



Fayoum University  
Faculty of Computers & Information  
Second Term 2019/2020

Course Name: Operating System

Course Code: CS 355

Course Level: 3

Course Dr. Name: Shereen A. Hussien

Status: Pass  Not Pass:

**Before you begin working on your course research point, you must submit a formal report. The report is meant to help you crystallize the details of your research point and focus your energies on producing a high quality final paper. Researches should be 7 to 10 pages. The research will be performed individual and will be submitted as PDF file. The document must look professional and its first page as in the attached Research\_cover page file. The research should have the following sections:**

- **Abstract.** The abstract should summarize the entire research in one paragraph. State a problem, the general solution technique, the expected complications, the solution to those complications, and the nature of the evaluation that you will conduct. (It's usually easiest to write the abstract after you have finished everything else.)
- **Introduction.** Give a short introduction to the topic in your own words. Give a short example of why this topic is difficult or interesting. Briefly state the problem that you wish to solve.
- **Context.** Once you have laid out the background, describe exactly what you intend to accomplish. Clearly state the detailed information that addresses the problem stated in the introduction. Discuss the related papers that are most relevant to what you are doing.
- **Conclusion.** Is the last part of your research. You always end by summing up your arguments and drawing a *conclusion* about what you've been done in your research.
- **References.** Are the lists of resources that are used to help you in completing your research.

Research Content	Font: Times New Roman, Font Size: 12
Research Title	Font: Times New Roman, Font Size: 14, Bold
Paper Size	A 4

## **Choose one of the following topics for your research:-**

### **Topic 1: Wireless Networks**

Students interested in wireless networks (Wi-Fi, Bluetooth, Zigbee, etc.) can study protocol performance issues or protocol enhancements, e.g., to improve performance, reliability, or security or to enhance or explore network services. For example, building Wi-Fi ad-hoc networks on Linux systems has always been challenging and a project could modify one or more Linux network modules to facilitate setup and maintenance of ad-hoc networks.

### **Topic 2: File Systems**

In the area of file systems could study various performance bottlenecks and propose and develop new or modified file systems that may be provide improved performance for specific application scenarios. For example, with an increased interest in IoT and sensor networks, continuously arriving sensor data must be stored reliably and efficiently in files and databases on a computer system. A project could compare the database performance for various types of file systems, caching strategies, etc.

### **Topic 3: Mobile Operating Systems**

With the rapid increase in mobile computing systems, mobile operating systems have also been receiving increased attention. A research could study the Android OS and propose one or more enhancements to Android that either address certain shortcomings or bottlenecks or provides new services. For example, energy efficiency is a key concern in mobile systems and new Android services could intelligently manage the device's resources to reduce energy costs (e.g., consolidating the sensor requests from multiple competing apps).

### **Topic 4: Real-Time Systems**

Real-time systems require that operations are not only correct, but also timely. A research could evaluate existing real-time scheduling techniques for various types of applications (sensor streams, multimedia, web servers, etc.) and propose/develop/evaluate a new scheduling strategy that combines advantages of existing techniques.

### **Topic 5: Peer-to-Peer**

P2P communication is popular whenever a centralized solution could easily be overwhelmed. In this research, P2P protocols could be developed and evaluated, e.g., imagine the need to distribute a bug fix to thousands of computers quickly, efficiently, and reliably. How can we build a P2P file distribution system that can satisfy these conflicting requirements?

### **Topic 6: Security and protection**

A research could study various security challenges and concerns and propose new security features, especially addressing the needs of mobile or embedded systems. For example, imagine a web browser on a mobile device that adapts its security features depending on the type of network you are connected to or a browser that notifies the user of potential security concerns (e.g., whenever a website requests confidential information, connects to unknown (foreign) server addresses, etc.).

### **Topic 7: Virtual Machines**

Study various aspects of VM performance or setup/configure an online VM farm that is customized to specific application requirements or security features.

### **Topic 8: Cloud Services**

Focus on a back-end cloud service for mobile or embedded devices that provides features and services such as automatic updates and notifications, processing of user/sensor data, sharing of data and resources between multiple users, or the ability to split processing tasks between mobile device and server.

### **Topic 9: Quality-of-Service and Performance**

Quality-of-Service or QoS is a term that describes various performance metrics in a system or network. A research could compare various systems performance metrics and evaluate system enhancements for QoS. For example, a web/multimedia server may need to prioritize service requests based on the type of request, explicit timeliness demands (deadlines), priority classes, etc. Researches that address QoS and performance can cover all aspects of systems (file systems, storage, CPU, etc.).

## **Topic 10: Embedded/RT Operating Systems**

Embedded (and real-time) operating systems differ significantly from general-purpose systems such as Windows or Linux, e.g., many features are intentionally kept simple to make execution delays predictable and manageable. Researches focusing on embedded systems could study various performance aspects of such systems or develop enhancements that will make these systems suitable for future IoT applications, e.g., by providing support for on-device fusion and aggregation of multiple sensor streams, using prediction algorithms to decide if and which data to cache, or to coordinate processing among multiple devices.

- يختار الطالب احد الموضوعات عاليه لاجراء مقالة بحثية
- يكتب البحث الكترونياً ويرسل كملف واحد بصيغة PDF على البريد الالكتروني لاستاذ المقرر عاليه على ان يسمى الملف وكذلك موضوع البريد الالكتروني باسم الطالب ثلاثي والمقرر.
- سيتم رفض البحوث المتشابهة جزئيا او كليا ويعتبر الطلاب المتقدمون بها راسبين في هذه المادة
- الموضوعات المطروحة هي لما تم تدريسه سواء عن بعد او قبل تعليق الدراسة.
- يتم تسليم الأبحاث في الفترة من الاحد 2020/5/31 حتي الأثنين 2020/6/8.