

THE NATIONAL COUNCIL OF EXAMINERS FOR ENGINEERING AND SURVEYING
PRINCIPLES AND PRACTICE OF ENGINEERING EXAMINATION

MECHANICAL
(Depth – Machine Design)

EFFECTIVE October 2001

The mechanical engineering examination is a breadth and depth examination. This means that **all** examinees work the breadth (AM) exam and **one** of the three depth (PM) exams. The three areas covered in the mechanical engineering examination are HVAC and Refrigeration, Machine Design, and Thermal and Fluids Systems. The breadth exam contains questions from these three areas of mechanical engineering. The depth exams focus more closely on a single area of practice in mechanical engineering.

	Approximate Percentage of <u>Examination</u>
Machine Design Depth Module (PM)	
I. Engineering Principles	43%
1. Materials Properties & Selection	
2. Strength of Materials	
3. Fatigue Theory	
4. Vibration Analysis	
5. Statics and Dynamics	
6. Stress Analysis	
7. Kinematics	
II. Components	36%
1. Bearings	
2. Gears	
3. Springs	
4. Shafts	
5. Fasteners	
III. Applications	21%
A. Systems Applications	13%
1. Economic Analyses	
2. Pressure Vessels	
3. Structural Analysis	
4. Mechanism Analysis	
5. Codes and Standards (ASTM, ANSI, ASME)	
B. Supportive Knowledges	8%
1. Fluid Mechanics	
2. Heat and Mass Transfer Principles	
3. Thermodynamics	
a. Properties	
b. Cycles	

Approximate
Percentage of
Examination

4. Energy Balances
5. Project Management
6. Welding
7. Fits & Tolerances
8. Manufacturing Processes
9. Quality Control

TOTAL **100%**

NOTES:

1. The knowledge areas specified as A, B, C, ... etc., are examples of kinds of knowledge, but they are not exclusive or exhaustive categories.
2. Each depth (PM) exam contains 40 multiple-choice questions. Examinee chooses **one** depth exam and works all questions in the depth exam chosen.