Program Design

Items to be completed:

- Design/develop curriculum / Identify program outcomes
- Complete new course forms in OCEAN
- Obtain letters of support

Curriculum Design/Development

Program outcomes are a list of broad expectations for what students are expected to achieve in the form of knowledge and skills through the series of each course and experiences in the program. Program outcomes should be validated by experts in the content to be studied and by stakeholders in the program. Please see the following section approach to identifying program outcomes.

Competencies are individual measurable activities, behaviors, and/or skills that demonstrate that the students are achieving the desired outcomes. Competencies should be validated by experts in the content to be studied and by stakeholders in the program. Measurable validation/assessment of student mastery of the competencies occurs at the course level and should be tracked through the courses in the program curriculum.

A matrix for tracking the relation of program outcomes to competencies is presented here:

<table>
<thead>
<tr>
<th>Competency</th>
<th>Outcome #</th>
<th>Course 1</th>
<th>Course 2</th>
<th>Course 3</th>
<th>Course 4</th>
<th>Course 5</th>
<th>Course 6</th>
<th>Course …</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1,5</td>
<td>T, Proj</td>
<td>H</td>
<td></td>
<td></td>
<td></td>
<td>Pres</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td>T</td>
<td>Proj</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9,11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4,5,6</td>
<td>H</td>
<td>T</td>
<td></td>
<td></td>
<td>Proj</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Approach to Identifying Program Outcomes

When identifying the proposed curriculum for the new program, a series of questions should be asked as related to the learning outcomes for the curriculum:

- How will the learning outcomes for the proposed curriculum be decided?
- Does a body of knowledge exist for the subject matter in the curriculum and does it provide guidance as to the learning outcomes to be covered?
- If no body of knowledge exists, how will learning outcomes be identified?
- If the learning outcomes exist, how will the appropriate learning outcomes be selected and validated?

One method of research that can help provide answers to these questions is a Delphi Study (a three-round survey method) to assist with identification and narrowing the possible learning outcomes for a program. In the Delphi methodology, the first questionnaire is open-ended and developed based on a literature review and preliminary conversations with possible program stakeholders. Possible learning outcomes are identified based on the information gathered in the first open survey. These identified learning outcomes for the new curriculum for undergraduates are placed in a Likert-type survey instruments in round two and three. In two, stakeholders are asked to rate importance of each outcome that was identified in round one and add any additional learning outcomes that are missing from the instrument. The results of round two allows a ranked list to be prepared, which is then placed in the round three survey. Per the Delphi method, the items that will be included in survey three will be those items with rankings that fall in the interquartile range. Those items not in the interquartile range from the second survey will be removed from survey three. In survey three, the respondents will be asked to confirm the ratings and hours of study that should be devoted to each item and/or re-rank and provide detailed explanations as to why the change in the ratings. In round three, stakeholders are asked to again rank the list based on most important outcomes to least. By the end of round three, a consensus should be reached as to the top learning outcomes, which should be included in the curriculum.

The Delphi Study technique can confirm and provide validation as to the learning outcomes, which should be included in a new or revised curriculum.

See a sample survey for the BSTOM program on the pages 47-52.
Learning Outcomes for a two-year BS Technical Operations Management Completion Program

Open-ended Survey

Dear _______: I am conducting a study in order to identify learning outcomes for an undergraduate BS Technical Operations Management that will be designed for a midwest college in the near future. I am seeking your expertise because you have been identified as member of one of the following groups:

- Faculty and/or curriculum designers from colleges that have graduate and undergraduate programs in technical operations management or operations management.
- Faculty and curriculum designers from colleges that have operations management courses.
- Alumnus from operations management programs.
- Individuals involved with employing individuals with bachelors in Technical Operations Management.
- Individual employed or engaged in Operations Management or Technical Operations Management.

My objective is to provide you with the constructs I have identified from contemporary literature that relate to this topic. I will do this in the form of open-ended questions to solicit your thoughts and let you develop the ideas further and also request that you provide any additional items, thoughts, or constructs that have been overlooked.

This is the first of a three-round Delphi study. Round two and three will be in the form of Likert-like surveys (ratings-type scales). The round two survey will be provided to you after the results of the round one (open-ended) survey is compiled. The round three survey will be provided to you after the round two survey is compiled.

Your participation in this Delphi study is voluntary. Choosing not to participate at any time before or during the study will result in no consequence to you. Your name will be kept confidential unless you otherwise request it in writing not to be. By filling out the survey, you will have provided consent to participate in this Delphi Study.

This survey will take about 25 minutes to complete. Round two and three of the surveys will each take much less time to complete. Thank you for your assistance. All information will be kept confidential—no identities will be exposed.

The first part of the questionnaire will gather background information from you. The second part presents the open-ended questions. If you have any question about this study, please contact _________________.

Thank you!
Round 1 Delphi

Name of participant: ____________________________
Date: _______________________

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**Expert Categories**

Please indicate which category best describes you.

- Faculty and/or curriculum designers from colleges that have graduate and undergraduate programs in technical operations management or operations management.
- Faculty and curriculum designers from colleges that have operations management courses.
- Individuals involved with employing individuals with bachelors in Technical Operations Management.
- Alumnus from operations management programs
- Individual employed or engaged in Operations Management or Technical Operations Management.

If involved in teaching operations management or technical operations management, what level you teach.

<table>
<thead>
<tr>
<th>Graduate</th>
<th>Undergraduate</th>
<th>Both</th>
<th>Neither</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Is the institution/program/department you work/teach ATMAE, ABET, or AACSB accredited?

Yes ☐  No ☐

By completing this survey, you have given consent to participate in the study.

