



Embedding Advanced Commercial Building Skills into Existing Community College Programs of Study





## Table of Contents

Guidelines	
Process Guide:	
Steps 1 – 5	

Cover photos: (left) Photo by outside photographer, NREL 23645; (top right)Photo by Pat Corkery, NREL 16919; (bottom left) Photo from Sandia National Laboratories, nrel 10230





# Using the Job Task Analysis (JTA) to develop community college curriculum which aligns to its student learning objectives

The U.S. Department of Energy (DOE) and the National Institute of Building Sciences (NIBS) are working with industry stakeholders to develop voluntary national guidelines that will improve the quality and consistency of commercial building workforce credentials for four key energy-related jobs:

- Building Commissioning Professional
- Building Energy Auditor
- Building Operations Professional
- Energy Manager

In the absence of national guidelines, many different workforce training, certificate, and certification programs have emerged. They address different scopes, assess different skills, and demonstrate varying degrees of quality and rigor. This array of credentialing programs creates confusion and uncertainty and adds cost to the industry. It also hampers the development of a quality workforce with clear pathways for professional skill development, and impedes progress in optimizing commercial building performance.

With funding and leadership from DOE, NIBS —a Congressionally authorized non-profit organization and respected building industry convener—has facilitated the guidelines development process. NIBS has created the Commercial Workforce Credentialing Council (CWCC) to drive the guidelines effort. The CWCC is open to all interested industry stakeholders, including building owners,

industry trade associations, credentialing bodies, energy efficiency advocates, utility program administrators, labor unions, the real estate community, and state, local and Federal officials. For each job title, a committee of subject matter experts nominated by the CWCC has developed an industry-validated job task analysis (JTA), outlining key duties, tasks, knowledge, skills, and abilities.

The full JTA reports, and more information on the project, can be found on the NIBS website: nibs.org.

To support curriculum development and adoption of the BBWG by community colleges, student learning objectives (SLO) have been developed from each of the BBWG JTAs. The quantity of learning objectives for each job ranges from 199 to 580. Creating a program of study from this many SLO's, even for one job, can seem a daunting task.

To ease this task, the DOE, working with community colleges, has created the following guidance booklet. This booklet provides a process for integrating SLO's into an existing community college program of study.

To illustrate this process, an example is provided of how the SLO's for the BBWG Building Operations Professional might be combined with an existing community college building automation systems curriculum.

A community college may be interested in comparing their existing program to the industry-recognized BBWG SLO's. If the full process outlined in this document seems daunting, a community college can simply complete Step 1. This allows the community college to gage how many SLO's in an existing program align with the BBWG SLO's.

Educational/training outlines derived from each of the BBWG JTA's are provided along with the JTA at the Resources tab on the NIBS CWCC website (www.nibs. org/cwcc). The SLO's for each job are provided there along with this guidance document.

Additional material that can be used to develop curriculum and programs of study are also available on the CWCC site. Sample course outlines have been provided. These samples outlines can be used as the basis for developing new programs based on the BBWG JTA's.

The CWCC website also contains the learning objectives for each BBWG job description. These learning objectives can be used as demonstrated in the examples here, ie, to integrate these learning objectives into existing programs of study.





### Integration of BBWG in Existing Curriculum: Process Steps



The general process consists of the 5 steps outlined below.

- 1. Sort the BBWG SLO's based on the following criteria
  - a. The BBWG SLO is already covered in the existing program
  - b. The BBWG SLO is similar to a SLO in the existing program, but the program's SLO will require modification to align with the BBWG SLO
  - c. The BBWG SLO is not covered in the existing program.
- Sort the new SLO's into broad categories of on-the-job subject matter, such as building maintenance, contract management, labor & staffing, etc.

- 3. Rank the SLO's based on levels of learning, using a classification structure such as "Bloom's taxonomy".
- 4. Design modules based on the categories in Step 2, and set the order of instruction based on the levels in Step 3.
- 5. Design courses based on modules in Step 4. This includes quantifying contact hours and identifying lab components.

The next 5 pages provide an overview of the 5 steps outlined above. The section titled "Process Guide" provides provides a detailed example of how the SLO's might be integrated in an existing program at a community college. The existing program in the following pages is Building Automation Systems (BAS).





### **PROCESS GUIDE**



In Step 1, crosswalk the SLO's of the existing program with the BBWG SLO's to identify if:

- The BBWG SLO is already covered in the existing program. This is identified as an "Existing Learning Objective" (ELO). Note in which existing course this SLO is covered.
- The BBWG SLO is similar to a SLO in the existing program, but the program's SLO will require modification to align with the BBWG SLO. This is identified as an "Existing Learning Objective

requiring modification" (ELOM). Describe the modification(s) that must be made to the Existing SLO to align with the BBWG SLO.

 The BBWG SLO is not covered in the existing program. This is identified as a "New Learning Objective" (NLO) requiring new curriculum.





### **PROCESS GUIDE**



\* Student learning objectives which are new to the BAS program and require new curriculum are collected into categories in this step

In Step 2, identify categories into which each of the new SLO's (NLO) can be placed. Think of these categories as subject matter areas for the job, as illustrated in the figure above. These categories may be present in the existing program, or they may be new topics. There are no right or wrong ways to determine these initial categories, and they might change slightly as the SLO's are examined line by line.





### **PROCESS GUIDE**



\* Student learning objectives are ranked based on Bloom's taxonomy and/or other ranking system to help organize SLO order of delivery for instruction. The pyramid in the figure above represents the "cognitive" domain.

In Step 3, rank the SLO's according to a classification structure such as "Bloom's Taxonomy". Bloom's Taxonomy classifies SLO's into 3 different domains – cognitive, affective, and psychomotor. Each domain is further divided into skills. The pyramid above represents the skills found in the cognitive domain. Learning the higher level skills within each domain is dependent on learning the lower level skills. If using Bloom's Taxonomy, first classify the SLO in the correct domain, and then rank it in the proper skill category. This will help determine when in the program the SLO should be covered (ie, first week of course, second week, etc), and if it teaching the skill might include a group activity or a lab.





### **PROCESS GUIDE**



In Step 4, design program modules that align with the categories in Step 2, and set the order of instruction based on the outcomes of Step 3. The modules will contain an outline of a curriculum that will be used in Step 5.

This step requires the creativity of the curriculum designer. The detailed example later in the document demonstrates how a competency model can be used to augment course development, by addressing soft skills.

Side bar: competency models As defined on the US Department of Labor-sponsored web site, "Competency Model Clearinghouse", a competency model is "a collection of multiple competencies that together define successful performance in a defined work setting. A model provides a clear description of what a person needs to know and be able to do – the knowledge, skills, and abilities – to perform well in a specific job, occupation, or industry." A competency model contains the entire JTA of a job, as well as soft skills important for workplace success. The SLO's have been developed from the JTA, and tend to be more concrete. The curriculum designer can enhance the learning experience of the student be including components that can help to develop the soft skills identified in the competency model. These components might include group projects or interviewing industry professionals.



### **PROCESS GUIDE**

## Step 5 Design Courses

In Step 5, design courses based on modules in Step 4. This includes quantifying contact hours, and identifying lab components and group projects or exercises.

### **Course: Building Operations Management 1**

Module Name	Credit Hours	BOP SLOs Covered	Lab Component	Order
Bldg. Hazards & Risk Mgmt	1.09	44	Yes	1
Building Inspections	1.11	16	Yes	2
Building Labor & Staffing	0.4	10	No	3
Building Tenant Training	0.4	8	No	4
TOTALS:	3.0	78	Yes	

### Proposed Course: Building Operations Management 2

Module Name	Credit Hours	BOP SLOs Covered	Lab Component	Order
Bldg. Emergency Mgmt.	TBD	25	TBD	1
Bldg. Weather Event Mgmt.	TBD	12	TBD	2
Building Planning	TBD	28	TBD	3
Contract & Project Mgmt.	TBD	25	TBD	4
TOTALS:	<b>3.0</b> approx.	90	Most Likely Yes	







# **Detailed Example:** Embedding BBWG Building Operations Professional in Building Automation Systems existing program

The next section provides a detailed example of the 5 Step process. It assumes an existing community college program in the area of building automation systems (BAS). The example demonstrates how the SLO's for the BBWG Building Operations Professional could be integrated into the existing BAS program of study. The fictional new program would offer the student a credential as a building operations professional.









Step 1	Sort	: SLO	S																
	Paste	e into a	spre	adsh	neet														
K 🛛 🔂 - 🔿 -	La v = INSERT PAGE LA	YOUT FORM	IULAS D/	ATA RE	VIEW	VIEW	B	ook1 - Excel			) R	) ~		_		J	) .	? 📧 — Brian Love	B X
Paste	Calibri B I U -	• 11 • A^	≡ ≡	= ≫· = (= )	E Me	ap Text erge & Cente	Gen r * \$	eral * % *	v •0.00 •0.00	Conditional Formatting ▼	Format as Table +	Cell Styles •	€ E Insert	Delete For	nat ₹	AutoSum Fill • Clear •	Sort & F	Find &	
Clipboard	$\times \checkmark f_x$	nt	F <u>a</u>	Ali	gnment		5	Number	Fa		Styles			Cells		Ed	iting		~
A B 1 1. develop a w 2 2. develop sou 3 3. demonstrate 4. com Paste O 5. dem 7 7. analyze staff 8 8. be demonstrate 9 9. evaluate the	C D orkload analyses. Des of work for buil how to determine ptions: Ding productivity rate how to compare quality of staff wo	E Iding operation e equipment m o building op- or contract ag fing models to the actual work of the actual work of the actual work of the second the second second second second second the second second second second second second second second second second the second se	F ns personne ultipliers by erations sta greements for building order hours	G el y evaluatin iffing beno g operation to estima	H ng the equ chmarks ns ted work	i uipment order hour	5	K		M	N			P	Q	R	S	T	
10 10. compare proc	ductivity to operati	ons plans								: •									
READY						_					_				⊞			-	+ 100%

This example illustrates adding the BBWG student learning objectives into an existing program. Therefore, it is necessary to identify which are new, those which exist already in the program (ELO), and those which exist in the program but require slight modification (ELOM). In the next activity, the user tags each learning objective according to whether or not the SLO is present in the existing program. Tagging allows Excel search features to be utilized.

A	В	С	D	E	F	G	H 🔺
1 1. NLO develop a workload analyses.							
2 2. NLO develop scopes of work for building operations personnel	1						
3 3. NLO demonstrate how to determine equipment multipliers by evaluating the equipment							
4 4. NLO compare staffing requirements to building operations staffing benchmarks							
5 5. NLO demonstrate a knowledge of labor contract agreements							
6 6. NLO demonstrate a knowledge of staffing models for building operations							
7 7. NLO analyze staffing productivity							
8 8. NLO be demonstrate how to compare actual work order hours to estimated work order hours							
9 9. NLO evaluate the quality of staff work							
10 10. NLO compare productivity to operations plans							
11 11. ELOM analyze reasons for rework and call-backs							
12 12. NLO analyze deferred maintenance backlogs and develop a plan to address them							
13 13. ELOM track and benchmark overtime							
14 14. ELOM supervise building staff							
15 15. ELOM delegate work to staff							
16 16. ELOM create work schedules for staff							
17 17. ELOM describe how to train facility staff							
18 18. ELOM develop staff training programs							
19 19. ELOM describe how to manage conflicts among staff							
20 20. ELOM describe methods for disciplining staff							
21 21. ELOM create staffing plans including on call and after work hours schedules							
22 22. ELOM describe methods for mentoring staff							
23 23. ELOM describe various learning styles	1						
BOP SLOs New Learning Objectives   Existing Learning Objective							Þ
READY			<b>=</b>	8 🗉	]		+ 100%





### **PROCESS GUIDE: Step 1**

## Step 1

## Sort SLOs

Use Excel's Find feature and begin separating the three types of learning objectives into their own sheets. At the bottom of this screenshot, you will see three new sheets labeled according to objectives they will hold.

3 3. NLO demonstrate how to determine equipment multipliers by evaluating the equipment	Find and Replace ? ×
4 4. NLO compare staffing requirements to building operations staffing benchmarks	
5 5. NLO demonstrate a knowledge of labor contract agreements	Find Replace
6 6. NLO demonstrate a knowledge of staffing models for building operations	Find what: ELOM V No Format Set Format
7 7. NLO analyze staffing productivity	
8 8. NLO be demonstrate how to compare actual work order hours to estimated work order hours	
9 9. NLO evaluate the quality of staff work	Within: Sheet V Match case
10 10. NLO compare productivity to operations plans	Search: By Rows V Match entire cell contents
11 11. ELOM analyze reasons for rework and call-backs	Look in: Formulas M
12 12. NLO analyze deferred maintenance backlogs and develop a plan to address them	
13 13. ELOM track and benchmark overtime	Find All Find Next Close
14 14. ELOM supervise building staff	
15 15. ELOM delegate work to staff	Book Sheet Name Cell Value
16 16. ELOM create work schedules for staff	BOP Sorting Spreadsheet.xlsx BOP SLOs \$A\$484 484. ELOM de
17 17. ELOM describe how to train facility staff	BOP Sorting Spreadsheet.xlsx BOP SLOs \$A\$559 559. ELOM de 🗸
18 18. ELOM develop staff training programs	< >>
19 19. ELOM describe how to manage conflicts among staff	85 cell(s) found
20 20. ELOM describe methods for disciplining staff	
21 21. ELOM create staffing plans including on call and after work hours schedules	
22 22. ELOM describe methods for mentoring staff	
23 23. ELOM describe various learning styles	
ROP SLOs New Learning Objectives Existing Learning Objectives Existing Learning Objectives	w Modi 🕀 : d
READY	COUNT: 85 🗰 🗐 – — + 100%

The BOP learning objectives which already exist in the automation program, but which will require slight modification (ELOM) to align properly are shown in their own sheet here after being copied.

