

Principles and Practice of Engineering (PE) Subject Matter Report by Major and Examination Jan 01 – Jun 30, 2022 First-Time Examinees from EAC/ABET-Accredited Engineering Programs Examinees testing more than 12 months after graduation date

Name of Institution:		University of Kentucky, Lexington					
Major:	Agricultural	PE Examination: Civil: Water Resources and Environmental					
			Institution	ABET			

	Institution	Comparator ²	
No. Examinees Taking ¹	3	15	
No. Examinees Passing	1	8	
Percent Examinees Passing	33%	53%	

	Number of Exam Questions	Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	$\begin{array}{c} \text{Uncertainty}\\ \text{Range for}\\ \text{Scaled}\\ \pm 0.58\\ \end{array}$
Hydraulics–Closed Conduit	4	8.8	9.2	2.5	0.96	-0.16
Hydraulics–Open Channel	4	7.7	11.4	3.5	0.68	-1.06
Hydrology	6	9.1	10.3	3.0	0.88	-0.40
Groundwater and Wells	3	11.0	10.3	3.0	1.07	0.23
Wastewater Collection and Treatment	5	10.1	9.0	2.3	1.12	0.48
Water Quality	3	7.4	10.8	3.6	0.69	-0.94
Drinking Water Distribution and Treatment	5	8.1	9.7	2.3	0.84	-0.70
Engineering Economics Analysis	1	5.0	9.0	7.3	0.56	-0.55

<u>0</u> examinees have been removed from this data because they were flagged as a random guesser.
Comparator includes all examinees from programs accredited by the ABET commission noted.
Performance index is based on a 0–15 scale.

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TERMS AND CONDITIONS OF DATA USE



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Name of Institution:		University of Kentucky, Lexington			
Major:	Civil	PE Examination:	Civil: Construction		
			ABET 2		

	Institution	Comparator ²	
No. Examinees Taking ¹	6	497	
No. Examinees Passing	2	256	
Percent Examinees Passing	33%	52%	

	Number of Exam Questions	Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Range for Scaled Score 4 ± 0.41 Scaled Score 4
Estimating Quantities and Costs	5	9.6	9.0	3.2	1.07	0.19
Construction Operations and Methods	6	7.7	8.9	2.5	0.87	-0.48
Scheduling	5	7.9	9.3	3.3	0.85	-0.42
Material Quality Control and Production	5	9.5	9.4	3.0	1.01	0.03
Temporary Structures	6	7.9	8.9	2.2	0.89	-0.45
Health and Safety	3	10.6	10.5	4.0	1.01	0.02

Uncertainty

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Name of Institution: University of Kentucky, Lexington			of Kentucky, Lexington
Major:	Civil	PE Examination:	Civil: Geotechnical
			ABET

	Institution	Comparator ²
No. Examinees Taking ¹	2	235
No. Examinees Passing	0	120
Percent Examinees Passing	0%	51%

	Number of Exam Questions	Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Range for Scaled Score 4 ± 0.71 Scaled Score 4
Soil Mechanics, Laboratory Testing, and Analysis	4	11.5	10.3	3.8	1.12	0.32
Field Materials Testing, Methods, and Safety	3	8.7	9.4	4.4	0.93	-0.16
Earthquake Engineering and Dynamic Loads	2	4.3	9.3	5.3	0.46	-0.94
Earth Structures	4	8.2	9.8	3.9	0.84	-0.41
Groundwater and Seepage	3	4.7	9.3	4.1	0.51	-1.12
Problematic Soil and Rock Conditions	3	3.2	9.1	4.2	0.35	-1.40
Earth Retaining Structures (ASD or LRFD)	4	11.7	8.4	3.4	1.39	0.97
Shallow Foundations (ASD or LRFD)	4	7.8	9.3	3.7	0.84	-0.41
Deep Foundations (ASD or LRFD)	4	9.9	9.7	3.5	1.02	0.06

Uncertainty

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No. Examinees Passing

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Name of Institution:		University of Kentucky, Lexington				
Major:	Civil	PE Examination:	Civil: Structural			
			Institution	ABET Comparator ²		
No. Examinees Taking ¹			6	810		

Percent Examinees Passing	Number of Exam Questions	50% Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Uncertainty Range for Scaled ± 0.41 Scaled Score ⁴
Analysis of Structures: Loads and load applications	4	6.8	9.0	3.3	0.76	-0.67
Analysis of Structures: Forces and load effects	9	8.6	8.6	2.1	1.00	0.00
Analysis of Structures: Forces and load effects Design and Details of Structures: Materials and material properties	9 4	8.6 8.8	8.6 10.0	2.1 3.6	1.00 0.88	0.00 -0.33
Design and Details of Structures: Materials and material properties	4	8.8	10.0	3.6	0.88	-0.33

3

467

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No. Examinees Passing

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Name of Institution:	University of Kentucky, Lexington			
Major:	Civil	PE Examination:	Civil: Transport	ation
			Institution	ABET Comparator ²
No. Examinees Taking ¹			12	1,189