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**Background of the Study**

This first survey is an open-ended questionnaire. Each question identifies a construct that is found in the literature that may be important to a BS Technical Operations Management (BSTOM) curriculum. This program will be a completion program only; students who have completed a technical associate’s degree may apply for this completion degree.
You are being asked to expand the construct and provide items within the construct that should be included in the BSTOM curriculum. If you find that the constructs presented are not complete, please provide the additional constructs/items that you believe should be included in the BSTOM curriculum. If you feel the construct is not relevant, please indicate so.

1. Productivity
   a. In an undergraduate BSTOM, what factors about productivity should be covered?
      Operations processes, income distribution process, market value process … what other topics in this area should be covered?
   b. In an undergraduate BSTOM, what productivity measures should be covered?
      Single-factor, multifactor, variable types … what other topics in this area should be covered?

2. Ethics and Social Responsibility
   Should ethics and social responsibility be covered in a BSTOM program?
   If so, what areas of ethics and social responsibility should be included in a BSTOM program?
      Conflict of stakeholders, sociality impact … what other topics in this area should be covered?
      Ethic models deontological, utilitarianism, moral relativism … what other topics in this area should be covered?

3. Globalization
   Should a BSTOM teach about globalization issues relating to technical operations management?
   If so, what globalization issues should be covered?
      Labor issues, supply chain issues, import/export, local markets … what other topics in this area should be covered?

4. Project Management
   Should a BSTOM teach about project management?
   If so, what areas of project management should be covered?
      Work breakdown structure, project selection, project charter, project control methods, high performance teams, project management techniques, CPM, project management software, GANT, PERT … what other topics in this area should be covered?
5. Product/Service Design

Service design is the process of planning and organizing, infrastructure, people communications, and materials to deliver at the quality and the interaction level desired by the customer and service provider.

Product design is the process of identifying potential products and designs, then manufacturing these items. This is accomplished through interaction with customers and designers and manufacturing in order to find out what the public wants from old products—how these products can be delivered.

Should a BSTOM program cover topics in Product / Service Design?

If so, what topics should be included in a BSTOM program?

Topics such as standardization, life cycle management, CAD, CAM, value analysis, house of quality, quality function deployment, design for X … what other topics in this area should be covered?

6. Quality Systems

Should quality systems be taught in a BSTOM program?

If so, what systems?

Six sigma, ISO 9000, 14000, lean systems, value stream mapping, good lab, charting, TQM, JIT, benchmarking, service blueprinting, quality circles, practices … what other topics in this area should be covered?

7. Process Selection

Should process selection be taught in a BSTOM program?

If so, what topics in process selection should be taught? Project process, batch, line, continuous, work cells, office layout, retail layout, warehousing layout...

8. Computer Systems and Analytics

Should computer systems and analytics be taught in a BSTOM program?

If so, what topics should be taught?

Spreadsheet setup and analysis, linear programming setup and analysis, data base setup and analysis, flow chart software, advanced word processing, presentation software and skills, remote meeting software … what other topics in this area should be
covered?

9. Supply Chain Management

Should a BSTOM program teach about supply chain management?

If so, what topics should be taught?

Location strategies, exchange rates, political risk break even analysis, call center, factor rating, outsourcing, core competencies, international risk factors, logistics management, on shoring … what other topics in this area should be covered?

10. Purchasing and Procurement

Should a BSTOM program teach about purchasing and procurement?

If so, what topics should be taught?

Vendor evaluation, negotiations, online catalogs, RFQ, inventory tracking, inventory planning, reorder points, fixed period model, contract law, economic order quantity … what other topics in this area should be covered?

11. Associate Resource and Job Design

Should work and productivity measurements be taught in a BSTOM program?

If so, what topics should be taught?

Labor planning, employee stability, legal supervision, work classification, teams, motivation, insensitive plans, time study … what other topics in this area should be covered?

12. Forecasting

Should forecasting be taught in a BSTOM program?

If so, what topics should be taught?

Naïve approach, moving averages, exponential smoothing, error measuring, seasonal variations, cyclical, regression … what other topics in this area should be covered?

13. Inventory and Aggregate Planning

Should a BSTOM program teach about inventory and aggregate planning?

If so, what topics should be taught? ABC analysis, cycle counting, physical inventory, inventory classification methods, FIFO, LIFO,
planning horizons, aggregate planning strategies, independent and dependent demands … what other topics in this area should be covered?

14. MRP and ERP and Scheduling

Should a BSTOM program teach about MRP and ERP and scheduling?

If so, what topic should be taught? Master schedule, bill of materials, lead times, lots, serial numbering, capacity planning, forward and backward scheduling … what other topics in this area should be covered?
New Course Form in OCEAN

New course forms should be completed in OCEAN, OHIO Curriculum Enhancement and Approval Network. For guidelines on new course proposals and course revisions, visit:


OCEAN requires an OHIO ID. It can be accessed at:
https://webapps.ohio.edu/ocean/dashboard/dashboard.htm.

Click on Courses > Create Course Form and select the appropriate type of course.

- Undergraduate Regular Course
- Undergraduate Developmental Course
- Undergraduate Tier I Course
- Undergraduate Tier II Course
- Undergraduate Tier III Course
- Undergraduate Tier III Equivalent Course
- Graduate Regular Course
- Graduate Thesis Course
- Dissertation Course
- Medical Course

In general, you will need to know course info, prerequisites, content, relation to other courses, IR codes, and, if applicable, general education information to complete the process of submitting a new course.

If you have questions or feedback regarding the forms or process in OCEAN, please contact your college’s Curriculum Council representative.
Letters of Support

Depending on the relationship with other programs, departments, institutions, etc., you need to assure that courses not “housed” in your department or college will be available for your students so they can complete your program.

An example is a program in which students earn a minor while completing their major.

Following, on pages 55-56, find sample letters of support provided for the BSTOM program.