**Georgia Southern University**

**Allen E. Paulson College of Engineering and Computing**

**Information Technology Department**

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**Course: IT2530-Operating Systems**

**Module 0-** Course Orientation and Introduction– reading material

Contents and Reading Material

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# Course Orientation and Introduction

Operating systems are the main gears in all computing devices. They are low-level software programs that can manage computer hardware, software applications, and their resources, and provide standard, secured, and manageable services for computer programs. Operating systems are often taken for granted by the end-user.  In IT, we deploy them, fix them, maintain them, and understand what is going on in them to complete our jobs and integrate with others. The official description of the course:

Principles of managing memory, processors, processes and deadlocks, synchronization of computing tasks, files, devices, and systems. Principles of network organization and network operating systems. Analysis and evaluation of comparative operating systems.

## **Course Learning Outcomes.**

On completion of the course, students will be able to:

1. **Describe** the fundamental organization of computer systems and explain the functional units of a microprocessor, memory, storage, and I/O devices.
2. **Describe** the functions and structures of operating systems:  processes/threads, virtual memory, file systems, memory management, and kernels.
3. **Describe** CPU scheduling, process queuing, and synchronization and how to avoid or overcome deadlocks.
4. **Work** with parallelism and virtualization.
5. **Use** the command line to **practice** shell scripting and manage the operating system.
6. **Identify** data sources within the operating system to manage systems.
7. **Discuss** the ethical and legal issues related to working with operating systems.

## **Textbook.**

None is required. We teach the course without any textbooks by depending only on freely available Open Education Resources (OERs). The created OER are part of a research project funded by Affordable Leaning Georgia (ALG) grant #590 round 19, year 2021.

## Course introduction

What is Operating System? A program that acts as an intermediary between a user of a computer and the computer hardware. The [list of OSs or OS platforms](https://en.wikipedia.org/wiki/List_of_operating_systems) include more 800 main operating system provided by more than 100 companies as properietry product in addition to many others that non-properietry. The following are a some example OSs inin some common categories.

* + Desktop and Midrange machine OSs
    - **Unix** by Bell Labs
    - **DOS** by Microsoft
    - **macOS** by Apple
    - **HP-UX** by Heulett Pachard
    - **AS400** by IBM
    - **UBUNTU Linux** – free open source
  + Mobile OSs
    - **Andcroid** by Google
    - **iOS** by Apple
    - **Fire OS** by Amazon
    - **AmigaOS** by Motorola
    - **LiteOS** by Huawei
    - **Bada** by Samsung
  + Emedded OSs
    - **ISIS** by Intel
    - **tvOS** by apple
    - **Windows CE** from Microsoft
    - **Sailfish OS** – free open source
    - **NetBSD** – free open source
  + Web OSs
    - **Chrome OS** by Google
  + Network OSs
    - **Cisco IOS** by Cisco Systems
    - **Netware** by Novell
  + Routers OSs
    - **CatOS** by Cisco Systems
    - **JunOS** by Juniper Networks

## Main course Modules

* + Overview of Computer Architecture
  + Intro to computer systems and OSs
  + Process & Thread Management
  + CPU scheduling & Process Synchronization
  + Main and Virtual memory Management
  + I/O and Device/Disk scheduling
  + File system Management
  + Shell Scripting
  + Computing System Paradigms
  + Operating systems security
  + Access control and biometrics
  + Cyber Ethics

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