



# End of Course (EOC) Bank Blueprints

# Biotechnology and Food

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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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**Agriculture Food and Natural Resources**  
ODE Subject Code: 010105

Outcome #	Outcome Name	% Items In Bank
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.2.	Leadership and Communications	2.22
1.4.	Knowledge Management and Information Technology	1.11
1.6.	Business Literacy	1.11
1.9.	Financial Management	2.22
1.12.	Site and Personal Safety Procedures	8.89
<b>Strand 2. Animal Science</b>		
2.3.	Care and Management	13.33
<b>Strand 3. Biotechnology</b>		
3.1.	Handling, Preparation, Storage and Disposal	3.33
3.4.	Molecular-Genetics Technology	5.56
3.6.	Culturing	3.33
<b>Strand 4. Power Systems</b>		
4.1.	Tool, Stationary and Mobile Equipment Maintenance	1.11
4.3.	Engines	5.56
<b>Strand 5. Structural Engineering</b>		
5.3.	Design and Estimate	3.33
5.6.	Construction	5.56
5.10.	Joining and Cutting Metals with Heat	3.33
<b>Strand 6. Environmental Science</b>		
6.1.	Soils	11.11
6.2.	Water Quality	3.33
6.11	Habitat Management and Restoration	3.33
<b>Strand 7. Food Sciences</b>		
7.2.	Quality Assurance	3.33
7.5.	Food Product Development	3.33
<b>Strand 8. Plant Science</b>		
8.1.	Plant Nutrition	4.44
8.4.	Growth and Management	5.56
<b>Strand 9. Energy</b>		
9.1.	Energy	5.56



# Food Marketing and Research

ODE Subject Code: 011015

Outcome #	Outcome Name	% Items In Bank
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.2.	Leadership and Communications	16.05
1.3.	Business Ethics and Law	11.11
1.4.	Knowledge Management and Information Technology	2.47
1.5.	Global Environment	8.64
1.6.	Business Literacy	8.64
1.10.	Sales and Marketing	7.41
<b>Strand 3. Biotechnology</b>		
3.8.	Research and Experiments	16.05
<b>Strand 7. Food Sciences</b>		
7.2.	Quality Assurance	7.41
7.4.	Food Production and Processing	6.17
7.5.	Food Product Development	11.11
7.6.	Food Safety and Sanitation	4.94



# Genetics of Plants and Animals

ODE Subject Code: 012020

Outcome #	Outcome Name	% Items In Bank
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.12.	Site and Personal Safety Procedures	10.71
<b>Strand 3. Biotechnology</b>		
3.2.	Foundations of Chemistry	5.95
3.3.	Microbiology Testing and Technology	17.86
3.4.	Molecular-Genetics Technology	44.05
3.5.	Laboratory Standard Operational Procedures	14.29
3.8.	Research and Experiments	7.14



# Science & Technology of Food

ODE Subject Code: 011010

Outcome #	Outcome Name	% Items In Bank
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.3.	Business Ethics and Law	3.61
<b>Strand 3. Biotechnology</b>		
3.2.	Foundations of Chemistry	7.23
3.3.	Microbiology Testing and Technology	4.82
3.5.	Laboratory Standard Operational Procedures	4.82
3.6.	Culturing	3.61
3.8.	Research and Experiments	10.84
<b>Strand 7. Food Sciences</b>		
7.1.	The Science of Food	26.51
7.2.	Quality Assurance	3.61
7.4.	Food Production and Processing	10.84
7.5.	Food Product Development	10.84
7.6.	Food Safety and Sanitation	6.02
7.7.	Biosecurity	7.23



# Animal and Plant Biotechnology

ODE Subject Code: 012010

Outcome #	Outcome Name	% Items In Bank
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.1.	Employability Skills	15.12
1.2.	Leadership and Communications	5.81
1.3.	Business Ethics and Law	3.49
1.4.	Knowledge Management and Information Technology	3.49
1.5.	Global Environment	4.65
1.10.	Sales and Marketing	4.65
1.12.	Site and Personal Safety Procedures	5.81
<b>Strand 3. Biotechnology</b>		
3.2.	Foundations of Chemistry	4.65
3.3.	Microbiology Testing and Technology	4.65
3.4.	Molecular-Genetics Technology	20.93
3.5.	Laboratory Standard Operational Procedures	6.98
3.6.	Culturing	5.81
3.8.	Research and Experiments	6.98
<b>Strand 4. Power Systems</b>		
4.1.	Tool, Stationary and Mobile Equipment Maintenance	2.33
<b>Strand 7. Food Sciences</b>		
7.7.	Biosecurity	4.65