25. ELOM describe various tearming styles     25. ELOM create the request for proposals (RFPs) and scope of work (SOW)     26. FLOM review a protect plan and determine requirements for outside services (skills, resources, service levels, etc.)	Find and Replace ? ×
ELOM demonstrate knowledge of the licensing requirements for various trades and outsourced services     A. ELOM conduct gap analyses	Find         Reglace           Find what:         ELOM         V         No Format Set         Format
37. ELOM document procedures for building operations           38. ELOM update and test new/revised procedures for building operations           39. ELOM implement revised procedures for building operations	Within: Sheet V Match case
40. ELOM train staff on new/revised procedures for building operations           41. ELOM evaluate the success of new/revised procedures for building operations	Search:         By Rows         Imatch entire cell signets           Look in:         Formulas         V   Options <<
45. ELOM develop equipment operations plans     48. ELOM develop operation procedures (steps in operation) for specific systems and equipment	Find All Find Next Close
Image: Second	Book Sheet Name Cell Valu BOP Sorting Spreadsheet (version 1).xlsb BOP SLOs SAS484 484. BOP Sorting Spreadsheet (version 1).xlsb BOP SLOs SAS59 559.
	85 cell(s) found



### **PROCESS GUIDE: Step 1**

U.S. DEPARTMENT C

ENERGY

### Step 1

## Sort SLOs

The objectives which don't exist in the automation program, but will need to be taught to cover all the BOP's content, termed new learning objectives (NLO), are selected here for copy into their own sheet.

5/1[5/1. NLO evaluate equipment and potential failures	Find and Replace ? ×
572 572. NLO identify contractors/service providers requirements	
573 573. NLO identify staffing requirements for future service activities	Fing Replace
574 574. NLO identify special maintenance needs	Find what: NLO V No Format Set Format V
575 575. NLO identify potential code changes affecting operations	
576 576. NLO review maintenance backlog and deferred activities	A Match and
577 577. NLO identify rate increases	Within: Sheet
578 578. NLO review non-normal operating categories (snow removal, etc.)	Search: By Rows
579 579. NLO manage actual expenditures to budgets	Look in: Formulas ¥ Options <<
580 580. NLO contribute to capital improvement budget(s)	
581 581. NLO review expected life of systems and facilities	Find All Eind Next Close
582 582. NLO review previous budgets	
	Book Sheet Name Cell Valu ^
New Learning Objectives Existing Learning Objectives Existing Learning Objectives	BOP Sorting Spreadsheet (version 1).xlsb BOP SLOs \$A\$588 588.
Select destination and press ENTER or choose Paste	BOP Sorting Spreadsheet (version 1).xlsb BOP SLOs SA\$589 589. V + 100%
	< >>
	310 cell(s) found

#### New learning objectives shown after their copy ? × Find and Replace 13 27. NLO eview a project plan and determine the type of contract that will be needed (prescriptive or performanc Fin<u>d</u> Re<u>p</u>lace 14 28. NLO eview proposals or RFP responses for a project and determine the best proposal ✓ No Format Set Format... ▼ Find what: NLO 15 29. NLO evelop a contractor/service provider handbook 16 30. NLO escribe the purposes and the process for conducting orientation for service providers ✓ ✓ Match <u>c</u>ase 17 31. NLO dentify criteria for selection of service providers for a project Within: Sheet 18 32. NLO lescribe how to secure the services of outside service providers (sign contracts, etc.) for a project 19 34. NLO Update procedures (SOPs, BOPs, operating plans, emergency plans, etc.) Match entire cell contents Search: By Rows ~ Options < < Look in: Formulas ~ 20 35. NLO evaluate building use changes 21 42. NLO update emergency operating procedures 22 43. NLO update disaster recovery plans Find All Eind Next Close 23 44. NLO semonstrate knowledge of the National Incident Management System (NIMS) Valu ^ Book Sheet Cell Name BOP SLOS New Learning Objectives Existing Learning Objectives Existing Learning Obj w M BOP Sorting Spreadsheet (version 1).xlsb BOP SLOs \$A\$588 588. • BOP Sorting Spreadsheet (version 1).xlsb BOP SLOs \$A\$589 589. Select destination and press ENTER or choose Paste > 310 cell(s) found

The learning objectives which appear in the BOP and the automation program are termed existing learning objectives (ELO), and are being copied here for movement into their own sheet

											Find a	nd Re	place			r	<u> </u>		
11	llumor	مد ممط ان	abtina		ate	-													
Ca	Calibri	- 11	- A	A \$	- %	, <u>=</u>	Find	Rep	lace										
В	ΒI	= 🕭 -	- <u>A</u> -	-	€.0 .00 .00 <b>→</b> .0	*	Find what	at:	FLO			~	No Ec	urmat Set		Format			
					_							•			_	. orman			
X	K Cu	t																	
- Fr	Èn Co	ov					Within:	She	et	~	✓ Matc	h <u>c</u> ase							
	A D-						Search:	By F	lows	~	🗌 Mato	h entire	e cell c <u>o</u> r	itents					
cte 🗋	e ra	ste Optio	ons:				_								0				
		123	.fx ₽	8 %			LOOK IN:	For	nulas	~						pilons	**		
	Pas	ste Specia	al		•														
	_											Find All		Eind Ne>	đ	Clo	se		
	lns	ert					Book					She	eet	Name	Cell		Valu ^		
	Del	lete					BOR Sortin	na Sn	eadche	at luarc	ion 1) via	b 80			CVC.	544	544		
	Cle	ear Co <u>n</u> ter	nts				BOP Sortin	na Sp	readshe	et (vers	ion 1).xls	b BO	P SLOs		SAS	557	557. ~		
12		ick Analy					<										>		
lis	= Qu	пск Апату	515				194 cell(s) fo	ound											
	Filt	t <u>e</u> r			•				i										
	Sor	rt			- 1														
		ert Comn	nent																
	Del	lete Co <u>m</u> i	ment			0	-		i										
e 0	Eor	rmat Cells	5			(+) :	4												
	Pic	k From D	rop-do	wn List							OUNT: 1	94	Ħ	8.	<b>-</b> -		-		100%
		Gara Mana			[														
	Det	nne N <u>a</u> m	e																
	dis:	Juurente Calibri B 7 Calibri B 7 Calibri Cali	Item some and II       Calibri • [11]       B     I       B     I       Calibri • [11]       Calibri • [11]       Calibri • [11]       Paste Option       Insert       Delete Compte       Compt Calibri       Pick From D	dumence and lichtim       Calibri - 11 - A^       B     I       B     I       Copy       <	Itemacan and Italian access         Calibri - [11 -] A' A' \$         B I = A' A A' \$         B Cut         Copy         Copy         Paste Options:         Paste Optio	Immediate and lite bias assessed.         Calibri • 11 • A* A* S • %         B I ≡ 2 • A • 11 • 5% 8%         % Cut         © Copy         Paste Options:         Paste Options:	It is a constraint of the transmission of transmis	Image: conduct biase concenter.         Calibri - 11 - A' A' \$ 96 % E         B I = A + A + F         B I = A + A + F         B I = A + A + F         B I = A + A + F         B I = A + A + F         B I = A + A + F         B I = A + A + F         B I = A + A + F         B I = A + A + A + F         B I = A + A + A + A + A + A + A + A + A + A	Calibri - 11 - A' A S - 96 - E         B I = 2 - 4 - 10 - 588 - 88 - 8         B I = 2 - 4 - 10 - 588 - 88 - 8         B I = 2 - 4 - 10 - 588 - 88 - 8         B I = 2 - 4 - 10 - 588 - 88 - 8         B I = 2 - 4 - 10 - 588 - 88 - 8         B I = 2 - 4 - 10 - 588 - 88 - 8         B I = 2 - 4 - 10 - 588 - 88 - 8         B I = 2 - 4 - 10 - 588 - 88 - 8         B I = 2 - 4 - 10 - 588 - 88 - 8         B I = 2 - 4 - 10 - 588 - 88 - 8         B I = 2 - 588 - 88 - 8         B I = 2 - 588 - 88 - 8         B I = 2 - 588 - 88 - 8         B I = 2 - 588 - 88 - 8         B I = 2 - 588 - 88 - 8         B I = 2 - 588 - 88 - 8         B I = 2 - 588 - 8         B I = 2 - 58	Image: Second line in a concenter         Calibri - 11 - A A A S - 96         B I = A - A - 10 - 58 48         Mark S - 96         B I = A - A - 10 - 58 48         Mark S - 96         Mark S - 96         Find Reglace         Find Write         Elo         Mark S - 96         Mark S - 96	Image: Second List in a concentration of the line concentration	Image: send lize bit is a concenter         Calibri - 11 - A A A S - 96 - E         B I = A - A - E - 58 - 88 - 8         Fing Regiace         Paste Options:         Paste Special         Insert         Delete         Clear Cognent         Soft         Delete Comment         Fing Regiace         Fing Regiace         Fing Regiace         Fing Regiace         Fing Regiace         Fing Regiace         Book         Book         Boo	Image: second litebook in a consensation of the litebook in a consensensation of the litebook in a consensation	Calibri - 11 A* A* \$ + % + @   Calibri - 11 A* A* \$ + % + @   Calibri - 11 A* A* \$ + % + @   B I = 0+ A + @ - 10+ % & 0   Match entre cell cgr   Copy   Paste Options:   Paste Options:   Paste Options:   Paste Options:   Paste Options:   Paste Options:   Clear Cogtents   Quick Analysis   Filter   Sgrt   Insert Cogment   Delete Comment   E format Cells   Pick From Drop-down List	Image: second lizebolic exercises         Calibri • 11 • A* A* \$ • % • E         B I = 2 • A • E • 5% #8         Find         Reglace         Find         Reglace         Find         Paste Options:         Insert	Interance and lick his escenaria.         Calibri - 11 - A* A* \$ - % - % - %         B I = A - A - 11 - A* A* \$ - % - %         B I = A - A - 11 - A* A* \$ - % - %         Find Reglace         Find What:         El Gopy         B I = A - A - 11 - A* A* \$ - % - %         Calibri - 11 - A* A* \$ - % - %         B I = A - A - 11 - 5%         Soft         B I = A - A - 11 - 5%         B I = A - A - 11 - 5%         B I = A - A - 11 - 5%         B I = A - A - 11 - 5%         B I = A - A - 11 - 5%         B I = A - A - 11 - 5%         B I = A - A - 11 - 5%         B I = B I = A - A - 11 - 5%         B I = B I = A - A - 11 - 5%         B I = B I = A - A - 11 - 5%         B I = B I = A - A - 11 - 5%         B I = B I = A - A - 11 - 5%         B I = B I = A - A - 11 - 5%         B I = B I = A - 11 - 5%         B I = B I = A - 11 - 11 - 11 - 11 - 11 - 11 - 11	Calibri 11   Copy Match case   Search: 10   Paste Options: 10   Cok in: Formulas   Cok in: Formulas   Cok in: Formulas   Paste Options: Cok   Cok in: Formulas   Columnet Cok   Book Spreadsheet (version 1),stb   Book Sobes   Soft Sassar   Soft Sassar   Counce Sassar   Counce Sassar   Counce Sassar   Counce Counce   Counce	Calibri - 11       A* A* \$ * %         B I = 2 * A * 11 * 5% 3%       Find         Reglace       Find what         ELO       No Format Set         Find what       ELO         Match pase         Scopy         Copy         Paste Options:         Paste Options:         Paste Special         Paste Special         Paste Special         Paste Special         Book         Book         Book         Sourds         Quick Analysis         Filtgr         Sqrt         Delete Comment         Pick From Drop-down List	Calibri 111   Calibri 111





### **PROCESS GUIDE: Step 1**

Sort SLOs	
ELOs shown after copy	Find and Replace ? ×
Is required to maintain the equipment in a facility/building	Find       Replace         Find what:       ELO       No Format Set       Format •         Within:       Sheet       Match gase       Sheet       Sheet         Search:       By Rows       Match entire cell contents       Options <
OS New Learning Objectives Existing Learning Objectives Existing Learning Obj w Mo ENTER or choose Paste	ddi (+) 注 (
	Sort SLOs ELOs shown after copy Is required to maintain the equipment in a facility/building y It is important to review construction specifications prior to construction design and bid nstruction designs to actual building requirements ut to construction designs based on existing systems initials o commissioning ut into the facility strategic plan e knowledge of emerging technologies and tools that may affect facilities/buildings impact of change on tenant/occupant space toos for extending the life of equipment and systems hilty/equipment/system data acquisition and management plans maintain asset inventories pdated building as-built plans S New Learning Objectives Existing Learning Objectives Existing Learning Objectives Existing Learning Objectives

The existing learning objectives are matched with the courses they appear in within the building automation program.