Percent Examinees Passing	Number of Exam Questions	67% Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Uncertainty Range for Scaled ± 0.29 Scaled Score ⁴
Horizontal Design	3	8.4	9.0	4.5	0.93	-0.13
Vertical Design	3	9.8	10.5	4.4	0.93	-0.16
Intersection Geometry	3	8.2	10.0	4.1	0.82	-0.44
Roadside and Cross-Section Design	3	11.9	10.4	3.7	1.14	0.41
Signal Design	3	8.8	9.9	4.0	0.89	-0.28
Traffic Control Design	3	13.4	12.0	3.8	1.12	0.37
Geotechnical and Pavement	4	9.6	10.3	3.2	0.93	-0.22
Drainage	2	11.7	11.4	4.7	1.03	0.06
Alternatives Analysis	1	11.3	10.0	7.1	1.13	0.18

8

796

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Name of Institution: University of Kentucky, Lexington					
Major: Civil PE Examination:			Civil: Water Resources and Environmental		

	Institution	ABET Comparator ²
No. Examinees Taking ¹	5	917
No. Examinees Passing	4	599
Percent Examinees Passing	80%	65%

	Number of Exam Questions	Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Uncertainty Range for Scaled ± 0.45 Scaled Score ⁴
Hydraulics–Closed Conduit	4	8.4	9.1	3.3	0.92	-0.21
Hydraulics–Open Channel	4	10.8	10.6	3.4	1.02	0.06
Hydrology	6	8.8	9.6	2.8	0.92	-0.29
Groundwater and Wells	3	9.7	10.5	3.9	0.92	-0.21
Wastewater Collection and Treatment	5	8.6	9.2	2.8	0.93	-0.21
Water Quality	3	10.3	9.6	4.1	1.07	0.17
Drinking Water Distribution and Treatment	5	9.0	9.4	2.9	0.96	-0.14
Engineering Economics Analysis	1	9.0	9.2	7.3	0.98	-0.03

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Performance index is based on a 0–15 scale.

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Name of Institution:	University of Kentucky, Lexington						
Major:	Electrical	PE Examination: Electrical and Computer: Power					
			Institution ABET				

	Institution	Comparator ²
No. Examinees Taking ¹	4	647
No. Examinees Passing	3	387
Percent Examinees Passing	75%	60%

	Number of Exam Questions	Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Range for Scaled Score 4 ± 0.50 Scaled Score 4
General Power Engineering: Measurement and Instrumentation	4	8.1	10.2	3.4	0.79	-0.62
General Power Engineering: Applications	7	8.6	9.3	2.6	0.92	-0.27
General Power Engineering: Codes and Standards	10	9.4	9.6	2.3	0.98	-0.09
Circuits: Analysis	8	8.8	9.2	2.5	0.96	-0.16
Circuits: Devices and Power Electronic Circuits	6	9.1	8.6	2.6	1.06	0.19
Rotating Machines and Electric Power Devices: Induction and Synchronous Machines	7	7.3	9.1	2.7	0.80	-0.67
Rotating Machines and Electric Power Devices: Electric Power Devices	7	7.8	9.3	2.7	0.84	-0.56
Transmission and Distribution (High, Medium, and Low Voltage): Power System Analysis	10	7.7	8.8	1.9	0.88	-0.58
Transmission and Distribution (High, Medium, and Low Voltage): Protection	11	9.4	8.9	1.8	1.06	0.28

Uncertainty

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No. Examinees Passing

Percent Examinees Passing

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Name of Institution:	me of Institution: University of Kentucky, Lexington							
Major:	Mechanical	hanical PE Examination: Mechanical: HVAC and Refrigeration						
			Institution	ABET Comparator ²				
No. Examinees Taking ¹			3	468				

	Number of Exam Questions	Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Uncertainty Range for Scaled ± 0.58 Scaled Score ⁴
Principles: Basic Engineering Practice	4	11.1	9.9	3.7	1.12	0.32
Principles: Thermodynamics	4	10.1	10.1	3.7	1.00	0.00
Principles: Psychrometrics	7	8.2	10.0	3.1	0.82	-0.58
Principles: Heat Transfer	6	11.5	10.4	3.2	1.11	0.34
Principles: Fluid Mechanics	3	13.3	10.0	3.9	1.33	0.85
Principles: Energy/Mass Balances	4	8.1	10.5	3.8	0.77	-0.63
Applications: Heating/Cooling Loads	7	10.1	10.1	3.2	1.00	0.00
Applications: Equipment and Components	16	9.2	9.3	1.8	0.99	-0.06
Applications: Systems and Components	16	10.9	9.5	1.8	1.15	0.78
Applications: Supportive Knowledge	3	10.9	10.0	4.0	1.09	0.23

3

100%

339

72%

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Name of Institution:	University of Kentucky, Lexington					
Major: Mechanical		PE Examination:	Mechanical: Machine Design and Materials			
			ABET			

	Institution	Comparator ²
No. Examinees Taking ¹	1	268
No. Examinees Passing	1	190
Percent Examinees Passing	100%	71%

