
Computer Engineering Program Course Outcomes Assessment

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Course Outcomes Assessment Process

- **Each COE course has a Course Learning Outcomes Table that includes the following for each outcome:**
 - Outcome indicators and details: this describes the main course topics that will be focused on to achieve the outcome.
 - Suggested assessment methods and metrics.
 - Outcome minimum weight: this indicates the importance of the outcome in the course. It is the minimum weight from the total course score (out of 100) that must be used for assessing the outcome or covering the outcome in the course.
 - A mapping between the course learning outcome and ABET program outcomes.
 - Each outcome is given a rank as Low, High, Medium that correlates with the weight used for assessing the outcome.

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Course Outcomes Assessment Process

- **Course outcomes are assessed by course instructors both directly and indirectly.**
- **Suggested direct assessment of course learning outcomes based on using Course Learning Outcomes Evaluation Table includes the following for each outcome:**
 - **Outcome minimum weight.**
 - **Outcome weight:** this is to be filled by the instructor indicating how much weight was used by the instructor for assessing the outcome.
 - **Assessment Method:** this describes what methods were used to assess the outcome, the weight of each method, and the evidence of assessment.
 - **Class Average:** indicates the student's average performance in the outcome.

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Course Learning Outcomes Table Example (COE 205)

Course Learning Outcomes	Outcome Indicators and Details	Assessment Methods and Metrics	Min. Weight	ABET 2000 Criteria
1. Ability to analyze, design, implement, and test assembly language programs.	<ul style="list-style-type: none"> • Instruction Set Architecture • Number (unsigned and signed) and character representation • Addressing modes • Syntax, semantics, and effect on flags of Pentium instructions. • Input/output. • Arithmetic and logic operations. • Flow-control structures. • Procedures. • Macros. • String manipulation. • Interrupt mechanism. • Implementation of Pseudo code algorithms in assembly language. 	<ul style="list-style-type: none"> • Assignment • Quizzes • Exams • Project 	55%	C(H)

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Course Learning Outcomes Table Example (COE 205)

Course Learning Outcomes	Outcome Indicators and Details	Assessment Methods and Metrics	Min. Weight	ABET 2000 Criteria
2. Ability to use tools and skills in analyzing and debugging assembly language programs.	<ul style="list-style-type: none"> • Assembly language vs. machine language. • Assembling and linking assembly programs (including use of multiple files). • Use of debugger to analyze and debug programs. • Use of libraries. 	<ul style="list-style-type: none"> • Lab work 	4%	K(L)
3. Ability to design the datapath and control unit of a simple CPU.	<ul style="list-style-type: none"> • Fetch-execute cycle • Data, address and control buses • Register transfer • Data path design: 1-bus, 2-bus and 3-bus CPU. • Derivation of control steps for assembly instructions. • Hardwired Control unit design • Microprogrammed control unit design. • Fixed vs. variable instruction format. 	<ul style="list-style-type: none"> • Assignments • Quizzes • Exams 	15%	C(M)

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Course Learning Outcomes Table Example (COE 205)

Course Learning Outcomes	Outcome Indicators and Details	Assessment Methods and Metrics	Min. Weight	ABET 2000 Criteria
4. Ability to demonstrate self-learning capability.	<ul style="list-style-type: none"> Ability to learn a course topic alone (e.g. Macros) Course Project may involve topics not studied in the course 	<ul style="list-style-type: none"> Assignment Quizzes 	2%	I(L)
5. Ability to work in a team.	<ul style="list-style-type: none"> Project is divided into separate parts that will be integrated for project completion. 	<ul style="list-style-type: none"> Project 	2%	D(L)

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Course Learning Outcomes Evaluation Table Example (COE 205)

Outcome	Outcome Min. Weight	Assessment Method								Total
		Assign.	Quizz	Exam I	Exam II	Exam III	Final Exam	Lab Work	Proj.	
O1	55%	15	8	15	20			10		68
	Average	10.9	5.2	10.4	14.4			8.3		49.2 (72.4%)
	Evidence	#1-4	#1-5	Q1-4	Q1-5			Lab Exp .		
O2	4%							2		2
	Average							1.4		1.4 (70%)
	Evidence							Lab Exp .		
O3	15%						20			20
	Average						13.1			13.1 (65.5%)
	Evidence						Q1-4			

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Course Learning Outcomes Evaluation Table Example (COE 205)