76     296. ELO verify systems availability     BUAS 2010       77     297. ELO evaluate alternative scheduling needs (holidays, inclement weather, etc.)     BUAS 2010       78     298. ELO document building operations     BUAS 2010       79     299. ELO operate renewable technologies (solar, wind, energy storage systems, distributed generation, water recovery systems, etc.)     BUAS 2010       80     300. ELO maintain the BAS system     BUAS 2020, 2030       81     301. ELO maintain the BAS system database     BUAS 2020, 2030, 2040       82     Availability     Existing Learning Objectives     Existing Learning Obj w Modify	A	В	C	D
77       297. ELO evaluate alternative scheduling needs (holidays, inclement weather, etc.)       BUAS 2010         78       298. ELO document building operations       BUAS 2010         79       299. ELO document building operations       BUAS 2010         70       297. ELO operate renewable technologies (solar, wind, energy storage systems, distributed generation, water recovery systems, etc.)       BUAS 2010         80       300. ELO maintain the BAS system       BUAS 2020, 2030         81       301. ELO maintain the BAS system database       BUAS 2020, 2030, 2040         82.822       FLG complete a ztki/th canout#       BUAS 2020, 2030, 2040         (+ ) New Learning Objectives       Existing Learning Obj w Modify       (+) : (+)	76 296. ELO verify systems availability	BUAS 2010		
78       298. ELO document building operations       BUAS 2010         79       299. ELO operate renewable technologies (solar, wind, energy storage systems, distributed generation, water recovery systems, etc.)       BUAS 2010       BUAS 2010         80       300. ELO maintain the BAS system       BUAS 2020, 2030       BUAS 2020, 2030         81       301. ELO maintain the BAS system database       BUAS 2020, 2030, 2040         82       820. FLG complete a stak/th concrete       BUAS 2020, 2030, 2040         4       >        New Learning Objectives       Existing Learning Obj w Modify         €EADY       COUNT: 195       Em       Im      +	77 297. ELO evaluate alternative scheduling needs (holidays, inclement weather, etc.)	BUAS 2010		
179 299. ELO operate renewable technologies (solar, wind, energy storage systems, distributed generation, water recovery systems, etc.)       BUAS 2010         80 300. ELO maintain the BAS system       BUAS 2020, 2030         81 301. ELO maintain the BAS system database       BUAS 2020, 2030         82 302. FLO completa estivity canover       BUAS 2020, 2040         82 302. FLO completa estivity canover       BUAS 2020, 2040         • • New Learning Objectives       Existing Learning Obj w Modify         • •	78 298. ELO document building operations	BUAS 2010		
80       300. ELO maintain the BAS system       BUAS 2020, 2030         81       301. ELO maintain the BAS system database       BUAS 2020, 2030         82       302. ELO maintain the BAS system database       BUAS 2020, 2030         82       302. ELO maintain the BAS system database       BUAS 2020, 2030         1       301. ELO maintain the BAS system database       BUAS 2020, 2030         1       302. ELO maintain the BAS system database       BUAS 2020, 2030         1       New Learning Objectives       Existing Learning Objectives       Existing Learning Objectives         READY       COUNT: 195       III       III	79 299. ELO operate renewable technologies (solar, wind, energy storage systems, distributed generation, water recovery systems, etc.)	BUAS 2010		
81 301. ELO maintain the BAS system database       BUAS 2020, 2030, 2040         R2 302. FIG complete a stakity seconte       BUAS 2020, 2030, 2040         + → New Learning Objectives       Existing Learning Objectives         Existing Learning Objectives       Existing Learning Objectives         READY       COUNT: 195	80 300. ELO maintain the BAS system	BUAS 2020, 2030		
RA1 (202)     EX a consolidata a stakith computer       I >     New Learning Objectives       Existing Learning Objectives     Existing Learning Objectives       Exact     COUNT: 195       III III IIIIIIIIIIIIIIIIIIIIIIIIIIIII	81 301. ELO maintain the BAS system database	BUAS 2020, 2030, 2040		
↓       New Learning Objectives       Existing Learning Objectives       Existing Learning Obj w Modify       ⊕         READY       COUNT: 195       III       III       III       +       +       100%	82 292 ELO completo activity reports	PUAS 3010, 2010		L .
READY COUNT: 195 🗰 🗐 – – + 100%	Image: Market Arrow     New Learning Objectives     Existing Learning Objectives     Existing Learning Objectives			Þ
	READY	COUNT: 19	■ ■ ■	+ 100%

The existing learning objectives are then further matched with the competency area within the courses they line up with.

1	BOP Learning Outcomes (existing in Building Automation Program)	Courses	Specify competency area from course
2 46	<ul> <li>ELO determine required equipment start/stop times based on tenant occupancies</li> </ul>	BUAS 2010	Control theory
3 47	7. ELO extract equipment specific information from O&M manuals	BUAS 1040, 2030	BUAS 1040 - Engineering Data Sheet Interpretation, B
4 50	ELO develop equipment operating logs	BUAS 2010	All-air, All-water, Air & water systems, Boiler, Chiller
5 52	ELO develop planned maintenance schedules	BUAS 2010	All-air, All-water, Air & water systems, Boiler, Chiller
6 53	8. ELO create equipment inventories	BUAS 2010	All-air, All-water, Air & water systems, Boiler, Chiller
7 54	<ul> <li>ELO identify equipment specifications for equipment in a facility/building</li> </ul>	BUAS 2030	Engineering data sheet interpretation
8 55	<ul> <li>ELO identify O&amp;M requirements for equipment in a facility/building</li> </ul>	BUAS 2010	All-air, All-water, Air & water systems, Boiler, Chiller
9 58	8. ELO identify equipment maintenance tasks to be outsourced to third party vendors	BUAS 2030	BAS Industry Contracting
10 59	<ol> <li>ELO identify skill level of staff for repairing and maintaining equipment in a facility/building</li> </ol>	AIRC 1010 / BUAS 1010	Overview of mechanical / controls skil s
11 60	<ol> <li>ELO identify tools required to maintain the equipment in a facility/building</li> </ol>	AIRC 1010 / BUAS 1010, 2030	Overview of mechanical / controls skil s
12 73	. ELO describe why it is important to review construction specifications prior to construction design and bid	BUAS 2030	BAS Industry Contracting
13 74	<ul> <li>ELO compare construction designs to actual building requirements</li> </ul>	BUAS 2030	BAS Industry Contracting
14 75	<ul> <li>ELO provide input to construction designs based on existing systems</li> </ul>	BUAS 2030	BAS Industry Contracting
15 76	i. ELO review submittals	BUAS 2030	BAS Industry Contracting
16 7	ELO contribute to commissioning planning	BUAS 2030	Control system commissioning process
•	New Learning Objectives Existing Learning Objectives Existing Learning Obj w Modify ÷ · · · ·		4
READY		COUNT: 19	5 🌐 🗉 🗉+ 100%





### **PROCESS GUIDE: Step 1**

## Step 1

## Sort SLOs

The learning objectives which are closely related to competencies within the existing building automation program, but which require slight modification to completely cover the BOP objectives are connected to their courses.

A	В	C 🔺
42 81. ELOM compare various equipment and systems for equivalency/comparability	BUAS 2010	
43 82. ELOM identify when equipment substitutions are acceptable and when they are not acceptable	BUAS 1040, 2010	
44 92. ELOM analyze ongoing maintenance requirements	BUAS 2010	
45 101. ELOM create and maintain handwritten logs	BUAS 2010	
46 104. ELOM maintain inspection records	BUAS 2010	
47 114. ELOM conduct a building inspection	BUAS 2030	
48 115. ELOM describe the types of building inspections that should be conducted daily, monthly, and quarterly	BUAS 2030	
49 129. ELOM manage fire drills	AIRC 1005	
50 130. ELOM manage emergency evacuation drills (earthquakes, fires, etc.)	AIRC 1005	
← → … New Learning Objectives Existing Learning Objectives Existing Learning Objectives :      ←		•
READY	COUNT: 55 🏢 🗐	🛄 – — + 100%

#### Specific modifications required to existing curriculum competencies are described

A	В	C					
42 81. ELOM compare various equipment and systems for equivalency/comparability	BUAS 2010	modify building mechanical systems instruction to include comparison unit					
43 82. ELOM identify when equipment substitutions are acceptable and when they are not acceptable	BUAS 1040, 2010	1040 - cut sheet instruction section on comparison / 2010 - modify building mechar					
44 92. ELOM analyze ongoing maintenance requirements	BUAS 2010	further discussion on maintenance of mechnical systems covered in class					
45 101. ELOM create and maintain handwritten logs	BUAS 2010	present log template and requirements when covering mechanical systems					
46 104. ELOM maintain inspection records	BUAS 2010	present inspection record samples in class when covereing mechanical systems					
47 114. ELOM conduct a building inspection	BUAS 2030	embellish upon exisiting commissioning section units of course					
48 115. ELOM describe the types of building inspections that should be conducted daily, monthly, and quarterly	BUAS 2030	embellish upon exisiting commissioning section units of course					
49 129. ELOM manage fire drills	AIRC 1005	include more coverage emergency action plans and drills to safety modules					
50 130. ELOM manage emergency evacuation drills (earthquakes, fires, etc.)	AIRC 1005	include more coverage emergency action plans and drills to safety modules					
51 134. ELOM track and record building evacuation times	AIRC 1005	include more coverage emergency action plans and drills to safety modules					
52 135. ELOM create building evacuation results reports	AIRC 1005	include more coverage emergency action plans and drills to safety modules					
53 138. ELOM describe best practices for emergency drills	AIRC 1005	include more coverage emergency action plans and drills to safety modules					
54 139. ELOM describe the conditions under which a building should be evacuated	AIRC 1005	include more coverage emergency action plans and drills to safety modules					
Mew Learning Objectives     Existing Learning Objectives     Existing Learning Objectives	÷ : •	٩ ا					
READY		COUNT: 55 🏢 🗐 🖳 – – – – + 100					





### PROCESS GUIDE: Step 2

### Step 2 Categorize SLOs

The learning objectives which will be completely new to the building automation curriculum (NLO) are now addressed. These represent new curriculum. The first step here is to identify broad categories for the objectives, and this initial, informed guess at categorization is shown (based on a thorough review of the objectives). Each category is given its own sorting code for ease of searching, and they can be altered later if necessary.

	A	В	С	1 🔺
1	BOP Learning Outcomes (new to the Building Automation Program)	Learning Outcome Categories Identification	Category sorting code	
2 1.	NLO develop a workload analyses.	Building Maintenance	BM_	
3 2.	NLO develop scopes of work for building operations personnel	Building Systems Management	BSM_	
4 3.	NLO demonstrate how to determine equipment multipliers by evaluating the equipment	Contract Management	CM_	
54.	NLO compare staffing requirements to building operations staffing benchmarks	Emergency Management	EMM_	
6 5.	NLO demonstrate a knowledge of labor contract agreements	Energy Management	ENM_	
7 6.	NLO demonstrate a knowledge of staffing models for building operations	Hazards Management	HM_	
8 7.	NLO analyze staffing productivity	Labor & Staffing	LS_	
9 8.	NLO be demonstrate how to compare actual work order hours to estimated work order hours	Project Management	PM_	
10 9.	NLO evaluate the quality of staff work			
11 10.	NLO compare productivity to operations plans			
12 12.	NLO analyze deferred maintenance backlogs and develop a plan to address them			
13 24.	NLO demonstrate knowledge of various trade and union requirements for tradespersons			
14 27.	NLO review a project olan and determine the type of contract that will be needed (prescriptive or performance)           BOP SLOS         New Learning Objectives         Existing Learning Objectives         Existing Learning Objectives			Þ
READY		COUNT: 9 🏢 🗐 💾	+ 10	00%







## Step 2 Categorize SLOs

All of the new learning objectives are now tagged into the categories where they best fit.

	A	В	C I
1	BOP Learning Outcomes (new to the Building Automation Program)	Learning Outcome Categories Identification	Category sorting code
2 1.	LS_NLO develop a workload analyses.	Building Maintenance	BM_
3 2.	LS_NLO develop scopes of work for building operations personnel	Building Systems Management	BSM_
4 3.	BSM_NLO demonstrate how to determine equipment multipliers by evaluating the equipment	Contract Management	CM_
5 4.	LS_NLO compare staffing requirements to building operations staffing benchmarks	Emergency Management	EMM_
6 5.	LS_NLO demonstrate a knowledge of labor contract agreements	Energy Management	ENM_
7 6.	LS_NLO demonstrate a knowledge of staffing models for building operations	Hazards Management	HM_
8 7.	LS_NLO analyze staffing productivity	Labor & Staffing	LS_
9 8.	LS_NLO be demonstrate how to compare actual work order hours to estimated work order hours	Project Management	PM_
10 9.	LS_NLO evaluate the quality of staff work		
4	BOP SLOS New Learning Objectives Existing Learning Objectives Existing Learning Obj w Modi		Þ
READY		COUNT: 312 🎹 🗐 🎮	+ 100
			-

New sheets are created for each of the new categories for the learning objectives which will be new to the building automation program.



