2015
26		2 Engineering Drawing Practice	5	27	3	9/15/2015
27		63 Management Science	36	7	5	9/18/2015
28		72 Electricity and Electrical Equipment	18	13	5	9/19/2015
29	14 Engineering Economic Analysis	74 Engineering Economic Analysis	45	48	13	9/29/2015
30	10 Engineering Materials and Statics	45 Determinate Statics	23	12	4	10/4/2015
31		46 Indeterminate Statics	14	18	5	10/13/2015
32		47 Engineering Materials	21	2	2	10/14/2015
33		48 Material Properties and Testing	17	9	2	10/20/2015

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O #	Unit	Chapter	Pages	Questions	Hours	
34		49 Thermal Treatment of Metals	10	2	1	10/21/2015
35	11 Mechanics of Materials	50 Properties of Areas	8	6	2	10/22/2015
36		51 Strength of Materials	21	16	5	10/26/2015
37	12 Machine Design	52 Failure Theories	8	5	1	10/26/2015
38		53 Basic Machine Design	20	18	4	10/29/2015
39		54 Advanced Machine Design	26	40	7	11/8/2015
40		55 Pressure Vessels	21	26	5	11/14/2015
41	13 Kinematics of Machinery	56 Properties of Solid Bodies	2	4	1	11/14/2015
42		57 Kinematics	15	17	5	11/18/2015
43		58 Kinetics	21	25	7	11/23/2015
44		59 Mechanisms and Power Transmission Systems	18	13	3	11/25/2015
45		60 Vibrating Systems	21	11	2	11/26/2015
46	8 HVAC	38 Psychrometrics	12	14	6	11/29/2015
47		39 Cooling Towers and Fluid Coolers	3	6	1	11/29/2015
48		40 Ventilation	11	9	5	12/3/2015
49	9 Fans and Ductwork	41 Fans, Ductwork, and Terminal Devices	32	13	10	12/8/2015
50		42 Heating Load	7	8	4	12/10/2015
51		43 Cooling Load	10	5	4	12/13/2015
52		44 Air Conditioning Systems and Controls	7	12	2	12/13/2015
53	3 Fuels and Combustion	20 Inorganic Chemistry	24	7	6	12/17/2015
54		21 Fuels and Combustion	19	19	10	12/30/2015
55	2 Fluids and Hydraulic Machines	14 Fluid Properties	16	5	5	1/1/2016
56		15 Fluid Statics	19	3	5	1/24/2016
57		16 Fluid Flow Parameters	14	3	4	2/10/2016
58		17 Fluid Dynamics	47	37	16	2/15/2016
59		18 Hydraulic Machines and Fluid Distribution	24	25	13	2/20/2016
60		19 Hydraulic and Pneumatic Systems	12	22	12	2/25/2016
61	4 Energy and Thermodynamic Properties	22 Energy, Work, and Power	6	8	5	2/28/2016
62		23 Thermodynamic Properties of Substances	22	7	6	3/1/2016
63		24 Changes in Thermodynamic Properties	13	12	6	3/4/2016
64	5 Compressible Fluid Dynamics	25 Compressible Fluid Dynamics	22	15	9	3/5/2016
65	6 Power Cycles	26 Vapor Power Equipment	17	16	8	3/6/2016
66		27 Vapor Power Cycles	8	7	4	3/7/2016

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67		28 Reciprocating Combustion Engine Cycles	14	9	5	3/13/2016
68		29 Combustion Turbine Cycles	11	5	4	3/15/2016
69		30 Nuclear Power Cycles	3	12	1	3/16/2016
70		31 Advanced and Alternative Power-Generating Systems	11	19	8	3/19/2016
71		32 Gas Compression Cycles	9	5	3	3/20/2016
72		33 Refrigeration Cycles	10	8	5	3/20/2016
73	7 Heat Transfer and Convection	34 Fundamental Heat Transfer	23	12	7	3/23/2016
74		35 Natural Convection, Evaporation, and Condensation	12	5	4	3/25/2016
75		36 Forced Convection and Heat Exchangers	24	19	10	3/27/2016
76		37 Radiation and Combined Heat Transfer	7	7	4	3/31/2016
			Sum		300	

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