ITM 401 SYLLABUS (DRAFT)

ITM 401 Introduction to Advanced Studies I

Hours: 3 credit hours / 45 contact hours

Instructor: Vasilios "Billy" Pappademetriou

Textbook, title, author, and year:
> *uCertify IT Specialist Python* ISBN: 9781644593318, 2022 https://www.ucertify.com/p/python.html
> *uCertify CompTIA A+ (220-1001)* ISBN: 9781644590768, 2022 https://www.ucertify.com/p/comptia-a-220-1001.html
> *uCertify CompTIA A+ (220-1002)* ISBN: 9781644590775, 2022 https://www.ucertify.com/p/comptia-a-220-1002.html

Specific course information
    a. Catalog description: First course in a two-course sequence designed to prepare students for graduate study in information technology or cybersecurity. Explores the basics of computer architecture and use of contemporary operating systems and networking. Covers hardware requirements, components, software compatibility, and system installation topics as well as other key operating systems functions. Networking, virtualization, cloud computing, and security concepts are introduced. Also introduced are basic concepts of object-oriented application development using a modern programming language. Students learn to apply basic programming concepts toward solving problems, writing pseudocode, working with and effectively using basic data types, abstract data types, control structures, code modularization and arrays as well as the object paradigm including classes, inheritance, and polymorphism. Application development, hardware, network, and operating systems are taught in an integrated manner. This course does not apply toward undergraduate credit in the Department of Information Technology and Management, or to Master's, M.S., or Ph. D. credit in the College of Computing.
    b. Prerequisites: None

Specific goals for the course
    a. Program Educational Objectives
        1. Problem solve and create innovative answers to provide technology solutions for the problems of business, industry, government, non-profit organizations, and individuals.
    b. Course Outcomes:
        ITM 401 is a foundation course in the basics of PC functioning from a hardware level to the upper level operating system as well as functional knowledge of programming. The intent is to serve as a basis for practical studies in other topics in IT and cybersecurity. Upon completion, a student should be able to understand how a PC functions, be able to troubleshoot and repair a PC, and understand its workings in a networked environment from a hardware level to OS level. Students recall and employ concepts of operating systems including Windows, MacOS, Linux; networking; virtualization; servers; security concepts; and tools for managing IT. Students will be able to program in a contemporary open-source programming language, and understand and employ variables, data types, control statements, functions, lists, dictionaries, object-orientation, modules and files, and error handling.
    c. Course student outcomes:
        Upon completion of this course the student should be able to do the following
- Recall and describe the components of a computer
  - Explain the functioning of processors
  - Describe the purpose and operation of motherboards, buses, architecture, and memory
  - Explain the role and operation of storage, monitors, and other peripherals
- Assemble a computer from a set of components
  - Demonstrate methods for troubleshooting hardware
- Describe fundamental concepts of networking including physical media, devices, protocols, and standards
  - Explain and demonstrate installation and configuration of a small office/home office network
- Explain & demonstrate installation & basic configuration of an operating system (OS)
  - Administer operating systems at a basic level
  - Use operating system utilities
- Describe cloud computing concepts
- Describe and employ operating system virtualization
- Recall and describe software application and development theory and concepts
- Write, compile, execute, troubleshoot, analyze, evaluate, and resolve simple problems through program coding using Python
- Develop, synthesize, and identify important language standard libraries and utilities.
- Apply data transfer techniques between modules using parameters and return values.
- Construct applications to use simple files for input and output.
- Implement arrays as structures to contain data.
- Use a higher-level programming language to code, test, and debug software designs.
- Implement concepts of Object Oriented Programming (OOP), inheritance and polymorphism.

Each ITM Departmental Syllabus *represents a recent offering of the course. The instructor, textbook(s), course outcomes, and course student outcomes/learning objectives may vary in future semesters.*

April 22, 2022

Topics to be covered
  a. Introduction. IIT Banner, Class basics, intro to the Python IDE
  b. Introduction to Virtualization
  c. Operating System Basics
  d. Introducing Python
  e. Intro to Hardware
      i. Motherboards, Processors, and Memory
      ii. Internal Expansion, Storage Devices, and Power Supplies
      iii. Peripherals, Connectors, and Printers
  f. Programming: Data Types
  g. Custom System Configurations
  h. Programming: Functions
  i. Operating System Administration
      i. Working with Windows Versions
      ii. Working with macOS and Linux
  j. Programming Control Statements
  k. Networking Fundamentals and TCP/IP
      i. Installing Wireless and SOHO Networks
  l. Programming: Lists and Tuples
  m. Network Services, enterprise virtualization, and Cloud Computing
  n. Programming: Dictionaries and Sets
  o. Security Concepts
      i. Securing Operating Systems
  p. Scripting and Remote Access
  q. Object-Oriented Programming
  r. Working with Laptops and Mobile Devices
  s. Programming: Modules, Packages, and File Operations
  t. Troubleshooting Methodologies
      i. Hardware and Network Troubleshooting
      ii. Troubleshooting Operating Systems and Security
  u. Programming: Error Handling
  v. Documentation and Professionalism

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