Searches are performed according to the codes which were affixed to the objectives (in this case Building Maintenance BM\_)

A 68. BM_NLO review previous budgets and performance against budgets	
68. BM_NLO review previous budgets and performance against budgets	
	Find Replace
69. BM_NLO identify future changes in operations or occupancy usage projections	Finductual Dia La Council Cat
70. BM_NLO benchmark operations budgets (RS means)	Find what: BM_ V No Format Set Format •
<ol> <li>BSM_NLO evaluate equipment and potential failures</li> </ol>	
<ol> <li>CM_NLO identify contractors/service providers requirements</li> </ol>	Within: Sheet V Match case
<ol> <li>LS_NLO identify staffing requirements for future service activities</li> </ol>	Match entire cell contents
74. BM_NLO identify special maintenance needs	Search: By Rows
75. BM_NLO identify potential code changes affecting operations	Look in: Formulas V Options <<
<ol> <li>BM_NLO review maintenance backlog and deferred activities</li> </ol>	
77. EM_NLO identify rate increases	Find All Eind Next Close
<ol> <li>BM_NLO review non-normal operating categories (snow removal, etc.)</li> </ol>	
79. BM_NLO manage actual expenditures to budgets	Book Sheet Name Cell Vo
<ol> <li>BSM_NLO contribute to capital improvement budget(s)</li> </ol>	BOP Sorting Spreadsheet.xlsx New Learning Objectives \$A\$310
81. BSM_NLO review expected life of systems and facilities	BOP Sorting Spreadsheet.xlsx New Learning Objectives SA\$312
82. BM_NLO review previous budgets	
BOP SLOs     New Learning Objectives     Existing Learning Objectives     Existing Learning Objectives     Existing Learning Objectives	
	COUNT: 312 🌐 🗉 – — 🖬 + 100%







Step 2	Categorize SLO	S				
	Those objectives sel	ected	are	then	moved	into their own sheets.
						Find and Replace ? ×
	A	В	С	D	E F	Find Replace NOA
1 Building Mainten 2 12. BM_NLO an	ance Related Learning Objectives alyze deferred maintenance backlogs and develop a p	an to address	them			Find what: BM_ v No Format Set Format v
3 34. BM_NLO Up 4 35. BM_NLO ev 5 83. BM_NLO an 6 84. BM_NLO an 7 85. BM_NLO de	late procedures (SOPs, BOPs, operating plans, emerge aluate building use changes alyze existing capital renewal plans alyze organizational strategic plans veloo and review facility condition indexes	r cy plans, etc	.)			Wittpin:     Sheet     V     Match case       Search:     By Rows     Match entire cell contents       Look in:     Formulas     V
8 86. BM_NLO ad 9 88. BM_NLO pr	vise on new conditions within the facility and propert prote sustainable materials and practices for renewal	1				Find All Eind Next Close
10 168. BM_NLO d 11 169. BM_NLO p 12 170. BM_NLO o 13 171. BM_NLO d	escribe how to schedule third party inspections epare equipment for inspections (shut down, etc.) perate equipment for inspections (elevator recall, etc scribe ways to participate in inspections (escort the l	)				Book         Sheet         Name         Cell         V           BOP Sorting Spreadsheet.xlsx         New Learning Objectives         SA5310         E           BOP Sorting Spreadsheet.xlsx         New Learning Objectives         SA5310         E           C         Image: Spreadsheet.xlsx         New Learning Objectives         SA5312         E
14 172. BM_NLO d 15 173. BM_NLO d	escribe how to schedule inspections with internal states erify safety for inspectors (hazards, etc.)	f affected				166 cell(s) found
16 174. BM_NLO d 17 175. BM_NLO d	escribe how to communicate with building tenants re- escribe how to communicate results with parties	arding inspec	tion requ	uirements		
<ul> <li>BOI</li> </ul>	SLOs New Learning Objectives Existing Learni	ig Objectives	Exist	ing Learning	g Obj w Modify	Building Maintenance Bldg Systems Management Contract Mana (+) : (+)
Select destination and p	ess ENTER or choose Paste					COUNT: 166 🗮 🗐 🛄







### **PROCESS GUIDE: Step 3**

### Step 3 Ra

### Rank SLOs

Use Bloom's taxonomy to rank the learning objectives as to level of learning, and organize them top-to-bottom on that basis. Cognitive domain ranking is shown here. This will assist in ordering the learning objectives when building curriculum. The identified levels of learning are shown in bold

		C	D	E	F	G	н	1	J	K	L	- 2
M_NLO demonstrate knowledge of heat island reduction (roof and non-roof)												
M_NLO demonstrate knowledge of "green teams" with facility tenants/occupants												
M_NLO maintain (label / knowledge level) egress/access documentation (doors and window counts)												
M_NLO perform (recognize / knowledge level) security functions (monitor for potential unauthorized access)												
M_NLO respond (recognize / knowledge level) to unauthorized access												
M_NLO complete (enumerate / knowledge level) certificates and compliance forms regarding access												
M_NLO maintain (recognize / knowledge level) access (rekey locks, cut new keys, etc.)												
M_NLO maintain (knowledge level) security and access records (video, written logs, etc.)												
M_NLO verify (examine / knowledge) security of access (door locks, self closing door operation, etc.)												
M_NLO identify (knowledge level) appropriate personnel for tenant/occupant training												
M_NLO document (record / knowledge level) completed tenant/occupant training												
M_NLO define (knowledge level) risks associated with building operations												
M_NLO restock (tabulate / knowledge level) following inclement weather incidents												
BOP SLOs New Learning Objectives Existing Learning Objectives Existing Learning Obj w Modify	Build	ding Mai	ntenance	Bldg	Systems	Manag	ement	Contra	act Mana	🕂	-	Þ
nation and press ENTER or choose Paste					COUNT	: 166	⊞ [	8		-	-+ 1	00%

The same process should be applied to all the categories. The Building Systems Management category is shown here.

	А	В	С	D	E	F	G	Н	1
1	Building Systems Management Related Learning Objectives								
2	112. BSM_NLO demonstrate (knowledge level) knowledge of regulatory requirements for data recordkeeping								
3	242. BSM_NLO demonstrate (knowledge level) knowledge of root cause analysis methods and techniques								
4	511. BSM_NLO identify (knowledge level) rebates and incentives								
5	558. BSM_NLO demonstrate (knowledge level) knowledge of local water requirements and restrictions								
6	96. BSM_NLO describe (comprehension level) the expected life of major building components								
7	306. BSM_NLO coordinate (application level) non-normal facility operations								
8	312. BSM_NLO adjust (application level) to utility shut downs								
9	462. BSM_NLO ensure (application level) maintenance of hot water and steam systems								
10	465. BSM_NLO maintain (application level) the primary sewage and gray water systems								
	+ Existing Learning Objectives Existing Learning Obj w Modify Building Maintenance Bldg Systems Management O	Contract M	anagement	🕀	: (			Þ	
RE	ADY				₩ 8		-	+ 1009	%





### **PROCESS GUIDE: Step 3**

## Step 3

## Rank SLOs

Re-categorize learning objectives as necessary. Re-categorization will likely occur as shown here. In this example, the contract management and project management became one, combined category.

A	В	С	D	E	F	G	4
1 Contract & Project Management Related Learning Objectives							
2							
3 30. CM_NLO describe (knowledge level) the purposes and the process for conducting orientation for service providers							
4 32. CM_NLO describe (knowledge level) how to secure the services of outside service providers (sign contracts, etc.) for a project							
5 380. CM_NLO verify (comprehension level) contractor/service providers permits							
6 381. CM_NLO verify (comprehension level) contractor/service providers insurance							
7 379. CM_NLO verify (classify / comprehension level) contractor/service providers licenses							
8 378. CM_NLO manage (application level) outside facility contractors/service providers							
9 478. CM_NLO coordinate (application level) permitting							
0 29. CM_NLO develop (synthesis level) a contractor/service provider handbook							
1 31. CM_NLO identify (create / synthesis level) criteria for selection of service providers for a project							
2 572. CM_NLO identify (create / synthesis level) contractors/service providers requirements							
3 27. CM_NLO review (critique / evaluation level) a project plan and determine the type of contract that will be needed (prescriptive or performance)							
4 28. CM_NLO review (evaluate / evaluation level) proposals or RFP responses for a project and determine the best proposal							
5							
6 89. PM_NLO analyze (analysis level) ROI							
7 90. PM_NLO conduct (analysis level) a project failure analysis							
8 91. PM_NLO analyze (analysis level) system lifecycle assessments							
9 352. PM_NLO schedule (plan / synthesis level) construction remodeling work							
0							
1	1						
2							
3							
		-					11
Bildg Systems Management     Contract & Project Management     Emergency Management     Emergency Management     Energy Management     Hazards Management	ement	La (+)	•				1
(EADY			₩ 8		-	+ 10	09
	_	_		_			

### New, combined category with all the objectives ordered as to level of learning

A	B	C	D	E	F	G	
ntract & Project Management Related Learning Objectives							
. CPM_NLO describe (knowledge level) the purposes and the process for conducting orientation for service providers							
<ul> <li>CPM_NLO describe (knowledge level) how to secure the services of outside service providers (sign contracts, etc.) for a project</li> </ul>							
CPM_NLO verify (comprehension level) contractor/service providers permits							
<ol> <li>CPM_NLO verify (comprehension level) contractor/service providers insurance</li> </ol>							
<ol> <li>CPM_NLO verify (classify / comprehension level) contractor/service providers licenses</li> </ol>							
<ol> <li>CPM_NLO manage (application level) outside facility contractors/service providers</li> </ol>							
<ol> <li>CPM_NLO coordinate (application level) permitting</li> </ol>							
. CPM_NLO analyze (analysis level) ROI							
. CPM_NLO conduct (analysis level) a project failure analysis							
. CPM_NLO analyze (analysis level) system lifecycle assessments							
. CPM_NLO develop (synthesis level) a contractor/service provider handbook							
<ol> <li>CPM_NLO schedule (plan / synthesis level) construction remodeling work</li> </ol>							
. CPM_NLO identify (create / synthesis level) criteria for selection of service providers for a project							
<ol> <li>CPM_NLO identify (create / synthesis level) contractors/service providers requirements</li> </ol>							
. CPM_NLO review (critique / evaluation level) a project plan and determine the type of contract that will be needed (prescriptive or performa	nce)						
. CPM_NLO review (evaluate / evaluation level) proposals or RFP responses for a project and determine the best proposal							
		-	-				
In Bidg Systems Management     Contract & Project Management     Emergency Management     Energy Management     Hazards Mar	agement	La (+)	•				₽
			₩ 🗉				100





### PROCESS GUIDE: Step 3

## Step 3

## Rank SLOs

Shown in column B are all of the 14 categories developed from the new learning objectives (NLO). These categories form the basis of the new modules and or courses which will be added to the building automation program.

			A			В	С	- I 🔺
1		BOP Learning Ou	tcomes (new to the Building Au	tomation Program)		Learning Outcome Categories (Updated)	Category sorting code	
2 1.	LS_NLO develop a workload a	nalyses.						
3 2.	LS_NLO develop scopes of wo	rk for building oper	ations personnel			Building Access & Security		
4 3.	BSM_NLO demonstrate how t	o determine equip	ment multipliers by evaluating t	he equipment		Building Contract & Project Management		
5 4.	LS_NLO compare staffing requ	irements to buildi	ng operations staffing benchmar	ks		Building Emergency Management		
6 5.	LS_NLO demonstrate a knowle	edge of labor contr	act agreements			Building Energy Management		
7 6.	LS_NLO demonstrate a knowle	edge of staffing mo	dels for building operations			Building Hazard & Risk Management		
8 7.	LS_NLO analyze staffing produ	uctivity				Building Inspections		
9 8.	LS_NLO be demonstrate how	to compare actual v	vork order hours to estimated w	ork order hours		Building Labor & Staffing		
10 <b>9.</b>	LS_NLO evaluate the quality of	of staff work				Building Maintenance - General		
11 <b>10.</b>	LS_NLO compare productivity t	to operations plans				Building Maintenance - Systems		
12 <b>12.</b>	BM_NLO analyze deferred mai	ntenance backlogs	and develop a plan to address th	nem		Building Planning		
13 <b>24.</b>	LS_NLO demonstrate knowled	ge of various trade	and union requirements for trad	lespersons		Building Sustainability		
14 27.	CM_NLO review a project plan	and determine the	type of contract that will be nee	eded (prescriptive or performance)		Building Tenant Training		
15 28.	CM_NLO review proposals or R	FP responses for a	project and determine the best	proposal		Building Weather Event Management		
16 <b>29.</b>	CM_NLO develop a contractor/	service provider h	indbook			Building Work Orders Management		
17 30.	CM_NLO describe the purpose	s and the process f	or conducting orientation for ser	vice providers				
18 31.	CM_NLO identify criteria for se	election of service	providers for a project					
19 <b>32.</b>	CM_NLO describe how to secu	re the services of o	utside service providers (sign co	ntracts, etc.) for a project				
20 34.	BM_NLO Update procedures (S	OPs, BOPs, operati	ng plans, emergency plans, etc.)					
21 35.	BM_NLO evaluate building use	changes						
22 <b>42.</b>	ENM_NLO update emergency of	operating procedur	es					
23 <b>43.</b>	ENM_NLO update disaster reco	overy plans						
24 44			Fuiting Languine Objections	(Autor)	Dullation According to Con-			
4	BOP SLOs New Lea	rning Objectives	Existing Learning Objectives	Existing Learning Obj w Modify	Building Access & Se	curity Building (+) E 4		Þ





### **PROCESS GUIDE: Step 4**

## Step 4 Design Modules

We now have the skeleton of a module of instruction. The BOP learning objectives which require new curriculum are now in 14 separate categories. These categories will form the basis of individual modules of instruction. Shown here is the Building Inspections category which is to become a module.

