



# **COURSE REPORT (CR)**

**Najran University**  
**College of Computer Science and Information Systems**  
**Department of Computer Science**

**Course Name: Theory of Computation**  
**Course Code: 235CSS-3**

**June 2017**

<b>Institution:</b> Najran University	<b>Date of Course Report:</b> June , 2017
<b>College/ Department:</b> College of Computer Science and Information Systems/ Department of Computer Science	

### A. Course Identification and General Information

1. Course title: Theory of Computation	Code # 235CSS-3	Section # 207	Female			
2. Name of course instructor: Eman Abdulkreem		Location: university Campus/ Najran				
3. Year and semester to which this report applies. 1437-1438 (2016/2017) Second Semester						
4. Number of students starting the course?	10	Students completing the course?	8			
5. Course components (actual total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	6	-	-	-	51
Credit	3	0	-	-	-	3

### B. - Course Delivery

1 Coverage of Planned Program			
Topics	Planned Contact Hours	Actual Contact Hours	Reason for Variations if there is a difference of more than 25% of the hours planned
Why Study Automata Theory, Introduction to Finite Automata, Structural Representation, The Central concepts of Automata theory, Alphabets, Strings, Languages	3	3	----
Deterministic Finite Automata, Definition of a Deterministic Finite Automata, How a DFA processes Strings, Simpler Notations for DFA's, Extending the Transition function to Strings, The Language of a DFA, Non-deterministic Finite Automata, An informal view of Nondeterministic	9	9	----

Finite Automata, Definition of a Nondeterministic Finite Automaton, Equivalence of Deterministic and Non-deterministic Finite Automata.			
Regular Expressions, The operators of Regular Expressions, Building Regular Expressions, Precedence of Regular Expressions, Finite Automata and Regular Expressions, From DFAs to Regular Expressions, Converting Regular Expressions to Automata	6	6	----
Proving Languages not to be Regular, The pumping lemma for Regular languages, Equivalence and Minimization of Automata, Minimization of DFA's	3	3	----
Context-Free Grammars, Definition of Context-Free Grammars, Derivation using a Grammar, Leftmost and Rightmost Derivations, Parse Trees, Constructing Parse Trees, The Yield of a Parse Tree	6	6	----
Definition of Pushdown Automaton, The Formal Definition of Pushdown Automata, Graphical Notation for PDA's, Equivalence of PDA's and CFG's	6	6	----
Normal Forms for CFGs, Eliminating Useless Symbols, Eliminating production, Eliminating Unit Production, Chomsky normal form	3	3	----
The Turing Machine, Notation for the TM, Transition Diagrams for TM, Extension to the Basic TMs, Equivalence of One Tape and Multi-tape TMs	3	3	----
The Halting problems, The Classes P and NP, Polynomial Time Reductions, NP-Complete problems	3	3	----

## 2. Consequences of Non Coverage of Topics

For any topics where the topic was not taught or practically delivered, comment on how significant you believe the lack of coverage is for the course learning outcomes or for later courses in the program. Suggest possible compensating action.

Topics (if any) not Fully Covered	Effectuated Learning Outcomes	Possible Compensating Action
N/A	N/A	N/A
N/A	N/A	N/A

### 3. Course learning outcome assessment.

	List course learning outcomes	List methods of assessment	Percentage of Achievements (a student achieves a CLO if he achieves 65% of it)	Summary analysis of assessment results
1	<b>CLO_1</b> : Describe the basic concepts of alphabets, strings, regular expressions, languages, derivation (leftmost and rightmost), finite state machines, pushdown automata, Turing machines, decidability, halting problems and time complexity.	Quiz1, Mid-Term 1, Mid-Term2, Final Exam	<b>75%</b>	Students didn't attend for lectures regularly
2	<b>CLO_2</b> Explain the relationships between regular expressions, different types of languages defined by grammars and abstract machines.	Mid-Term 1, Lab Test, Final Exam	<b>100%</b>	
3	<b>CLO_3</b> Construct finite automata, push down automata, Turing machines and regular expressions that models different types of languages	Assignment1, Final Exam	<b>62.5%</b>	
4	<b>CLO_4</b> : Design various models of computation.	Midterm 2, Final Lab Exam, Final Exam	<b>37.5%</b>	
5	<b>CLO_5</b> : Assess the equivalence of DFA with NFA, PDA with context free grammars, and regular expressions with automata.	Midterm 2, Final Exam	<b>50%</b>	

