

End of Course (EOC) Bank Blueprints

Manufacturing Operations

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THE OHIO STATE UNIVERSITY
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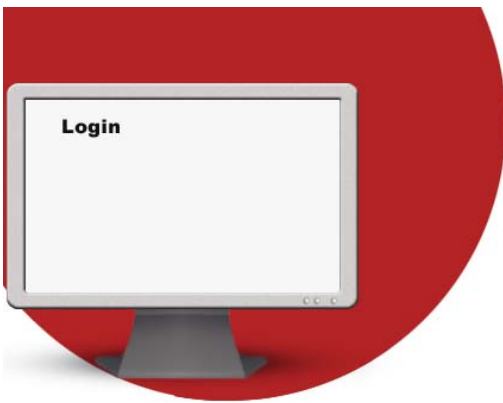
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About Test Blueprints

Test blueprints are created to provide guidance to Subject Matter Experts (SMEs) during the item writing phase of test development. In addition, we believe that they can assist those instructors who did not participate in item writing (and administrators) to understand the broad content of the item bank. Items are formally allocated across a course outline in a three-step process*:

1. CETE psychometricians use a formula which assumes that all competencies within a course outline are *essential* and of equal importance to produce a suggested test blueprint for review by Ohio Department of Education program specialists and SMEs.
2. SMEs review the blueprint as a large group before item writing for a specific EOC test. There and in small groups, SMEs review the course outline and have the ability to make changes to the blueprint with a documented rationale based on their experience and expertise.
3. Any revisions during small group work must be approved by the larger panel of SMEs attending an item writing workshop, which is the last step and produces the final blueprint which is summarized in this document.



Test blueprints can provide high-level guidance to instructors on preparing students for testing. It is important to keep in mind that the blueprint is a tool that is used when developing the test item bank during initial item writing and test creation. As with all tests, the End-of-Course test forms are a sample of the item bank.

Interpreting the Blueprints

Test blueprints display the total number of test items SMEs planned to write to a particular *outcome* (as designated in the course outline created by the Ohio Department of Education Office of Career-Technical Education or by a vendor). Blueprints describe the structure of the item bank which is the total pool of test items created. Final test forms of 40-items are created from the item bank.

*This newer process for producing test blueprints was implemented October 1, 2015. Item banks created prior to this date were completed under a different blueprint process and therefore we are looking backward to provide the structure of the item bank. As revisions are completed for those career fields, for example Information Technology (2017-18), the blueprint process used will be the newer model.

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Gas Metal Arc Welding

ODE Subject Code: 176000

Outcome #	Outcome Name	% Items In Bank
Strand 4. Materials Joining		
4.1.	Physics of Welding	19.10
4.2.	Physics of Welding	6.74
4.3.	Arc Welding Processes	51.69
4.6.	Thermal Cutting	5.62
Strand 5. Pre-Engineering: Design and Development		
5.2.	Sketching and Visualization	11.24
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	5.62



Shielded Metal Arc Welding

ODE Subject Code: 176001

Outcome #	Outcome Name	% Items In Bank
Strand 4. Materials Joining		
4.1.	Physics of Welding	9.41
4.2.	Physics of Welding	5.88
4.3.	Arc Welding Processes	40.00
4.6.	Thermal Cutting	22.35
Strand 5. Pre-Engineering: Design and Development		
5.2.	Sketching and Visualization	5.88
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	16.47



Flux Cored Arc Welding

ODE Subject Code: 176002

Outcome #	Outcome Name	% Items In Bank
Strand 4. Materials Joining		
4.1.	Physics of Welding	4.65
4.2.	Physics of Welding	11.63
4.3.	Arc Welding Processes	37.21
Strand 5. Pre-Engineering: Design and Development		
5.2.	Sketching and Visualization	8.14
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	38.37



Gas Tungsten Arc Welding

ODE Subject Code: 176003

Outcome #	Outcome Name	% Items In Bank
Strand 4. Materials Joining		
4.1.	Physics of Welding	11.63
4.2.	Physics of Welding	8.14
4.3.	Arc Welding Processes	39.53
4.5.	Testing and Inspection	10.47
Strand 5. Pre-Engineering: Design and Development		
5.2.	Sketching and Visualization	15.12
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	15.12



Machine Tools

ODE Subject Code: 176004

Outcome #	Outcome Name	% Items In Bank
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	17.65
6.2	Layout and Planning	28.24
6.3.	Cutting	14.12
6.4.	Drilling	11.76
6.7.	Grinding	10.59
6.8.	Maintenance	17.65



Machining with Industrial Lathes

ODE Subject Code: 176005

Outcome #	Outcome Name	% Items In Bank
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	21.18
6.2	Layout and Planning	20.00
6.3.	Cutting	7.06
6.4.	Drilling	4.71
6.5.	Turning	35.29
6.7.	Grinding	4.71
6.8.	Maintenance	7.06



Machining with Industrial Milling Machines

ODE Subject Code: 176006

Outcome #	Outcome Name	% Items In Bank
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	18.99
6.2	Layout and Planning	12.66
6.3.	Cutting	15.19
6.4.	Drilling	10.13
6.6.	Milling	15.19
6.7.	Grinding	13.92
6.8.	Maintenance	13.92



Computer Numerical Control Technology with Industrial Mills and Lathes

ODE Subject Code: 176007

Outcome #	Outcome Name	% Items In Bank
Strand 3. Computer Integrated Manufacturing		
3.1.	Computer Numerical Control (CNC)	19.10
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	5.62
6.8.	Maintenance	