Outcome	Outcome Min. Weight	Assessment Method								
		Assign.	Quizz	Exam I	Exam II	Exam III	Final Exam	Lab Work	Proj.	Total
O4	2%		2							2
	Avg.		1.56							1.56 (78%)
	Eviden.		#6							
O5	2%								8	8
	Avg.								5.8	5.8 (72.5%)
	Eviden.								Rep.	
Weight		15	10	15	20		20	12	8	100
Average		10.9	6.76	10.4	14.4		13.1	9.7	5.8	71.1

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Course Learning Outcomes Indirect Assessment Example (COE 205)

Criteria	Student Evaluation					
	E (4)	G (3)	A (2)	P (1)	NA (0)	Composite
1. As a result of this course, my ability to analyze, design, implement, and test assembly language programs can be described as,	9	7	3			3.32
2. As a result of this course, my ability to use tools and skills in analyzing and debugging assembly language programs can be described as,	2	8	8		1	2.53
3. As a result of this course, my ability to design the datapath and control unit of a simple CPU can be described as,	2	9	6	6	1	2.53
4. As a result of this course, my ability to demonstrate self-learning capability can be described as,	6	8	2	3		2.89
5. As a result of this course, my ability to work in a team can be described as,	7	9	2	1		3.16
Number of Responses: 19						

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Course Assessment Results Example (COE 205)

Section#	Source of Outcome Data	Outcome1	Outcome2	Outcome3	Outcome4	Outcome5
I	Instructor Evaluation	64.8%	48.2%	72.3%	62.8%	61.7%
	Student Survey	75%	65%	68.2%	73.3%	75%
II	Instructor Evaluation	77.8%	80.7%	70.1%	75.2%	75.2%
	Student Survey	88.25%	88.25%	69%	75%	86.8%
III	Instructor Evaluation	77.4%	86%	77.5%	78%	78.8%
	Student Survey	87%	79%	77.8%	81.5%	80.3%
Overall	Recommend.	Achieved	Needs Improv.	Needs Improv.	Achieved	Achieved

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Course Assessment Results Example (COE 205)

■ Observations:

- Outcome 2 and Outcome 5 have not been assessed directly in Section II and Section III and the lab mark has been used.
- Based on the overall assessment and instructors feedback, it seems that Outcome 2 and Outcome 3 need improvement. All Other outcomes are considered well-achieved.

■ Recommendations:

- Outcome 2 needs more emphasis in the lab and should be directly assessed by lab instructors.
- Outcome 3 can be improved by increasing the number of assignments on this part from one to two.

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Term 061 Course Outcomes Assessment

	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11
COE 202	A	NI	NA								
COE 203											
COE 205	A	NI	NI	A	A						
COE 305	A	NI	NI	A	A	A	A				
COE 308	NI	A	NI	NI	A						
COE 341	NI	A	A	NI	A						
COE 344	NA	A	NI	A	A						
COE 360	NI	A	A	NA	NA	NI					
COE 390											
COE 400											
COE 485											

A: Achieved NI: Needs Improvement NA: Not Achieved

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Term 062 Course Outcomes Assessment

	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11
COE 202	A	NI	NI								
COE 203	A	A	NI	A	A						
COE 205	A	A	A	A	A						
COE 305	A	A	A	A	NI	A	NI				
COE 308	A	A	NI	A	A						
COE 341	NI	A	NI	A	A						
COE 344	A	A	A	NI	A						
COE 360	A	A	NI	NI	A	A					
COE 390	A	A	A	A	A						
COE 400	A	A	A	NI	NI	A	A	A			
COE 485	A	A	A	A	A	A	NI	A	A	A	NI

A: Achieved NI: Needs Improvement NA: Not Achieved

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Term 071 Course Outcomes Assessment

	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11
COE 202	A	NI	NI								
COE 203	A	A	A	A	A						
COE 205	A	NI	NI	A	A						
COE 305	A	A	A	A	A	A	A				
COE 308	A	A	A	NI	A						
COE 341	NI	A	A	A	A						
COE 344	NA	A	NI	A	A						
COE 360	A	A	NI	A	A	A					
COE 390	A	A	A	A	A						
COE 400	A	A	A	A	NI	A	A	A			
COE 485	A	A	A	A	A	A	NI	A	A	A	NI

A: Achieved NI: Needs Improvement NA: Not Achieved

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Course Assessment Summary

- While some of the course outcomes were considered not achieved in Term 061, all outcomes in Term 062 were either Achieved or Need Improvement.
- Only one course outcome not achieved in Term 071 (COE 344).
- More outcomes are achieved in Term 062 than Term 061 and more outcomes are achieved in Term 071 than Term 062.
- Results of course assessment over the three semesters indicate corrective action resulting in improving course outcomes achievement.

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