						Range for Scaled Score ⁴ ± 1.00
	Number of Exam Questions	Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Scaled Score ⁴
Principles: Basic Engineering Practice	7	10.1	9.6	2.6	1.05	0.19
Principles: Engineering Science and Mechanics	9	8.3	9.4	2.3	0.88	-0.48
Principles: Material Properties	7	10.8	9.5	2.6	1.14	0.50
Principles: Strength of Materials	9	9.7	9.6	2.1	1.01	0.05
Principles: Vibration	3	9.4	8.8	4.3	1.07	0.14
Applications: Mechanical Components	16	8.8	9.4	1.8	0.94	-0.33
Applications: Joints and Fasteners	10	15.0	9.5	2.1	1.58	2.62
Applications: Supportive Knowledge	9	9.7	9.6	2.3	1.01	0.04

Uncertainty

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Name of Institution:	University of Kentucky, Lexington						
Major:	Mechanical	PE Examination:	Mechanical: Thermal and Fluid Systems				
			Institution	ABET			

	Institution	Comparator ²
No. Examinees Taking ¹	1	301
No. Examinees Passing	1	206
Percent Examinees Passing	100%	68%

	Number of Exam Questions	Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Uncertainty Range for Scaled Score 4 ± 1.00 Scaled Score 4
Principles: Basic Engineering Practice	5	9.5	9.8	3.1	0.97	-0.10
Principles: Fluid Mechanics	5	8.3	9.3	3.4	0.89	-0.29
Principles: Heat Transfer Principles	5	8.3	10.5	3.3	0.79	-0.67
Principles: Mass Balance Principles	4	6.9	9.8	3.8	0.70	-0.76
Principles: Thermodynamics	5	10.3	9.7	3.1	1.06	0.19
Principles: Supportive Knowledge	4	9.2	10.1	3.5	0.91	-0.26
Hydraulic and Fluid Applications: Distribution Systems	8	9.1	9.3	2.4	0.98	-0.08
Hydraulic and Fluid Applications: Hydraulic and Fluid Equipment	13	9.6	9.3	1.9	1.03	0.16
Energy/Power System Applications: Energy/Power Equipment	7	15.0	9.6	2.7	1.56	2.00
Energy/Power System Applications: Cooling/Heating	5	15.0	10.0	2.9	1.50	1.72
Energy/Power System Applications: Energy Recovery	5	8.4	10.2	3.7	0.82	-0.49
Energy Tower System Applications. Energy necovery	5	0.4	10.2	0.7	0.01	0.10

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Name of Institution:	University of Kentucky, Lexington			
Major:	Mining/Mineral	PE Examination:	Civil: Geotechnical	
No. Examinees Taking ¹			Institution	ABET Comparator ² 3

Percent Examinees Passing	Number of Exam Questions	100% Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Uncertainty Range for Scaled Score ⁴ ± 1.00 Scaled Score ⁴
Soil Mechanics, Laboratory Testing, and Analysis	4	15.0	10.3	3.4	1.46	1.38
Field Materials Testing, Methods, and Safety	3	15.0	13.1	2.6	1.15	0.73
Earthquake Engineering and Dynamic Loads	2	15.0	12.5	3.5	1.20	0.71
Earth Structures	4	6.5	7.3	0.6	0.89	-1.33
Groundwater and Seepage	3	9.1	10.8	3.0	0.84	-0.57
Problematic Soil and Rock Conditions	3	8.5	6.8	1.2	1.25	1.42
Earth Retaining Structures (ASD or LRFD)	4	9.8	10.3	0.3	0.95	-1.67
Shallow Foundations (ASD or LRFD)	4	8.7	10.9	2.9	0.80	-0.76
Deep Foundations (ASD or LRFD)	4	10.0	10.2	0.2	0.98	-1.00

1

3

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Name of Institution:		University of Kentue	University of Kentucky, Lexington				
Major:	Mining/Mineral	PE Examination:	Civil: Transportation				
			Institution	ABET Comparator ²			
No. Examinees Taking ¹			2	2			
No. Examinees Passing			2	2			
Percent Examinees Passing			100%	100%			

	Number of Exam Questions	Institution Average Performance Index ³	ABET Comparator Average Performance Index	ABET Comparator Standard Deviation	Ratio Score ⁴	Range for Scaled Score 4 ± 0.71 Scaled Score 4
Horizontal Design	3	8.6	8.6	0.1	1.00	0.00
Vertical Design	3	7.4	7.4	0.9	1.00	0.00
Intersection Geometry	3	11.5	11.5	3.6	1.00	0.00
Roadside and Cross-Section Design	3	8.1	8.1	0.4	1.00	0.00
Signal Design	3	12.0	12.0	3.1	1.00	0.00
Traffic Control Design	3	15.0	15.0	0.0	1.00	-
Geotechnical and Pavement	4	8.3	8.3	0.2	1.00	0.00
Drainage	2	10.6	10.6	4.4	1.00	0.00
Alternatives Analysis	1	7.5	7.5	7.5	1.00	0.00

Uncertainty

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