Summarize any actions you recommend for improving teaching strategies as a result of evaluations in table 3 above.

- Increase the number of critical thinking problems.
- Devote more time to solve more problems.
- Encourage Active learning process by letting students share their ideas in the classroom.
- Explain importance of class attendance

4. Effectiveness of Planned Teaching Strategies for Intended Learning Outcomes set out in the Course Specification. (Refer to planned teaching strategies in Course Specification and description of Domains of Learning Outcomes in the National Qualifications Framework)

List Teaching Methods set out in Course Specification	Were these Effective?		Difficulties Experienced (if any) in Using the Strategy and Suggested Action to Deal with Those Difficulties.
	No	Yes	
TS-1: Relate Course Learning Outcomes (CLOs) to the topics		Yes	
TS-2: Lectures, active learning, collaborative and cooperative learning and independent study assignments.		Yes	
TS-3: Assigning computation related tasks that can be answered by reading the provided material and to analyze it.		Yes	
TS-4: Group discussion in the class.		Yes	
TS-5: Presenting, analyzing and solving different problems in class room		Yes	
TS-6: Encourage students to browse different journals, seminars or websites at their leisure time to have better understanding	NO		The most important difficulties faced that students are weak in English and they don't have the motivation to even read the handouts of the course.

TS-7: Let students present the answers of carefully chosen problems.		Yes	
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**Note:** In order to analyze the assessment of student achievement for each course learning outcome, student performance results can be measured and assessed using a KPI, a rubric, or some grading system that aligns student work, exam scores, or other demonstration of successful learning.

### C. Results

1. Distribution of Grades			
Letter Grade	Number of Students	Student Percentage	Explanation of Distribution of Grades
A	0	0%	
B	1	10%	
C	3	30%	
D	3	30%	
F	1	10%	
Denied Entry	0	0%	
In Progress	0	0%	
Incomplete	0	0%	
Pass	7	70%	
Fail	1	10%	
Withdrawn	2	20%	
2. Analyze special factors (if any) affecting the results The most important factors that affect the results are: Lack of student attendance			

3. Variations from planned student assessment processes (if any) (see Course Specifications).	
a. Variations (if any) from planned assessment schedule (see Course Specification)	
Variation	Reason
	.
b. Variations (if any) from planned assessment processes in Domains of Learning (see Course Specification)	
Variation	Reason
N/A	N/A

4. Student Grade Achievement Verification (eg. cross-check of grade validity by independent evaluator).	
Method(s) of Verification	Conclusion
Course coordinator checks all exams and make sure that they are related to CLOs and appropriate for the course.	The coordinator of the course checked all exams and other related materials related to the course. The course coordinator gave some comments and suggested to reduce the complexity levels of some exams.
By the end of the semester, the curriculum committee review all courses and approve actions to be taken in the subsequent semester.	The curriculum committee will review the final report of the course and will approve a list of actions to improve the quality of the course.
The vice dean and the dean of the college have to review and approve the final grades.	The dean and vice dean discussed the grades with me. They were surprised with the low percentage of passing. Based on my justification, they approved the students' grades.
A list of staff members have to check the grades of each one of the students in all exams.	The college assigned one faculty member to recheck the validity of the students' grades. More specifically, he checked the grades of students in all exams. Minor changes were happened based on his rechecking.