## Principles and Practices of Bioscience

ODE Subject Code: 012015

Outcome #	Outcome Name	% Items In Bank
<b>Strand 3. Biotechnology</b>		
3.1.	Handling, Preparation, Transportation, Storage and Disposal	19.77
3.2.	Foundations of Chemistry	12.79
3.3.	Microbiology Testing and Technology	10.47
3.4.	Molecular-Genetics Technology	17.44
3.5.	Laboratory Standard Operational Procedures	15.12
3.6.	Culturing	6.98
3.7.	Bioreactor Technologies	5.81
3.8.	Research and Experiments	11.63





# Applications of Food Science and Safety

ODE Subject Code: 011030

Outcome #	Outcome Name	% Items In Bank
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.3.	Business Ethics and Law	3.57
1.12.	Site and Personal Safety Procedures	7.14
<b>Strand 7. Food Sciences</b>		
7.1.	The Science of Food	26.19
7.2.	Quality Assurance	10.71
7.4.	Food Production and Processing	15.48
7.5.	Food Product Development	14.29
7.6.	Food Safety and Sanitation	14.29
7.7.	Biosecurity	8.33



# Business Management for Agricultural and Environmental Systems

ODE Subject Code: 010115

Outcome #	Outcome Name	% Items In Bank
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.1.	Employability Skills	12.64
1.2.	Leadership and Communications	13.79
1.3.	Business Ethics and Law	5.75
1.4.	Knowledge Management and Information Technology	4.60
1.5.	Global Environment	1.15
1.6.	Business Literacy	14.94
1.7.	Entrepreneurship/Entrepreneurs	8.05
1.8.	Operations Management	10.34
1.9.	Financial Management	17.24
1.10.	Sales and Marketing	6.90
<b>Strand 7. Food Sciences</b>		
7.7.	Biosecurity	4.60



## Bioresearch

ODE Subject Code: 012025

Outcome #	Outcome Name	% Items In Bank
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.1.	Employability Skills	3.57
1.2.	Leadership and Communications	2.38
1.4.	Knowledge Management and Information Technology	5.95
<b>Strand 3. Biotechnology</b>		
3.1.	Handling, Preparation, Transportation, Storage and Disposal	3.57
3.2.	Foundations of Chemistry	11.90
3.3.	Microbiology Testing and Technology	4.76
3.4.	Molecular-Genetics Technology	39.29
3.5.	Laboratory Standard Operational Procedures	5.95
3.6.	Culturing	10.71
3.7.	Bioreactor Technologies	1.19
3.8.	Research and Experiments	7.14
<b>Strand 7. Food Sciences</b>		
7.5.	Food Product Development	3.57



# Meat Science and Technology

ODE Subject Code: 011020

Outcome #	Outcome Name	% Items In Bank
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.2.	Leadership and Communications	2.33
1.3.	Business Ethics and Law	4.65
1.6.	Business Literacy	2.33
1.8.	Operations Management	2.33
1.9.	Financial Management	2.33
1.10.	Sales and Marketing	4.65
1.12.	Site and Personal Safety Procedures	10.47
<b>Strand 4. Power Systems</b>		
4.1.	Tool, Stationary and Mobile Equipment Maintenance	10.47
4.2.	Equipment Operations	6.98
<b>Strand 6. Environmental Science</b>		
6.7.	Solid Waste and Renewable Resource Management	2.33
<b>Strand 7. Plant Science</b>		
7.1.	The Science of Food	9.30
7.3.	Meat Science	11.63
7.4.	Food Production and Processing	9.30
7.5.	Food Product Development	2.33
7.6.	Food Safety and Sanitation	12.79
7.7.	Biosecurity	5.81



# Environmental Science for Agriculture and Natural Resources

ODE Subject Code: 010720

Outcome #	Outcome Name	% Items In Bank
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.1.	Employability Skills	2.13
1.2.	Leadership and Communications	3.19
1.3.	Business Ethics and Law	1.06
1.11.	Principles of Business Economic	3.19
1.12.	Site and Personal Safety Procedures	2.13
<b>Strand 2. Animal Science</b>		
2.3.	Care and Management	1.06
2.4.	Recognizing Diseases and Disorders	2.13
2.6.	Population Management	1.06
<b>Strand 3. Biotechnology</b>		
3.8.	Research and Experiments	9.57
<b>Strand 6. Environmental Science</b>		
6.1.	Soils	7.45
6.2.	Water Quality	5.32
6.3.	Air Quality	3.19
6.4.	Water Use and Management	3.19
6.5.	Potable Water Treatment	2.13
6.6.	Wastewater Operations	5.32
6.7.	Solid Waste and Renewable Resource Management	7.45
6.8.	Contaminants and Pollution Control	7.45
6.9.	Hazardous Materials and Waste Management	5.32
6.10.	Ecosystems	8.51
6.11	Habitat Management and Restoration	8.51
<b>Strand 8. Plant Science</b>		
8.3.	Pest Management	2.13
<b>Strand 9. Energy</b>		
9.1.	Energy Source	8.51