

**ATTACHMENT 2 (e)**

**Course Specifications**

**Kingdom of Saudi Arabia**

**The National Commission for Academic Accreditation & Assessment**

**Course Specifications  
(CS)**

## Course Specifications

Institution: <b>Najran University</b>	Date of Report:
College/Department: <b>College of Engineering/Electrical Engineering Department</b>	

### A. Course Identification and General Information

1. Course title and code: <b>Logic Design Laboratory 332EE1</b>		
2. Credit hours: <b>1(0,2,0)</b>		
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) <b>Bachelor of Electrical Engineering</b>		
4. Name of faculty member responsible for the course: <b>Eng. Omar AlShorman</b>		
5. Level/year at which this course is offered: <b>7<sup>th</sup> Level/ 3<sup>rd</sup> Year</b>		
6. Pre-requisites for this course (if any): <b>None</b>		
7. Co-requisites for this course (if any): <b>None</b>		
8. Location if not on main campus:		
9. Mode of Instruction (mark all that apply)		
a. Traditional classroom	<input checked="" type="checkbox"/> What percentage?	<input type="text" value="100%"/>
b. Blended (traditional and online)	<input type="checkbox"/> What percentage?	<input type="text"/>
c. e-learning	<input type="checkbox"/> What percentage?	<input type="text"/>
d. Correspondence	<input type="checkbox"/> What percentage?	<input type="text"/>
f. Other	<input type="checkbox"/> What percentage?	<input type="text"/>
Comments:		

## B Objectives

<p>1. What is the main purpose for this course?</p> <p><b>By the completion of this course, the student should be able to:</b></p> <p><b>1. It familiarizes the student with logic gates and medium scale integration (MSI).</b></p> <p><b>2. Within this lab, the student tests the validity of logic concepts.</b></p> <p><b>3. Furthermore, he can analyze, design, build and test basic combinational and sequential logic circuits.</b></p>
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)</p> <ul style="list-style-type: none"> <li>- <b>Increase use of simulation.</b></li> <li>- <b>Increase use of internet resources.</b></li> </ul>

## C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Introduction to ETS-8000A (General Digitized Training System) Experiment 1: OR Gate; NOT Gate; NOT-OR Gate.	Week 1, 2	4 Hours
Experiment 2: Basic Logic Gates (2-Input NAND Gate; 4-Input NAND Gate; AND-NOR Gate and Staircase Light Control).	3, 4	4 Hours
Experiment 3: Combinational Logic Circuits ( $X+0=X$ and $X+1=1$ ; verifying $X*0=0$ and $X*1=X$ ; $X+X=X$ , $X+X'=1$ ; $X*X=X$ , $X*X'=0$ ; $(X*Y)'=X'+Y'$ ; $(X+Y)'=X'*Y'$ ;2-Bit Magnitude Comparator; Voting Machine and Display Patterns).	5, 6	4 Hours
Experiment 4: Adder and Subtractor (Half Adder; Full Adder; Half Subtractor; Full Subtractor; 4-Bit Adder; 4-Bit Subtractor; BCD Adder).	7, 8	4 Hours
Experiment 5: Decoder, Encoder, 7-seg Display (8-to-3 Encoder ; 3-to-8 Decoder).	9, 10	4 Hours
Experiment 6: Multiplexer and Demultiplexer (Logic Unit; Implementing Logic Function with Multiplexer).	11, 12	4 Hours
Experiment 7: Basic Flip-Flops (NAND Gate RS Flip-Flop; NOR Gate RS Flip-Flop; JK Flip-Flop; T Flip-Flop; D Flip-Flop).	13, 14	4 Hours

Experiment 8: Flip-Flops Applications (Converting JK to D Flip-Flop; Converting JK to T Flip-Flop).	15	2 Hours
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2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	-	-	30	-	Office Hours (30 Hours/semester)	60 Hours
Credit	-	-	1	-	-	1 Hour

3. Additional private study/learning hours expected for students per week: 0 Hours
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy
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Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The *National Qualification Framework* provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

On the table below are the five NQF Learning Domains, numbered in the left column.

**First**, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	Define the logic circuits laboratory and logic gates.	1- Lectures. 2- Experiments.	1- Reports 2- Exams.
1.2			
<b>2.0</b>	<b>Cognitive Skills</b>		
2.1	Analyze Basic Boolean function using logic gates.	1- Lectures. 2- Experiments.	1- Reports 2- Exams.
2.2	Analyze and design combinational logic circuit.	1- Lectures. 2- Experiments.	1- Reports 2- Exams.
2.3	Design sequential circuits.	1- Lectures. 2- Experiments.	1- Reports 2- Exams.
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	NA		
3.2			
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	NA		
4.2			
<b>5.0</b>	<b>Psychomotor</b>		
5.1	NA		
5.2			

**Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching**

NQF Learning Domains	Suggested Verbs
<b>Knowledge</b>	list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write
<b>Cognitive Skills</b>	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict,

	justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise
<b>Interpersonal Skills &amp; Responsibility</b>	demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write
<b>Communication, Information Technology, Numerical</b>	demonstrate, calculate, illustrate, interpret, research, question, operate, appraise, evaluate, assess, and criticize
<b>Psychomotor</b>	demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble, experiment, and reconstruct

Suggested **verbs not to use** when writing measurable and assessable learning outcomes are as follows:

Consider	Maximize	Continue	Review	Ensure	Enlarge	Understand
Maintain	Reflect	Examine	Strengthen	Explore	Encourage	Deepen

Some of these verbs can be used if tied to specific actions or quantification.

**Suggested assessment methods and teaching strategies are:**

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.

#### 5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Reports	During the semester	28%
2	Midterm Exam	Week 12	22%
3	Final Exam	At the end of the semester	50%

#### D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)
- 2 Office hours/week.

#### E. Learning Resources

1. List Required Textbooks  
Morris , "Digital Design", Prentice Hall, 1998.
2. List Essential References Materials (Journals, Reports, etc.)  
M. Morris Mano, Michael D. Ciletti, Digital Design, 4th edition, Prentice-Hall, 2007.  
- John F. Wakerly, Digital Design: Principles and Practices Package, 4th edition, Prentice-Hall, 2007.  
- Nilsson, "Electric Circuits", Addison Wesley, 1996.  
-<http://lib.nu.edu.sa/digitalLibrary.aspx>
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)  
IEEE spectrum [http://spectrum .ieee.org/](http://spectrum.ieee.org/).
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)  
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5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.  
Circuit Maker tools.

#### F. Facilities Required

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| Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)             |
| 1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)<br>Laboratory room for 25 students.  |
| 2. Computing resources (AV, data show, Smart Board, software, etc.)<br>Data Show<br>Board  |
| 3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)<br>ETS-8000A (General Digitized Training System) and it's modules. |

#### G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> <li>- Open discussion for the students to touch their weak and strong points in the subject.</li> <li>- Feedback from exams and reports records.</li> <li>- Complete course evaluation questionnaire by the students.</li> </ul>
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
Seminars for the teacher, to show his lectures arrangement and progress in front of all the staff members in the department.
3 Processes for Improvement of Teaching
Use videos tutorials to demonstrate the concepts of various course topics.
4 Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)
Re-check the final term exams for some random students by another faculty member in the same field subject inside the department.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
Improve course contents by an external committee member in the same field of study in another institution.

**Faculty or Teaching Staff: Omar AlShorman**

**Signature:** \_\_\_\_\_

**Date Report Completed: 11 -4-1436**

**Received by:** \_\_\_\_\_

**Dean/Department Head**

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_