

**Course Learning Outcomes Assessment  
Core COE Courses  
Term 071**

**Course Assessment Summary**  
**COE 202 Fundamentals of Computer Engineering (3-0-3)**  
**Term 071**

**Course Learning Outcomes**

1. Ability to use math and Boolean algebra in performing computations in various number systems and simplification of Boolean algebraic expressions.
2. Ability to design efficient combinational and sequential logic circuit implementations from functional description of digital systems.
3. Ability to use CAD tools to simulate and verify logic circuits.

Section#	Source of Outcome Data	Outcome1	Outcome2	Outcome3
1 & 3	Instructor Evaluation	74%	62%	54%
	Student Survey	83%	69%	70%
2	Instructor Evaluation	78%	63%	70%
	Student Survey	Not Available	Not Available	Not Available
Overall	Assessment Rating	Achieved	Needs Improvement	Needs Improvement

**Observations:**

1. The Instructor of section 1 & 3 observed that students did well in the first outcome and did average on the third outcome. He made a similar observation for the indirect assessment of the course outcomes.
2. The Instructor of section 1 & 3 also reported that there is an improvement in the performance of the students in all 3 outcomes of the course when comparing both the direct and the indirect assessments of the course taught in Term 071 with those of the same course he taught in Term 061. This is mainly due to giving the students more examples, homework problems, and CAD assignments that ask the students to verify the homework problems.

**Recommendations:**

1. The instructor of sections 1 & 3 recommended that more improvement can possibly be achieved by incorporating active/cooperative leaning activities in the next offering of the course.
2. The instructor of section 2 recommended that course material should be linked to real life aspects by examples and by explaining how this course provides the basis for other courses in the major. He also recommended the systematic transition between units and between lessons in the unit.

## Course Assessment Summary

### COE 203 Digital Logic Laboratory (0-3-1) Term 071

#### Course Learning Outcomes

1. The ability to design combinational and sequential circuits to meet certain specifications.
2. The ability to use tools and discrete components, EEPROMs, FPGAs, to model, simulate and implement digital circuits.
3. The ability to design and conduct experiments related to digital systems and to analyze their outcomes.
4. The ability to work in teams.
5. The ability to communicate effectively.

Section#	Source of Outcome Data	Outcome1	Outcome2	Outcome3	Outcome4	Outcome5
52 & 54	Instructor Evaluation	89%	74%	77%	77%	75%
	Student Survey	76%	70%	74%	90%	84%
53	Instructor Evaluation	77%	88%	85%	85%	85%
	Student Survey	85%	91%	78%	88%	81%
Overall	Assessment Rating	Achieved	Achieved	Achieved	Achieved	Achieved

#### Observations:

1. Based on both direct and indirect assessments, all outcomes are considered achieved.

## Course Assessment Summary

### COE 205 Computer Organization & Assembly Language (3-3-4)

### Term 071

#### Course Learning Outcomes

1. Ability to analyze, design, implement, and test assembly language programs.
2. Ability to use tools and skills in analyzing and debugging assembly language programs.
3. Ability to design the datapath and control unit of a simple CPU.
4. Ability to demonstrate self-learning capability.
5. Ability to work in a team.

Section#	Source of Outcome Data	Outcome1	Outcome2	Outcome3	Outcome4	Outcome5
2	Instructor Evaluation	72.4%	70%	65.5%	78%	72.5%
	Student Survey	83%	63.5%	63.5%	72.3%	79%
Overall	Assessment Rating	Achieved	Needs Improvement	Needs Improvement	Achieved	Achieved

#### Observations:

1. Based on the assessment of course learning outcomes, while all outcomes are considered achieved with a satisfactory level, outcomes 2 and 3 need improvement. It should be noted that while outcome 2 has been directly assessed with a weight of 2 (less than the minimum weight), it is also indirectly covered in assignments, lab project and lab work. Thus, it satisfied the minimum weight coverage indirectly.
2. Based on both instructor direct assessment and indirect assessment through student survey, it is clear that all the course outcomes are considered achieved with a satisfactory level while Outcomes 2 and 3 need improvement.
3. This group of students was less capable than the previous semester's group which is clearly reflected on the outcomes assessment.