	А	В	<b>^</b>
1		Building Inspections Related Learning Objectives	
2	Order of instruction		
3	1	181. BM_NLO demonstrate (knowledge level) knowledge of inspection procedures	
4	2	180. BM_NLO demonstrate (knowledge level) knowledge of inspection agencies	
5	3	179. BM_NLO demonstrate (knowledge level) knowledge of typical authorizes having jurisdiction	
6	4	182. BM_NLO demonstrate (knowledge level) knowledge of the operational impact of inspections	
7	5	172. BM_NLO describe (knowledge level) how to schedule inspections with internal staff affected	
8	6	168. BM_NLO describe (knowledge level) how to schedule third party inspections	
9	7	174. BM_NLO describe (knowledge level) how to communicate with building tenants regarding inspection requirements	
10	8	173. BM_NLO verify (interpret / application level) safety for inspectors (hazards, etc.)	
11	9	171. BM_NLO describe (knowledge level) ways to participate in inspections (escort the inspector, etc.)	
12	10	175. BM_NLO describe (knowledge level) how to communicate results with parties	
13	11	169. BM_NLO prepare (comprehension level) equipment for inspections (shut down, etc.)	
14	12	170. BM_NLO operate (comprehension level) equipment for inspections (elevator recall, etc.)	
15	13	177. BM_NLO address (modify / application level) deficiencies identified during inspections	
16	14	176. BM_NLO analyze (analysis level) the results of inspections	
17	15	178. BM_NLO coordinate (solve / application level) re-inspections	
18			-
4	Building Access &	Security 🛛 Building Emergency Management 🔄 Building Energy Management 🔄 Building Inspections 🔤 Building Maintenance 🛄 💮 :	Þ
READ			130%

## Step 4 Design Modules

The Building Inspections module is now broken up into sections and ordered as to logical progression of instruction.

1			
		Building Inspections Related Learning Objectives	
2	Order of instruction		Instructional Design
3	1	181. BM_ NLO demonstrate (knowledge level) knowledge of inspection procedures	Preparing for the inspection
4	2	180. BM_NLO demonstrate (knowledge level) knowledge of inspection agencies	
5	3	179. BM_ NLO demonstrate (knowledge level) knowledge of typical authorizes having jurisdiction	
6	4	182. BM_ NLO demonstrate (knowledge level) knowledge of the operational impact of inspections	
7	5	172. BM_NLO describe (knowledge level) how to schedule inspections with internal staff affected	
8	6	<ol> <li>BM_ NLO describe (knowledge level) how to schedule third party inspections</li> </ol>	
9	7	174. BM_ NLO describe (knowledge level) how to communicate with building tenants regarding inspection requirements	
10	8	173. BM_NLO verify (interpret / application level) safety for inspectors (hazards, etc.)	
11	9	171. BM_ NLO describe (knowledge level) ways to participate in inspections (escort the inspector, etc.)	Conducting the inspection
12	10	<ol> <li>BM_ NLO prepare (comprehension level) equipment for inspections (shut down, etc.)</li> </ol>	
13	11	170. BM_NLO operate (comprehension level) equipment for inspections (elevator recall, etc.)	
14	12	175. BM_NLO describe (knowledge level) how to communicate results with parties	After the inspection
15	13	176. BM_NLO analyze (analysis level) the results of inspections	
16	14	177. BM_NLO address (modify / application level) deficiencies identified during inspections	
17	15	178. BM_NLO coordinate (solve / application level) re-inspections	
18			
19			
20			
21			
	Building Act	cess & Security Building Emergency Management Building Energy Management Building Inspections Building Maintenance	+ : •
READ	Ŷ		■ ■ ■+ 11





### **PROCESS GUIDE: Step 4**

### Step 4

### Design Modules

The specific topics and subtopics of instruction are now added which support the original student learning of the BOP. An introduction is often used to give a broad overview of the material. Highlighted colors demonstrate carry-over from related learning objectives.

1	Building Inspections Related L	Learning Objectives	
2	Instructional Design		Module Content
3	Preparing for the inspection	181. BM_ NLO demonstrate (knowledge level) knowledge of inspection procedures 1.0.0: Introduction	n
4		180. BM_ NLO demonstrate (knowledge level) knowledge of inspection agencies 1.10 Need tor inspec	otions
5		179. BM_ NLO demonstrate (knowledge level) knowledge of typical authorizes having jurisdiction 1.2.0 Hequirements of 1.2.0 Hequireme	of Inspections
6		182. BM_ NLO demonstrate (knowledge level) knowledge of the operational impact of inspections 1.3.0 Benefits of Insp	pections
7		172. BM_ NLO describe (knowledge level) how to schedule inspections with internal staff affected 2.U.U: Inspection I	Process
3		<ol> <li>BM_ NLO describe (knowledge level) how to schedule third party inspections</li> <li>U: What Happens</li> </ol>	s in an Inspection?
Э		174. BM_ NLO describe (knowledge level) how to communicate with building tenants regarding inspection require 2.1.1: Urder of Ever	nts
)		173. BM_ NLO verify (interpret / application level) safety for inspectors (hazards, etc.) 2.1.2: What is Bein	igInspected?
	Conducting the inspection	171. BM_ NLO describe (knowledge level) ways to participate in inspections (escort the inspector, etc.) 2.1.3: What are the	e Hesponsibilities of Each Party?
2		169. BM_ NLO prepare (comprehension level) equipment for inspections (shut down, etc.) 3.0.0: Who Condu	icts Inspections?
3		170. BM_ NLO operate (comprehension level) equipment for inspections (elevator recall, etc.) 3.10: Professional In	hispectors
4	Alter the inspection	175. BM_ NLO describe (knowledge level) how to communicate results with parties 3.1.1: Inspector Qu	Jalifications: Uredentials / Experience
5		176. BM_ NLO analyze (analysis level) the results of inspections 3.1.2: What inspect	ctors Look For
6		177. BM_ NLO address (modify / application level) deficiencies identified during inspections 3.1.3: Who Inspect	tors Hepresent
7		178. BM_NLD coordinate (solve / application level) re-inspections 4.0.0 Legal Jurisc	dicition and Authority
8		4.1.0 Governmental 4.1.1. Code Covernmental	Agencies
9		4.1. Code Computer	ice 
0 1		4.2.2. Consequence	es of Non-Compliance
	<ul> <li>Building Acces</li> </ul>	Building Emergency Management Building Energy Management Building Inspection	Building Maintenance (+) : 4
= ^	עס		······································
.,~	01		

This figure is taken from the workforce competency model developed from the 4 BBWG JTAs. The lower levels are foundational skills, and the skills become more specific to building energy going up the pyramid. Except for the top level of the pyramid, all the competencies shown are required of all of the BBWG jobs. Only at the top level do the skills become specific to one of the BBWG jobs. The next few pages in the example demonstrate how modules might be designed to integrate soft skills identified in the competency model.











### **Building Inspection Module Outline**

Determine how longer-term skills development will appear within each module. Each of the red-marked areas provide opportunity for skills development in the following areas of the competency model. This analysis should be done for each new module that is created:

- Workplace Competencies
- Academic Competencies
- Personal Effectiveness Competencies



6.3.2: Demonstrating Equipment Oper 6.3.3: Technical Information





### Step 4

### Design Modules

Incorporate longer-term skills

(Personal effectiveness, Academic, Workplace competencies)

Building Inspection Module Mapping to Workforce Competency Model

(Designing instruction to support longer-term skill development)

Unit	Торіс	Workforce Competency Level	Specific Competency
3.1.0	Professional Inspectors	Personal Effectiveness	Professionalism
5.2.0	Access Coordination	Workplace	Teamwork
5.3.0	Planning for Contingencies	Workplace	Planning & Organizing
6.3.1	Coordinating Equipment Shutdown	Workplace	Planning & Organizing
7.0.0	Analyzing Inspection Results	Workplace	Critical Thinking
9.1.2	Communicate Inspection Disruptions	Academic	Communication
9.1.3	Communicate Safety Issue to Tenants	Personal Effectiveness	Interpersonal Skills
9.2.1	Maintaining Written Communications	Academic	Writing
9.2.2	Documentation & Inspection Logs	Workplace	Checking, Examining, Recording
9.2.3	Scheduling Inspections	Workplace	Planning & Organizing
9.2.4	Communicate Corrective Actions	Academic	Communication
9.2.5	Communicate Known Issues	Academic	Communication

In the figure above, "Unit" refers to a unit in a community college course. The first digit is the new module that was created as a result of this example. "Workforce Competency Level" is the row in the pyramid. "Specific Competency" is a block in the row.

As shown in the next figure, it is recommended that courses be designed to integrate and reinforce several levels of the pyramid. For example, group projects can integrate personal effectiveness, academic, and workplace competencies.











### **Building Inspection Module Outline**

The learning module is now nearly complete. Hours of instruction must be assigned to each section, and fine-tuning of the outline might also occur as lesson plans are developed to support the module. This module covers BOP learning objectives 168 through 182.

1.0.0: Ir	itroduction
1.1.0	Need for Inspections
1.2.0	Requirements of Inspections
1.3.0	Benefits of Inspections
2.0.0: In	spection Process
2.1.0:	What Happens in an Inspection?
2.1.1	L: Order of Events
2.1.2	2: What is Being Inspected?
2.1.3	3: What are the Responsibilities of Each Party?
3.0.0: W	/ho Conducts Inspections?
3.1.0:	Professional Inspectors
3.1.1	I: Inspector Qualifications: Credentials / Experience
3.1.2	2: What Inspectors Look For
3.1.3	3: Who Inspectors Represent
4.0.0: Le	egal Jurisdicition and Authority
4.1.0:	Governmental Agencies
4.1.1:	Code Compliance
4.2.2:	Consequences of Non-Compliance
5.0.0: So	cheduling Inspections
5.1.0:	Required Parties
5.2.0:	Access Coordination
5.3.0:	Planning for Contingencies
6.0.0: C	onducting Inspections
6.1.0:	Ensuring Safety
6.1.1	Personal Protective Equipment Availability
6.1.2	<ol> <li>Pre-Inspection Safety Rehearsal and Walkthrough</li> </ol>
6.2.0:	Provide Access to Equipment & Spaces
6.3.0:	Equipment Inspected
6.3.1	Coordinating Equipment Shutdown
6.3.2	2: Demonstrating Equipment Operation
6.3.3	3: Technical Information

7.0.0: A	nalyzing Inspection Results
7.1.0:	Who Interprets the Results
7.1.1:	What to Look For
7.1.2:	Risk Assessment
8.0.0: C	prrective Action
8.1.0:	Prioritization
8.1.1:	Planning
8.1.2:	Execution of Corrective Measures
8.1.3:	Documentation Procedures
9.0.0: In	nportance of Communication
9.1.0:	Tenant Communication
9.1.1	: Role in Scheduling Inspections
9.1.2	2: Communicating Inspection Disruptions
9.1.3	: Communication Safety Issues to Tenants
9.1.4	I: What not to Share
9.2.0:	Communicating with Inspectors & Inspection Agencies
9.2.1	: Maintaining Written Communications
9.2.2	2: Documentation and Inspection Logs
9.2.3	: Scheduling Inspections & Re-Inspections
9.2.4	: Communicating Corrective Actions Taken
9.2.5	: Communicating Known Issues





### **DETAILED EXAMPLE: Step 4**

## Step 4 Design Modules

### Module Instruction Time

(Estimate instructional time for each module element in minutes)

