

**King Fahd University of Petroleum and Minerals**  
**College of Computer Sciences and Engineering**  
**Department of Computer Engineering**

**ICS 555 – Data Security & Encryption (T162)**

**Term Project**

**Wednesday, February 15<sup>th</sup>, 2017**

## **1 Introduction**

Students will work throughout the semester, in teams of three, on a project in the area of ***Internet of Things (IoT) security***. They will be expected to choose an IoT security problem, survey the related work, propose a new/enhanced solution to the problem, and, if possible, provide a proof of concept testing of the proposed solution. The proof of concept testing will be considered as a **bonus of an extra 5% added to total grade of the course**. The students will have to deliver a term paper and a presentation of their work at the end of the semester.

## **2 Project Description**

The goal of this project is to propose a new/enhanced solution to an IoT security problem, and, if possible, provide a proof of concept testing of the proposed solution. Of special interest are IoT security problems that address IoT cyberattacks that may cause physical damage and even threaten human lives. You can use for the purpose of testing any simulation tool that you prefer.

The students will choose an IoT security problem to work on after reading the following references. The students may alternatively select another topic after consultation with the instructor.

<http://ieeexplore.ieee.org/abstract/document/6746513/>

<http://ieeexplore.ieee.org/abstract/document/6978614/>

<http://ieeexplore.ieee.org/abstract/document/7167238/>

<http://dl.acm.org/citation.cfm?id=2737091>

<http://www.sciencedirect.com/science/article/pii/S1084804514002136>

## **3 Project Expectations**

The outcome of the project must be a proposal of a new/enhanced solution to an IoT security problem at the end of the semester.

You need to follow these steps in your project:

- Survey of different existing solutions to the selected topic
- Propose a new/enhanced solution to the selected topic
- Implement the new/enhanced solution to the selected topic (*Bonus*)
- Term paper
- Presentation

## 4 Project Deliverables

The following are the deliverables expected from each team and the due date for each.

	<b>Deliverables</b>	<b>Due date</b>	<b>Grade's weight</b>
1	Proposal	Wednesday, March 01, 2017 (wk 04)	<b>15%</b>
2	Progress Report	Wednesday, April 12, 2017 (wk 09)	<b>25%</b>
3	Presentations	May 22 – 24, 2017 (wk 15)	<b>20%</b>
4	Term paper	Monday, May 22, 2017 (wk 15)	<b>40%</b>

### 4.1 Proposal

The proposal should include the following sections:

1. Introduction (including motivations and objectives)
2. Background and Terminology
3. Problem Statement (clearly identifying the selected problem topic along with what exactly is being targeted for by the proposed new/enhanced solution)
4. References (a list of recent journal/conference papers, not older than 3 years, that are related to the selected problem topic)

The proposal should not exceed **3 single-column pages** (excluding the cover page) with at least **12 point font** and at least **1.5 line spacing**.

### 4.2 Progress Report

The progress report should include the updated version of the proposal contents incorporating any feedback from the instructor, in addition to other sections as follows:

1. Introduction
2. Background and Terminology
3. Problem Statement
4. Related Work
5. Proposed Solution (must have detailed description of the proposed solution along with **qualitative** description of advantages/disadvantages over existing solutions)
6. Summary
7. References

It is very important to have a thorough understanding of the related research work. Study and cite all related papers. Do not simply copy the conclusions drawn in a paper; use your own assessment and intuition to verify the results and make your own judgment. An effective review of related research is not one that mentions everyone working in a particular area of research but it is one that classifies the area appropriately and discusses pros and cons of each class to justify one's own research.

The progress report should not exceed **12 single-column pages** (excluding the cover page) with at least **12 point font** and at least **1.5 line spacing**.

A meeting with the instructor will be scheduled afterwards to discuss your progress.

### 4.3 Class Presentation

The project presentations will be scheduled during the last week of classes. Each presentation will be **15 minutes long** followed by a question and answer session. Each team needs to do the following:

1. Prepare slides covering an introduction, description of the selected problem topic, **summary** of related work, description of the proposed solution, implementation and proof of concept testing results (if any), and discussion of the results (if any).
2. Send the slides to the instructor ([marwan@kfupm.edu.sa](mailto:marwan@kfupm.edu.sa)) at least one day before the talk.

### 4.4 Term Paper

You are expected to submit the term paper and the commented proof of concept testing code (if any) by the deadline. You can either have everything in a CD or send it to the instructor by email as a .zip file (if the file size is not very big). A hard copy of the term paper has also to be submitted to the instructor by the same deadline.

The term paper should be written as a professional-quality technical paper. Thus, the paper should be self-contained. It should start with an abstract and include a list of references. Look at any IEEE transactions paper to understand the format of references and other material. **The paper should not exceed 20 single-column pages with at least 12 point font and at least 1.5 line spacing.** You can choose your favorite word processor to produce this paper. **The paper should have a similarity report of no more than 15% (after excluding the bibliography) as reported by [www.ithenticate.com](http://www.ithenticate.com).**

The term paper should include the updated version of the progress report contents incorporating any feedback from the instructor, in addition to other sections as follows:

1. Abstract
2. Introduction
3. Background and Terminology
4. Problem Statement
5. Related Work
6. Proposed Solution (must have detailed description of the proposed solution along with **qualitative** description of advantages/disadvantages over existing solutions)
7. Proof of Concept Testing Setup (*Bonus*)
8. Evaluation and Analysis of Results (*Bonus*)
9. Future Directions
10. Conclusions
11. References

The term paper will be graded as follows:

Clearly stated background and rationale of work .....	<b>10%</b>
Breadth and depth of the critical review of related research .....	<b>30%</b>
Technical content (proposed solution design, implementation, analysis of results, etc.)...	<b>50%</b>
Paper organization (including limiting the number of pages to 20) .....	<b>10%</b>

## 5 Late submission policy

All deliverables submitted after the due date will have a grade of 0.