#### Recommendations:

1. Outcome 2 is primarily covered in the lab and more emphasis should be given on this outcome primarily focusing on effective use of debugging tools.
2. Outcome 3 needs to be allocated more lectures to give students more time to digest the covered concepts as this topic is covered as the last part in the course.

**Course Assessment Summary**  
**COE 308 Computer Architecture (3-0-3)**  
**Term 071**

**Course Learning Outcomes**

1. Ability to apply knowledge of mathematics, probability, and statistics in computer analysis and design.
2. Ability to design the datapath and control of a processor.
3. Ability to identify, formulate, and solve computer architecture problems.
4. Ability to use simulator tools.
5. Ability to engage in self-learning.

Section#	Source of Outcome Data	Outcome1	Outcome2	Outcome3	Outcome4	Outcome5
2	Instructor Evaluation	70%	74%	75%	74.5%	78%
	Student Survey	83%	96%	88%	54%	83%
Overall	Assessment Rating	Achieved	Achieved	Achieved	Needs Improvement	Achieved

**Observations:**

1. In the previous semester, the instructor has suggested to increase the portion of the material to be self-learned. In this semester, he has assigned all the multicycle processor design as self-learning material.
2. The design in this course is not limited to the datapath unit and the control unit of a processor but covers also the design of instruction sets, cache memory systems and virtual memory systems. So the design component was applied to all these parts.
3. The results from the student learning outcome survey show higher figures than what is obtained from the course evaluation table. This is a normal phenomenon because students tend to think that they learnt the material better than what is actually achieved in the grades. That's why the student survey should be used to confirm the course evaluation. For example, outcomes 1, 2, 3 and 5 are properly achieved. However, outcome 4 does not seem to have been actually assimilated by the students.

**Recommendations:**

4. Outcome 4 is about the use of simulator tools. This outcome is particularly important because it is one of the industry requirements. The instructor actually sensed difficulties that many students had with using the simulator tool (Modelsim). He has deliberately chosen this tool because it is an industrial tool and he has also chosen the verilog language and RTL description as requirements for the project. He suggests putting a particular emphasis on the design flow with their respective tools to strengthen the abilities of the students in using these tools. This emphasis should be put earlier in the curriculum and injected properly.

**Course Assessment Summary**  
**COE 390 Seminar (1-0-1)**  
**Term 071**

**Course Learning Outcomes**

1. Knowledge of contemporary issues.
2. Ability to make effective presentation.
3. Knowledge of professional and ethical responsibility.
4. Understanding the impact of engineering solutions in a global and societal context.
5. Ability to engage in life-long learning.

Section#	Source of Outcome Data	Outcome1	Outcome2	Outcome3	Outcome4	Outcome5
2	Instructor Evaluation	73%	78%	91%	96%	93%
	Student Survey	88%	84%	94%	94%	81%
Overall	Assessment Rating	Achieved	Achieved	Achieved	Achieved	Achieved

**Observations:**

1. It is difficult to measure the knowledge of contemporary issues in Computer Engineering disciplines in a context where students are going to managerial positions and in an environment where no significantly related industry exists. The impact of contemporary issues is best assessed in product development and product selection. This course is only injecting these.
2. The outcome 4, “Understanding the impact of engineering solutions in a global and societal context” cannot be properly assessed as students are not in the context of proposing engineering solutions in this course. This outcome should not be an expected outcome for this course. The attendance of the presentation gives a small insight about the issues related to this point without being able to assess that.
3. The instructor observed that he does not have the capability to assess (through quizzes) the knowledge of contemporary issues like the Saudi economy or the impact of the global warming phenomenon.
4. The instructor believes that paper selection should be graded. The grade should include originality, relevance to Computer Engineering, and whether it is a contemporary hot topic.
5. The class for this semester included a majority of exceptionally skilled students and therefore, the outcome assessment table reflects perfectly their performance.