Description         Description <thdescription< th=""> <thdescription< th=""></thdescription<></thdescription<>		B	c		D	E	F
Box         Mode and set in section 2         Physicity of the signed and set in se	Ruildina Insne	actions Related Learning Objectings				1 hour per week for 15 wks - 1 semester or br	3 hours per week for 15 weeks - 1
HL Ddd         Ddd <thddd< th=""> <thddd< t<="" td=""><td>containy mosper</td><td>course reading captones</td><td>Instructional Design</td><td></td><td>Module Content</td><td>Classroom Time (min.)</td><td>Standard Lab Time</td></thddd<></thddd<>	containy mosper	course reading captones	Instructional Design		Module Content	Classroom Time (min.)	Standard Lab Time
BM     ALC sensoriaris (Loudedge tree) houdege of inpection generation     100 Types of inpections     00       BK     MLC demonstrate (Loudedge tree) houdege of the operational inpact of inpections     100 Types of inpections     00       BK     MLC demonstrate (Loudedge tree) houdege of the operational inpact of inpections     100 Types of inpections     00       BK     MLC demonstrate (Loudedge tree) houdege of the operational inpact of inpections     100 Types of inpections     00       BK     MLC demonstrate (Loudedge tree) houdege of the operational inpact of inpections     100 Types of inpections     00       BK     MLC demonstrate (Loudedge tree)     00     00     00       BK     MLC demonstrate (Loudedge tr	81 RM NIO da	emonstrate (knowledge level) knowledge of inspection procedures	Prenaving for the inspection	10.0-	Introduction	Sigsifoon This philip	Standard Edd Thirt
No. Second and second prior investige inves		internative (internetige lever) internetige of inspection processies	1 repaining to the mapeoneon	110	Turse of legestices	20	
2         Mode and a set of a set	OU. DIVI_NEO UK	temonstrate (knowledge level) knowledge of inspection agencies		12.0	I gpes or inspections	50	
2. BM         110         Pergeteration for the phone         30           2. BM         110         Pergeteration for the phone         50           2. BM         110         Pergeteration for the phone         50 </td <td>73. BINE NLO US</td> <td>emonstrate [knowledge lever] knowledge or gpical admonizes having juns diction</td> <td></td> <td>12.0</td> <td>Need for inspections</td> <td>10</td> <td></td>	73. BINE NLO US	emonstrate [knowledge lever] knowledge or gpical admonizes having juns diction		12.0	Need for inspections	10	
2         BM         U.G. describes         Behaviors         B           2         BM         U.G. describes         B         B           3         BM         U.G. describes         B         <	82. BIM_ NEU de	temonstrate [knowledge level] knowledge of the operational impact of inspections		1.3.0	Hequirements or inspections	30	
B. B. M. A. Gascials Lassing La	72. BIM_ NLU de	describe (knowledge level) how to schedule inspections with internal star arrected		1.4.0	Benefits of Inspections	15	
R. BM, ALG decide f. Anorderice f. anorderice with inspection and with all inspection and inspection?         81         Nucl decide f. Anorderice f. anorder	68. BM NLO de	describe [knowledge level] how to schedule third party inspections	_	2.0.0:	Inspection Process		
13         BML AD wrisi [intergret / application level] sales (or inspector (hands, etc.)         21         0.86 or 0.8 min         30           14         MLO wrisi [intergret / application level] sales (or inspector inspector inspector (hands, etc.))         30         30           21         MLO sopia (comprehension level] sales (or inspector (hands, etc.))         30.8         Vio Conducts inspections?         30           25         ML AD sopia (comprehension level] sales (or inspector (hands, etc.))         30.8         Vio Conducts inspections?         30           26         ML AD sopia (comprehension level] sales (or inspector relations)         30.8         Vio Conducts inspections?         30           27         ML AD devis (inspector relations)         30.8         Vio Conducts inspector (hands)         30           28         ML AD devis (inspector relations)         400         43.0         Vio Inspector Sales (or inspector relations)         30           28         ML AD devis (inspector relations)         400         43.0         Vio Inspector Sales (or inspector relations)         30           28         ML AD devis (inspector relations)         400         Conducts inspector (inspector relations)         30           29         Add devis (inspector relations)         400         Conducts inspector relations)         30           20         Ad	74. BM NLO de	describe <b>[knowledge level]</b> how to communicate with building tenants regarding inspection re	equirements	2.1.0	What Happens in an Inspection?	15	
F1 HML ALL determine (particle 1 analysis legitights)         2.1         Value 18 Projection (1 and 18 Projection	73. BM_NLOve	verify (interpret / application level) safety for inspectors (hazards, etc.)		2.	11: Order of Events	30	
11. BM, L0 devole (none/devolution is performed in inspection (second the inspectin (second the inspection (second the inspection (second	67. HRM_NLO	) determine (appraise / analysis level) types of inspections needed in a given facility/buildir	ng	2.	12: What is Being Inspected?	15	
<ul> <li>B4. M.D.Greene (comprehension level) equipment of inspection (plue dow, nets)</li> <li>B4. M.G.Greene (comprehension level) equipment of inspection (plue dow, nets)</li> <li>B4. M.G.Greene (comprehension level) equipment of inspection (plue dow, nets)</li> <li>B4. M.G.Greene (comprehension level) equipment of inspection (plue dow, nets)</li> <li>B4. M.G.Greene (comprehension level) equipment of inspection (plue dow, nets)</li> <li>B4. M.G.Greene (comprehension level) equipment of inspection (plue dow, nets)</li> <li>B4. M.G.Greene (comprehension level) end (plue dow) plue dow) plue dow (plue dow)</li> <li>B4. M.G.Greene (comprehension level) end (plue dow) plue dow)</li> <li>B4. M.G.Greene (comprehension level) end (plue dow)</li> <li>B4. M.G.Greene (c</li></ul>	<ol><li>BM_NLO de</li></ol>	lescribe (knowledge level) ways to participate in inspections (escort the inspector, etc.)	Conducting the inspection	2.	1.3: What are the Responsibilities of Each Party?	30	
Die M. M. Goperate (comprection level) evolution (divudor tecal, no.)         310.         Professional inspectors (discretion evolution)         Met div inspectors (divudor tecal, no.)           BM. M. Goperate (comprections)         310.         Professional inspectors (divudor tecal, no.)         330.           BM. M. Goperate (comprections)         310.         Met div inspectors (divudor tecal, no.)         330.           BM. M. Goperate (comprections)         310.         Met div inspectors (divudor tecal, no.)         330.           BM. M. Goperate (comprections)         410.         Goperate (divudor tecal, no.)         330.           BM. M. Do cost (divudor tecal, no.)         410.         Goperate (divudor tecal, no.)         340.           BM. M. Do cost (divudor tecal, no.)         410.         Goperate (divudor tecal, no.)         340.           BM. M. Do cost (divudor tecal, no.)         610.         Bobe (divudor tecal, no.)         540.           BM. M. Do cost (divudor tecal, no.)         610.         Bobe (divudor tecal, no.)         550.           BM. M. Do cost (divudor tecal, no.)         610.         Bobe (divudor tecal, no.)         550.           BM. M. Do cost (divudor tecal, no.)         610.         Bobe (divudor tecal, no.)         550.           BM. M. Do cost (divudor tecal, no.)         610.         Bobe (divudor tecal, no.)         550. <tr< td=""><td><ol><li>69. BM_NLO pr</li></ol></td><td>prepare [comprehension level] equipment for inspections (shut down, etc.)</td><td></td><td>3.0.0:</td><td>Who Conducts Inspections?</td><td></td><td></td></tr<>	<ol><li>69. BM_NLO pr</li></ol>	prepare [comprehension level] equipment for inspections (shut down, etc.)		3.0.0:	Who Conducts Inspections?		
St. BM, ND describe (Insolved sector) in tracking of particular interaction of particular interactin of particular interaction of particular interactio	70. BM_ NLO op	operate (comprehension level) equipment for inspections (elevator recall, etc.)		3.1.0	Professional Inspectors (Inspector guest lecture)		
55. BM, DA analger (analgers level) in interaction integretoring integrations integretoring integration integrati	75. BM_ NLO de	describe (knowledge level) how to communicate results with parties	After the inspection	3.	11: Inspector Qualifications: Credentials / Experience	30	
7. EM_NDL address famories 4 application level / re-inspections     0.3. 'Un inspector Represent     90       7. EM_NDL address famories 4 application level / re-inspections     0.0.     0.0.       8.M_NDL address famories 4 application level / re-inspections     0.0.     0.0.       8.M_NDL address famories 4 application level / re-inspections     0.0.     0.0.       8.M_NDL address famories 4 application level / re-inspections     0.0.     0.0.       9.M_NDL address famories 4 application level / re-inspections     0.0.     0.0.       9.M_NDL address famories 4 application level / re-inspections     0.0.     0.0.       9.M_NDL address famories 4 address fam	76. BM NLO an	analize fanalusis level) the results of inspections		3.	12: What Inspectors Look For	30	
72.       ENC MLD coordinate (solver / application level) re-inspections       9         41.00       Code Compliance       9         42.0       Code Compliance       9         43.00       Code Compliance Solve       9         43.00       Code Compliance Solve       9         44.00       Code Compliance Solve       9         45.00       Environs Protective Explorent Availability       15         45.00       Environs Protective Explorent Availability	77. BM NLO ac	address (modify / application level) deficiencies identified during inspections		3.	1.3: Who Inspectors Represent	30	
4.10.       Downmersk Agendes       90         4.20.       Code Compliance       91         4.30.       Consequences of Non-Compliance       91         4.30.       Assess Consequences of Non-Compliance       91         5.30.       Assess Consequences of Non-Compliance       91         5.30.       Assess Consequences       91         5.30.       Assess Consequences of Non-Compliance       91         6.30.       Consequences of Non-Compliance       91         6.30.       Repair Sector Consequences of Non-Compliance Sector No	78 BM NI 0 cc	coordinate (solve / application level) re-inspections		400	Legal Jurisdicition and Authority		
4.20.         Code Compliance         65           4.20.         Code Compliance         56           4.30.         Consequences of Non-Compliance         56           5.00.         Subding Inspections         56           5.00.         Subding Inspections         56           5.00.         Acress Coordination         50           5.00.         Acress Coordination         50           6.00.         Conducting Inspection         50           6.00.         Conducting Inspection         50           6.10.         Ensuing Stells         50           6.10.         Enstender Information         50				410	Bovernmental Agencies	30	
4.30     Consequences Mono-Compliance     9       8.00     Scheddling supervisor     9       8.00     Required Parlies     9       8.00     Required Parlies     9       8.00     Required Parlies     9       8.00     Required Parlies     9       8.00     Conducting Inspections     9       8.01     Personal Protective Equipment Availability (Student exercise)     9       8.02     Constanting Equipment Student exercise)     9       8.03     Equipment Student (Speation Conducting Inspection Cond				420	Code Compliance	45	
B.0.0     Scheding haspections     I       50.0     Scheding haspections     I       51.0     Access Coordination     IS       52.0     Access Coordination Single Previous Process Proc				420	Consequences of Non Compliance	15	
Image: Section of Paris Section Sectin Section Sectin Section Section Section Section Section Section S				F 0.0.	Consequences or non-compliance Scheduling Inspections	15	
S2.0         Adors Coardson         F           5.0.0         Faming of Contempore         600           5.0.0         Conducting Inspection         600           6.0.0         Conducting Inspection         600           6.0.0         Conducting Inspection         600           6.0.0         Conducting Inspection         600           6.0.0         Conducting Inspection         600           6.0.1         Personal Protocoles (Suppored Valibity)         600           6.0.1         Personal Protocoles (Suppored Valibity)         600           6.0.1         Personal Protocoles (Suppored Valibity)         600           6.0.2         Condunity Specified         600           6.0.1         Condunity Specified         600           6.0.2         Equipment Support         600           6.0.2         Equipment Support         600           6.0.2         Condunity Specified Feature         600           7.0.0         Adors Inspection Feature         600           7.0.0         Materia Context Context Specified Feature         600           7.0.0         Materia Context Specified Feature         600           7.0.0         Materia Context Specified Feature         600           7				5.0.0.	Desired Daties	98	
41.0         First Stock Chainon         0           41.0         First Stock Chainon         00           41.0         Conducting Inspections         00           61.0         Example Sketty         50           61.1         Example Sketty         50           61.1         Example Sketty         50           61.1         Example Sketty         50           61.2         Preinspection Sketty Gegment Availability         50           61.3         Textmic Information         50           61.4         Provide Availability Gegment Availability         50           61.5         Decompressing Gegment Availability         50           61.5         Orthold Notes Statty         50           61.5         Orthold Notes Statty         50 <tr< td=""><td></td><td></td><td></td><td>5.0.0</td><td>required Fairles</td><td>15</td><td></td></tr<>				5.0.0	required Fairles	15	
S.11         Fascing/of C.Congregoties         Bot           6.0         Constant (Specifies)         File           6.11         Personal Processive Segrement Availability         File           6.12         Personal Processive Segrement Availability         File           6.13         Personal Processive Segrement Availability         File           6.14         Personal Processive Segrement Availability         File           6.20         Provide Access to Equipment Availability         Sile           6.20         Provide Access to Equipment Availability         Sile           6.20         Provide Access to Equipment Availability         Sile           6.31         Condinating Equipment Systemator         Sile           6.32         Demonstrating Equipment Systemator         Sile           6.33         Technick Information         Sile           7.30         Provide Access to Equipment Systemator         Sile           7.30         Priot Lock For         Sile         Sile           7.30         Priot Lock For				0.2.0	C Access Coordination	10	
Control         Control         State				C 0.0.0	Conduction Internation of	60	
1.0.         Educing Servity         10           1.1.         Educing Servity         10           1.1.         Provide Access to Equipment Availability         10           1.2.         Provide Access to Equipment Availability         10           1.2.         Provide Access to Equipment Services         10           1.2.         Provide Access to Equipment Services         10           1.3.         Coordinating Equipment Services         10           1.3.         Not Reports the Results         10           1.3.         Not Response the Results         10           1				6.0.0:	Conducting inspections		
8.18     Percent Availability     P       9.19     Percent and Protective Explant Availability     P       9.10     Percent Availability				6.1.0	Ensuring sarety	15	
61.2       PreIntpretion Safety Brienza and Valkhirough (student exercise)       000000000000000000000000000000000000				6.	11: Personal Protective Equipment Availability	15	
62.0. Provide Access to Equipment Signaces         30           63.0. Expriment Signaces         30           63.1. Coordinating Equipment Signaces         30           63.2. Demonstrating Equipment Signaces         30           70.0. Provide Access to Equipment Signaces         30           71.0. Vin Instructed The Results         30           72.0. Vinat Look Kor         30           73.0. Risk Assessment         30           8.0.9. Corrective Action         50           8.0.9. Corrective Messares         50           8.0.9. Corrective Messares         50           8.0.9. Corrective Messares         50           8.0.9. Corrective Messares         50           8.0.9. Demonstration Procedure Extrementation         50				6.	<ol> <li>Pre-Inspection Safety Rehearsal and Walkthrough (student exercise)</li> </ol>		90
6.3.0     Equipment happended       6.3.1     Equipment happended     30       6.3.3     Technical high Equipment Shardboom     30       6.3.3     Technical high Equipment Shardboom     30       7.0.0     Analyzing Imprese tion Results     30       7.10     Woot Interpretes the Results     30       7.20     Whot Interpretes the Results     30       7.20     Prioritization     30       8.30     Execution of Corrective Measures     30       8.30     Execution of Corrective Measures     30       8.40     Documentation Proceedures (Statest escreise)     30				6.2.0	E Provide Access to Equipment & Spaces	30	
6.3.     Coordinating Equipment Operations     00       6.3.2.     Demonstrating Equipment Operations     00       6.3.3.     Technical Information     00       7.0.0.     Analgoin (ingree/colon Results)     90       7.0.0.     Youth Color Stratistic     90       8.0.0.     Concentratistic Processing Estimation Procesing Estimation Procesing Estimation Processing Estimation P				6.3.0	Equipment Inspected		
6.3.2     Demonstrating Supervisor (Speration     90       6.3.3     Technical Information     90       7.0.0:     Analgring Inspection Results     90       7.10.1:     On Interprets the Results     90       7.10.1:     Nation Interprets the Results     90       7.10.2:     Mast Look For     90       7.2.0:     Mast Look For     90       7.2.0:     Mast Look For     90       7.2.0:     Mast Look For     90       8.0.1:     Corrective Action     90       8.0.2:     Corrective Action     90       8.0.2:     Flanning     90       8.0.3:     Flanning     90       8.0:1:     Flanning     90				6.	3.1: Coordinating Equipment Shutdown	30	
6.3.3     Toelvise Information     90       7.00.     Analgring Imprestion Results     30       7.10.     Vino Interprets the Results     30       8.0.0     Concentiere Action     50       8.0.0     Concentiere Action     50       8.0.0     Concentiere Interprets the Results     50       8.0.0     Execution of Corrective Measures     50       8.0.0     Concentiation Procedure I Student exercise)     50				6.	3.2: Demonstrating Equipment Operation	30	
7.0.0:         Analing Inspection Results				6.	3.3: Technical Information	30	
7.10.     Vino.tireprise the Fearlies     30       7.20.     Vino.tireprise the Fearlies     30       7.20.     Risk.Assessment     30       8.00.     Risk.Assessment     30       8.00.     Filter Autoin     50       8.00.     Consentation Proceedures (student exercise)     50       8.00.     Communitation Proceedures (student exercise)     50				7.0.0:	Analyzing Inspection Results		
72.0. What to look For     30       73.0. Pisk Assessment     30       8.0.9. Corrective Action     50       8.0.9. Corrective Action     50       8.0.9. Corrective Action     50       8.0.9. Execution of Corrective Measures     50       8.0.9. Execution of Corrective Measures     50       8.0.9. Execution of Corrective Generative Executions     50       8.0.9. Execution of Corrective Generative Executions     50       8.0.9. Execution of Commentation Procedures (student exercise)     50				7.1.0	Who Interprets the Results	30	
7.30. Risk Assessment     30       8.9.0. Corrective Action     5       8.10. Prioritization     15       8.20. Phaning     5       8.20. Decomposition of Corrective Measures     30       8.30. Execution of Corrective Measures     30       8.40. Documentation Procedures (structed textrcise)     30       9.10. Importance of Communication     5				7.2.0	What to Look For	30	
8.0.9:     Corrective Action       8.10.     Filomitization       8.10.     Filomitization       8.20.     Filomitization       8.30.     Execution of Corrective Measures       8.40.     Documentation Procedure (student exercise)       9.0.9.     Filomitization				7.3.0	E Risk Assessment	30	
8.10     Prioritization     15       8.2.0     Paraning     15       8.10     Execution of Corrective Measures     50       8.10     Execution of Constructive Statutes testicise)     50       8.0.0     Importance of Communication     50       9.10     Importance of Communication     51				8.0.0:	Corrective Action		
8.20. Planning     15       8.20. Execution of Corrective Measures     16       8.20. Execution of Corrective Measures     30       8.40. Documentation Procedures (student exercise)     30       9.00. Importance of Communication     30				810	Prioritization	15	
8.10 Execution of Connective Measures     8.40 Documentation Proceeding Estudies exercise)     8.40 Documentation Proceeding Estudies exercise)     9.40 - Importance of Communication     9.410 - Importance information				820	Planning	15	
8.0. Documentation Procedure (student exercise) 8.0.9: Importance of Communication 9.10: Tapato Communication				830	Execution of Corrective Measures	30	
9.0.9 Importance of Communication				840	Documentation Procedures (student exercise)	~	90
S10-Tensor Commission				9 8 8.	Importance of Communication		
				910	Tanant Communication		
41.1 Data Contractioner 15				3.1.0	11. Dals in Caledulina Increations	15	
Othermodeling inspections     10				3.	Communicating Inspection	15	
3.1.2: Communicating inspection Lissuppions 15			_	9.	Le: Communicating inspection Disruptions	6	
🕨 Building Energy Management 🛛 Bldg. Hazard & Risk Mgmt. 🛛 Building Inspections 🔤 Bldg. Labor & Staffing 🔤 Building Maintenance - General 🔐 🕂 💽		Building Energy Management Bldg. Hazard & Risk Mgmt.	Building Inspections	Bldg	g. Labor & Staffing Building Maintenance - Genera	al (+) : 🖪	