Welding Technologies

ODE Subject Code: 176009

Outcome #	Outcome Name	% Items In Bank
Strand 1. Business Operations/21st Century Skills		
1.1.	Employability Skills	9.89
1.2.	Leadership and Communications	6.59
1.3.	Business Ethics and Law	4.40
Strand 4. Materials Joining		
4.1.	Physics of Welding	13.19
4.2.	Metallurgy of Welding	3.30
4.3.	Arc Welding Processes	6.59
4.4.	Non-Arc Welding Process	2.20
4.5.	Testing and Inspection	4.40
4.6.	Thermal Cutting	6.59
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	6.59
6.2.	Layout and Planning	4.40
6.3.	Cutting	6.59
6.8.	Maintenance	5.49
Strand 7. Safety, Tools and Equipment		
7.1.	Site Safety	8.79
7.2.	Personal Safety	10.99



Manufacturing Operations

ODE Subject Code: 175003

Outcome #	Outcome Name	% Items In Bank
Strand 1. Business Operations/21st Century Skills		
1.1.	Employability Skills	2.20
1.2.	Leadership and Communications	1.10
1.4.	Knowledge Management and Information Technology	1.10
1.5.	Global Environment	3.30
1.6.	Business Literacy	3.30
1.9.	Financial Management	4.40
Strand 2. Electrical/Electronics		
2.1.	Electronic Theory	2.20
2.2.	Circuits	2.20
2.3.	Codes and Regulations	3.30
2.8.	Power Supplies	6.59
Strand 3. Computer Integrated Manufacturing		
3.4.	Power Technologies	10.99
3.5.	Pumping Systems	3.30
3.6.	Transmission Systems	2.20
Strand 5. Pre-Engineering: Design and Development		
5.2.	Sketching and Visualization	9.89
5.5.	Materials	5.49
5.6.	Production and Process Design	3.30
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	5.49
6.2.	Layout and Planning	6.59
6.8.	Maintenance	5.49
Strand 7. Safety, Tools and Equipment		
7.1.	Site Safety	12.09
7.2.	Personal Safety	5.49



Robotics

ODE Subject Code: 175004

Outcome #	Outcome Name	% Items In Bank
Strand 1. Business Operations/21st Century Skills		
1.1.	Employability Skills	1.18
1.2.	Leadership and Communications	1.18
1.3.	Business Ethics and Law	1.18
1.4.	Knowledge Management and Information Technology	1.18
1.5.	Global Environment	1.18
1.6.	Business Literacy	1.18
1.9.	Financial Management	1.18
Strand 2. Electrical/Electronics		
2.1.	Electronic Theory	16.47
2.2.	Circuits	3.53
2.3.	Codes and Regulations	1.18
2.6.	Digital Electronics	4.71
2.7.	Cabling and Wiring	7.06
2.8.	Power Supplies	3.53
2.9.	Motors and Power	1.18
Strand 3. Computer Integrated Manufacturing		
3.2.	Robotics	32.94
3.3.	Programmable Logic Controllers (PLCs)	21.18



Computer Integrated Manufacturing

ODE Subject Code: 175006

Outcome #	Outcome Name	% Items In Bank
Strand 2. Electrical/Electronics		
2.8.	Power Supplies	2.53
2.9.	Motors and Power	7.59
Strand 3. Computer Integrated Manufacturing		
3.1.	Computer Numerical Control (CNC)	21.52
3.2.	Robotics	2.53
3.3.	Programmable Logic Controllers (PLCs)	2.53
Strand 5. Pre-Engineering: Design and Development		
5.1.	The Design Process	5.06
5.2.	Sketching and Visualization	8.86
5.3.	Computer-Aided Modeling	5.06
5.5.	Materials	13.92
5.6.	Production and Process Design	7.59
Strand 6. Precision Machining		
6.1.	Measurement and Interpretation	3.80
6.2.	Layout and Planning	6.33
6.5.	Turning	6.33
6.6.	Milling	3.80
6.8.	Maintenance	2.53



Digital Electronics

ODE Subject Code: 175007

Outcome #	Outcome Name	% Items In Bank
Strand 1. Business Operations/21st Century Skills		
1.1.	Employability Skills	6.52
1.2.	Leadership and Communications	2.17
1.3.	Business Ethics and Law	2.17
1.4.	Knowledge Management and Information Technology	1.09
1.5.	Global Environment	1.09
1.6.	Business Literacy	1.09
1.9.	Financial Management	1.09
Strand 2. Electrical/Electronics		
2.1.	Electronic Theory	13.04
2.2.	Circuits	9.78
2.3.	Codes and Regulations	2.17
2.4.	Electronic Components	9.78
2.5.	Electronic Soldering Connections	6.52
2.6.	Digital Electronics	39.13
Strand 5. Pre-Engineering: Design and Development		
5.2.	Sketching and Visualization	4.35



Hydraulics and Pneumatics

ODE Subject Code: 010225

Outcome #	Outcome Name	% Items In Bank
Strand 1. Business Operations/21st Century Skills		
1.1.	Employability Skills	3.42
1.2.	Leadership and Communications	3.42
1.3.	Business Ethics and Law	3.42
1.4.	Knowledge Management and Information Technology	2.56
1.6.	Operations Management	1.71
1.8.	Operations Management	1.71
1.10.	Sales and Marketing	1.71
1.12.	Site and Personal Safety Procedures	17.09
Strand 4. Power Systems		
4.1.	Tool, Stationary and Mobile Equipment Maintenance	9.40
4.2.	Equipment Operations	1.71
4.11.	Hydraulic Systems	47.01
4.12.	Brakes	3.42
Strand 6. Environmental Science		
6.8.	Contaminants and Pollution Control	1.71
6.9.	Hazardous Materials and Waste Management	1.71