#### D. Resources and Facilities

1. Difficulties in access to resources or facilities (if any)  Each student must have a hard copy text book.	2. Consequences of any difficulties experienced for student learning in the course.  Students are only studying the lecture handouts that are not enough for full understanding.
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## E. Administrative Issues

1 Organizational or administrative difficulties encountered (if any)  N/A	2. Consequences of any difficulties experienced for student learning in the course.  N/A
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## F Course Evaluation

1 Student evaluation of the course (Attach survey results report)
<p><b>a. List the most important recommendations for improvement and strengths</b> According to the students' opinion in the online course survey, the following recommendations are found:</p> <ol style="list-style-type: none"> <li>1. Before the beginning of the course: basic guidelines, success requirements, learning outcomes and required recourse for the course were not clear.</li> <li>2. At the end of the course: the team work and communication skills were not addressed in this course.</li> </ol>
<p><b>b. Response of instructor or course team to this evaluation</b></p> <ol style="list-style-type: none"> <li>1. A two pages course syllabus was distributed to students in the first week. Course syllabus contains the learning outcomes, weekly topics, assessment methods, etc.</li> <li>2. All assessment methods were reviewed and approved by the course coordinators.</li> <li>3. Teaching strategies were based on outcomes-based educational system. For example, active learning was use, etc.,</li> <li>4. The main reason of their responses is the grade. They were trying to get grades without studying and achieving the minimum requirement of learning outcomes.</li> </ol>
<p><b>2. Other Evaluation (e.g. by head of department, peer observations, accreditation review, other stakeholders)</b></p> <p>The evaluation of course learning outcomes using students' performances.</p>
<p><b>a. List the most important recommendations for improvement and strengths</b> Refer to section B. CLOs achievements using students' performance.</p>
<p><b>b. Response of instructor or course team to this evaluation</b></p> <p>Refer to section B. CLOs achievements using students' performance.</p>



## G. Planning for Improvement

1. Progress on actions proposed for improving the course in previous course reports (if any).			
Actions recommended from the most recent course report(s)	Actions Taken	Results	Analysis
Relate CLOs with topics, teaching strategies and exams	Yes	Students were aware about the course learning outcomes (CLOs) as well as the types of exams and teaching strategies by	
Devote more time to solve, analyze, and evaluate problems by students in a class room	Yes	Students were able to find the possibility of solving huge number of problems.	
One hour tutorial is required.	Yes	This action was taken and students learn how to solve problems.	

2. List what actions have been taken to improve the course (based on previous CR, surveys, independent opinion, or course evaluation). Actions Taken:
<ol style="list-style-type: none"> <li>1. Force students to attend classes every week.</li> <li>2. Always review the principles, usage and benefits Automata Theory</li> <li>3. Convince students to attend at least one hour tutorial every week.</li> <li>4. Devote more time to solve, analyze, and evaluate problems by students in a class room.</li> </ol>

3. Action Plan for Improvement for Next Semester/Year				
Actions Recommended	Intended Action Points and Process	Start Date	Completion Date	Person Responsible
CLOs must be explained to students at least once in every two weeks.	Explanation of CLOs	Jan. 2014	June 2014	Instructor
Students should know the expectations in the assessment methods. So I recommend giving the marking scheme (e.g. Rubric, etc.) to students before assessment methods.	Marking scheme	Jan 2014	June 2014	Instructor

Encourage students to come to the office hours	Motivating students	Jan 2014	June 2014	Instructor
Make sure that students know the relationships between CLOs, topics, teaching strategies and assessment methods.	CLOs mapping to teaching strategies and assessment methods	Jan 2014	June 2014	Instructor

**Name of Course Instructor:** Ms. Eman Abdulkreem

**Signature:** *Eman Abdulkreem*

**Date Report Completed:** Jun 2, 2017

**Program Coordinator:** Dr. Abdulrahman Thaqfan

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



**Date Received:** Jun 2, 2017