### Step: Calculate Module Credit Hours – Semester Basis



Classroom conversion 1 hr./week for 15 weeks = 1 credit hour (900 min./semester = 1 credit hour) Laboratory conversion 3 hr./week for 15 weeks = 1 credit hour (2700 min./semester = 1 credit hour)





### DETAILED EXAMPLE: Step 4

## Step 4 Design Modules

Step: Collect & Organize Modules into Courses (Example of 4 modules collected into one course)

#### **Collecting Modules into Courses**

Module Name	Credit Hours	BOP Quantity of SLOs Covered	Lab Component	Order
Bldg. Hazards & Risk Mgmt	1.09	44	Yes	1
Building Inspections	1.11	16	Yes	2
Building Labor & Staffing	0.4	10	No	3
Building Tenant Training	0.4	8	No	4
TOTALS:	3.0	78	Yes	

#### Proposed Course Name: Building Operations Management 1

The figure above shows modules that have been collected in a course. It shows the quantity of credit hours, the quantity of BBWG SLO's, whether a module has a lab component, and the order of instruction for each module. It also shows that the modules add up to 3 credit hours, a common length for a college course.







### **DETAILED EXAMPLE: Step 5**

## Step 5 Design Courses

### Step: Collect & Organize Modules into Courses

(4 Modules become course Building Operations Management 1 – SLOs shown here)

#### Hazards & Risks Module SLOs

8	147.	HRM_NLO train (teach / application level) staff on hazards and PPE requirements
9	148.	HRM_NLO train (teach / application level) staff on limitations of PPE
10	150.	HRM_NLO test (application level) staff on use of PPE for correct usage
11	152.	HRM_NLO conduct (application level) a fit test of PPE
12	160.	HRM_NLO document (synthesis level) a PPE program
13	151.	HRM NLO set up (evaluation level) medical evaluations for some PPE (Respirators, etc.)
14	159.	HRM_NLO certify (evaluation level) the PPE equipment on an annual basis
15	162.	HRM_NLO demonstrate (knowledge level) knowledge of hazards management
16	163.	HRM_NLO demonstrate (knowledge level) knowledge of HIPAA requirements
17	164.	HRM_NLO demonstrate (knowledge level) knowledge of proper procedures for isolating and removing hazards
18	199.	HRM_NLO demonstrate (knowledge level) knowledge of hazard remediation and clean up
19	200.	HRM_NLO demonstrate (knowledge level) knowledge of hazardous materials disposal
20	201.	HRM_NLO demonstrate (knowledge level) knowledge of potential environmental health and safety (EHS) hazards and risks
21	234.	HRM_NLO participate (analysis level) in the development of a hazard vulnerability analysis
22	240.	HRM_NLO review (analysis level) hazard vulnerability analyses and update them as required
23	237.	HRM_NLO develop (synthesis level) action plans for hazard risks
24	121.	HRM_NLO create (evaluation level) job hazard analyses reports
25	241.	HRM_NLO demonstrate (knowledge level) basic knowledge of insurance policies for equipment and operations
26	474.	HRM_NLO describe (knowledge level) how to comply with infection control risk assessments
27	232.	HRM_NLO define (knowledge level) risks associated with building operations
28	231.	HRM_NLO conduct (recommend, score / evaluation level) risk management activities
29	233.	HRM_NLO assess (evaluation level) risks associated with building operations
30	235.	HRM_NLO manage (assess / evaluation level) utility system risk and vulnerability
31	238.	HRM_NLO identify (assess / evaluation level) external resources required for risk management
32	239.	HRM_NLO coordinate (evaluate / evaluation level) management of external resources required for risk management
33	161.	HRM_NLO demonstrate (knowledge level) knowledge of decontamination requirements
34	356.	HRM_NLO demonstrate (knowledge level) knowledge of when to conduct IEQ tests
35	357.	HRM_NLO demonstrate (knowledge level) knowledge of contaminant containment protocols
36	358.	HRM_NLO demonstrate (knowledge level) knowledge of health effects of contaminants (including stay times)
37	475.	HRM_NLO identify (knowledge level) environmental issues (asbestos, VAT, ACMs, lead paint, etc.)
38	480.	HRM_NLO (knowledge level) identify sustainable materials (low VOC, etc.)
39	346.	HRM_NLO describe (comprehension level) how to control chemicals brought into the workplace
40	251	WDM_NLO decerbs fearmashanelan lawall how to accord the use of law VOC exists

#### Inspections Module SLOs

8	173. BM_ NLO verify (interpret / application level) safety for inspectors (hazards, etc.)
9	167. HRM_NLO determine (appraise / analysis level) types of inspections needed in a given facility/building
10	171. BM_NLO describe (knowledge level) ways to participate in inspections (escort the inspector, etc.)
11	169. BM_NLO prepare (comprehension level) equipment for inspections (shut down, etc.)
12	170. BM_NLO operate (comprehension level) equipment for inspections (elevator recall, etc.)
13	175. BM_NLO describe (knowledge level) how to communicate results with parties
14	176. BM_NLO analyze (analysis level) the results of inspections
15	177. BM_NLO address (modify / application level) deficiencies identified during inspections

#### Labor & Staffing Module SLOs

		-				
3	3 24. LS_NLO demonstrate (knowledge level) knowledge of various trade and union requirements for tradespersons					
4	4.	LS_NLO compare (analysis level) staffing requirements to building operations staffing benchmarks				
5	10.	LS_NLO compare (analysis level) productivity to operations plans				
6	7.	LS_NLO analyze (analysis level) staffing productivity				
7	2.	LS_NLO develop (synthesis level) scopes of work for building operations personnel				
8 573. L5_NLO identify (plan / synthesis level) staffing requirements for future service activities						
9	1.	LS_NLO develop (synthesis level) a workload analyses.				
<ol> <li>9. LS_NLO evaluate (evaluation level) the quality of staff work</li> </ol>						
Tenant	Tr	aining Module SLOs				

2	222.	BM_NLO identify (analyze / analysis level) training topics for tenant/occupant training
3	223.	BM_NLO identify (assess / evaluation level) knowledge levels of tenants/occupants
4	224.	BM_NLO develop (synthesis level) and update tenant/occupant training programs
5	227.	BM_NLO coordinate (prepare / application level) training with tenant/occupant management
6	228.	BM_NLO document (record / knowledge level) completed tenant/occupant training
7	225.	BM_NLO schedule (teach / application level) and conduct tenant/occupant training
8	229.	BM_NLO evaluate (evaluation level) the success of tenant/occupant training





### **DETAILED EXAMPLE: Step 5**

## Step 5 Design Courses

#### Building Operations Management 1 – Hazards & Risks Module

	1 hour per week for 15 wks = 1 semester cr hr	3 hours per week for 15 weeks = 1 semester cr hr
Module Content	Classroom Time (min.)	Standard Lab Time (min.)
1.0.0: Introdution		
1.1.0: PPE Overview	15	
1.2.0: Hazards Overview	15	
1.3.0: Risk Management Overview	15	
1.4.0: Indoor Environmental Quality Overview	15	
1.5.0: The Need to Control Risks & Hazards	30	
2.0.0: PPE		
2.1.0: PPE Fundamentals		
2.1.1: When to use PPE	30	
2.1.2: How to use PPE (student exercise)		90
2.1.3: PPE Requirements	30	
2.2.0: Managing PPE		
2.2.1: Meeting Regulations	15	
2.2.2: Testing PPE	15	
2.2.3: Training Staff on PPE	60	
2.2.4: Documenting PPE	30	
2.2.5: Development of PPE Program	30	
2.2.6: Evaluating PPE	30	
.0.0: Hazards Management		
3.1.0: Hazards Fundamentals		
3.1.1: Hazards Definition & Classes	30	
3.1.2: Identification of Hazards	30	
3.1.3: Hazards Inspections (student exercise)	15	45
3.2.0: Hazardous Materials		
3.2.1: Classes of Hazardous Materials	15	
3.2.2: Hazardous Materials Documentation (student exercise)	15	45
3.2.3: Hazardous Materials Exposure	15	
3.2.4: Hazardous Materials Clean Up	30	
3.3.0: Controlling Hazards		
3.3.1: Vulnerability Analysis	15	
3.3.2: Action Plan Development	30	
3.3.3: Hazards Emergency Plan	15	
3.3.4: Hazards Documentation & Reporting	30	
0.0: Risk Management		
4.1.0: Risk Management Fundamentals		
4.1.1: Risks Definition	15	
4.1.2: Risks Identification	15	
4.1.3: Risks Inspections	15	
4.2.0: Classes of Building Risk		
4.2.1: Intection Control Hisks	15	
4.2.2: Building Operations Risks	15	
4.2.3: Outry systems wass	15	
4.3.0: Insuring Against Kisk	11	
4.3.2. Pick Assessments (shadow assessments)	15	
4.3.2: Nisk Assessments (student exercise)	15	45
4.3.3: Hisk Management roots	30	
4.3.4: Kisk vulnerability Analysis	15	
LLC Indoor Environmental Quality		
5.1.0: TEQ Fundamentars		
5.1.1: its uper inition	15	
5.1.2: Inc.; mean of biffects & issues	60	
5.1.3: Contaminant Definitions	15	
5.2.0: TEU Categories		
5.2.1: VOCs	15	
5.2.2: Asbestos, ACMs	15	1

#### **Building Operations Management 1 –** Building Inspection Module

	1 hour per week for 15 wks = 1 semester cr hr	3 hours per week for 15 weeks = 1 semester cr hr
Module Content	Classroom Time (min.)	Standard Lab Time (min.)
1.0.0: Introduction		
1.1.0 Types of Inspections	30	
1.2.0 Need for Inspections	15	
1.3.0 Requirements of Inspections	30	
1.4.0 Benefits of Inspections	15	
2.0.0: Inspection Process		
2.1.0: What Happens in an Inspection?	15	
2.1.1: Order of Events	30	
2.1.2: What is Being Inspected?	15	
2.1.3: What are the Responsibilities of Each Party?	30	
3.0.0: Who Conducts Inspections?		
3.1.0: Professional Inspectors (Inspector guest lecture)		
3.1.1: Inspector Qualifications: Credentials / Experience	30	
3.1.2: What Inspectors Look For	30	
3.1.3: Who Inspectors Represent	30	
4.0.0: Legal Jurisdicition and Authority		
4.1.0: Governmental Agencies	30	
4.2.0: Code Compliance	45	
4.3.0: Consequences of Non-Compliance	15	
5.0.0: Scheduling Inspections		
5.1.0: Required Parties	15	
5.2.0: Access Coordination	15	
5.3.0: Planning for Contingencies	60	
6.0.0: Conducting Inspections		
6.1.0: Ensuring Safety	15	
6.1.1: Personal Protective Equipment Availability	15	
6.1.2: Pre-Inspection Safety Rehearsal and Walkthrough (student exercise)		90
6.2.0: Provide Access to Equipment & Spaces	30	
6.3.0: Equipment Inspected		
6.3.1: Coordinating Equipment Shutdown	30	
6.3.2: Demonstrating Equipment Operation	30	
6.3.3: Technical Information	30	
7.0.0: Analyzing Inspection Results		
7.1.0: Who interprets the Results	30	
7.2.0: What to Look For	30	
730 Rick Accessment	30	
8.0.0: Corrective Action		
8.1.0: Prioritization	15	
82.0: Planning	15	
830: Execution of Corrective Measures	30	
8.4.0: Documentation Procedures (student exercise)		91
9.0.0: Importance of Communication		
910 Tenant Communication		
9.1.1: Pole in Scheduling Incontinue	16	
9.1.2 Communication Inspection Disputions	15	
9.1.3: Communication Safety Issues to Tenants	15	
9.1.4: What not to Share	15	
9.2.0: Communication with Increastors & Increastion Appendias	15	
9.2.1: Molectaiolog Moltan Communications	20	
0.2.2. Desume shallon and loss shire ( as (shudesh are relea))	30	120
5.2.2. Documentation and inspection cogs (student exercise)		120

### Building Operations Management 1 – Labor and staffing module

	1 hour per week for 15 wks = 1 semester cr hr	3 hours per week for 15 wee
Module Content	Classroom Time (min.)	Standard La
1.0.0: Introduction		
1.1.0: Effective Management in Buildings		
1.1.1: Responsibilities of the Facilities Manager	15	
1.1.2: Leadership Characteristics	15	
1.1.3: Interpersonal Communications	15	
1.1.4: Written Communications	15	
1.1.5: Building Policies	30	
2.0.0: Labor in Buildings		
2.1.0: Staffing Fundamentals		
2.1.1: Building Staffing Case Studies	15	
2.1.2: Building Staffing Models	15	
2.1.3: Types of Labor in Buildings	15	
2.2.0: Rights of Labor		
2.2.1: Non-Union Labor	15	
2.2.2: Union Labor	10	
2.2.3: Labor Contracts	10	
2.2.4: Documentation	10	
3.0.0: Labor Productivity		
3.1.0: Maximizing Productivity		
3.1.1: Benchmarking Production	10	
3.1.2: Setting Production Targets	10	
3.1.3: Motivating Labor	10	
3.1.4: Identifying Lack of Production	10	
4.0.0: Labor Workloads		
4.1.0: Division of Labor	10	
4.2.0: Writing Scopes of Work	10	
4.3.0: Planning for Future Labor Needs	15	
4.4.0: Workload Analysis	15	
5.0.0: Labor Quality		
5.1.0: Management Hierarchy		
5.1.1: Chain of Command	10	
5.1.2: Required Labor Reporting	10	
5.2.0: Evaluation Metrics	10	
5.2.1: Customer Service Surveys	10	
5.2.2: Spot-Checking Work	10	
5.2.3: Building Performance Measures	10	
5.2.4. Solf Evaluation	10	
5.2.4. Sen-Evaluation 5.2.5: Performance Reviews	10	
6.0.0: Module Review	20	
7.0.0. Medule Assessment	20	

### **Building Operations Management 1 –** Tenant Training Module

	1 hour per week for 15 wks = 1 semester cr hr	3 hours per week for 15 weeks = 1 semester cr hr
Module Content	Classroom Time (min.)	Standard Lab Time (min.)
1.0.0: Introduction		
1.1.0: Importance of Tenant Training	10	
1.2.0: Tenants Impact on Building Performance	10	
1.3.0: Benefits of Tenant Relationships	10	
2.0.0: Assessing Training Needs		
2.1.0: Surveys		
2.1.1: Creating Survey Instruments	10	
2.1.2: Promoting Survey Response	10	
2.1.3: Crafting the Survey	10	
2.1.4: Analyzing Data	15	
2.1.5: Selecting Training Topics	15	
3.0.0: Training Program Development		
3.1.0: Education Principles		
3.1.1: Choosing the Right Participants	15	
3.1.2: Engaging Lessons	15	
3.1.3: Importance of Preview / Review	15	
3.1.4: Audio / Visual Aids	15	
3.1.5: Using PowerPoint Effectively	15	
3.1.6: Assessments	15	
4.0.0: Logistics		
4.1.0: Selecting the Right Training Location	10	
4.2.0: Coordination of Resources	10	
4.3.0: Documentation	10	
5.0.0: Training Delivery		
5.1.0: Training Day	15	
5.1.1: Contingency Planning	15	
5.1.2: Scheduling	15	
5.1.3: Handouts	15	
6.0.0: Training Evaluation		
6.1.0: Survey Designs	15	
6.2.0: When to Administer Surveys	15	
6.3.0: Evaluating Feedback	15	
6.4.0: Measuring Impact on Building Performance	15	
7.0.0: Module Review	30	
8.0.0: Module Assessment		





### DETAILED EXAMPLE: Step 5

## Step 5 Design Modules

(Full example shown for Bldg. Operations Management 1 - Others follow the same process)

### **Course: Building Operations Management 1**

Module Name	Credit Hours	BOP SLOs Covered	Lab Component	Order
Bldg. Hazards & Risk Mgmt	1.09	44	Yes	1
Building Inspections	1.11	16	Yes	2
Building Labor & Staffing	0.4	10	No	3
Building Tenant Training	0.4	8	No	4
TOTALS:	3.0	78	Yes	

#### Proposed Course: Building Operations Management 2

Module Name	Credit Hours	BOP SLOs Covered	Lab Component	Order
Bldg. Emergency Mgmt.	TBD	25	TBD	1
Bldg. Weather Event Mgmt.	TBD	12	TBD	2
Building Planning	TBD	28	TBD	3
Contract & Project Mgmt.	TBD	25	TBD	4
TOTALS:	3.0 approx.	90	Most Likely Yes	

The top table in the figure above has been described previously. The bottom table shows the same information as the top table, but has not been fully completed – further analysis is required to finalize credit hours and labs.





### **DETAILED EXAMPLE: Step 5**

## Step 5 Design Modules

(% related to original Building Automation Program (BAS) & % related to program with new course additions)

## % of BOP Student Learning Objectives (SLO) covered in example BAS program

Total BOP SLOs	BOP SLOs existing in BAS	BOP SLOs closely related to BAS	BOP SLOs new to BAS
590	194	85	311

Percent Related on SLO Basis Common to Both: 47.3%

## % of BOP Student Learning Objectives covered in example BAS program w/ added courses

Total BOP SLOs	BOP SLOs existing in BAS	BOP SLOs closely related to BAS	BOP SLOs new to BAS		
590	194	85	311		
Percent Related on SLO Basis Common to Both: 100.0%					

\* Note: Fully aligning the example BAS program to the BOP JTA would require the addition of 4 courses to the program. This could be accomplished by creating a new credit-based program, using the BAS program as a base or simply by adding electives and/or workforce development courses.

Identifying post-programmatic training opportunities would be the final step and could be undertaken once a BOP credential emerges which further outlines depth and breadth of SLO skills.





### **DETAILED EXAMPLE: Step 5**

#### Step 5 **Design Courses** (Building Operations Maintenance 1 & 2) Course: Building Operations Management 1: General BOP Lab Module Name **Credit Hours** SLOs Covered Order Component Access & Security TBD 17 TBD 1 Work Orders Mgmt. TBD 16 TBD 2 Bldg. Maintenance - General TBD 49 TBD 3 TOTALS: 82 **Most Likely Yes** 3.0 approx. Proposed Course: Building Operations Management 2: Building Systems BOP Lab Module Name **Credit Hours** SLOs Covered Component Order Bldg. Maintenance - Systems TBD 25 TBD 1 Bldg. Energy Mgmt. TBD 25 TBD 2 Bldg. Sustainable Systems TBD 11 TBD 3 TOTALS: **Most Likely Yes** 61 **3.0** approx.

The 2 tables above represent the remaining 2 courses that would need to be developed to fully address all of the BBWG SLO's, in this example program.



