






Diploma in System Design (401) – Operating System Management

Prerequisites: Basic knowledge of computing terminology.	Corequisites: A pass or better in Certificate in Computer Fundamentals or equivalence.
<p>Aim: In today's IT-centric business environments, the need for correctly specified, configured and managed computer systems is at the heart of business efficiency and security. Whether it is an in-house accounting and finance system in an SME or a corporate-wide data system in an international organisation, the role of systems administration is one that ensures integrity of the vital data upon which major business decisions are made. This course is about professional practice in IT at a senior level, where there is a growing need for practitioners who can take strategic IT plans and implement the associated computer and network infrastructures, as well as create appropriate administrative and maintenance structures that are responsive to company needs. The theory and concepts related to operating system design are presented from both developer and user perspectives. Core concepts covered include process management, memory management, file systems, I/O system management including device drivers, process synchronization and interprocess communication, processor scheduling, memory management, virtual memory, interrupt handling, device management, distributed systems, and multi-user concepts including protection and security. Process management discussions focus on threads, scheduling. Memory management topics include paging, segmentation and virtual memory.</p>	
Required Materials: Recommended learning resources.	Supplementary Materials: Lecture notes and tutor extra reading recommendations.
<p>Special Requirements: Candidates are recommended to read and practice the abstract concepts behind Operating Systems Management outside class time.</p>	
<p>Intended Learning Outcomes:</p> <ol style="list-style-type: none"> 1. Describe the functions of memory manager, processor manager device manager and file manager. 2. Explore memory management in older systems and describe how computer's memory storage and management was handled by the operating system 3. Explore memory management in new systems and describe how computer's memory storage and management was handled by the operating system 4. Outline how process manager performs job scheduling, process scheduling and interrupt management. 5. Explore how a lack of Process 	<p>Assessment Criteria:</p> <ol style="list-style-type: none"> 1.1 Identify operating system components 1.2 Outline types of operating system 1.3 Analyse the history of the operating system 1.4 Describe computer hardware 2.1 Distinguish single vs multiple users 2.2 Define multiprogramming 2.3 Analyse first-fit and best-fit algorithms 2.4 Describe memory de-allocation 2.5 Design a simple assembly program 3.1 Describe disadvantages of early memory management schemes 3.2 Describe paged memory allocation 3.3 Define demand paging 3.4 Explore segment memory allocation 3.5 Describe virtual memory 4.1 Outline processor terms 4.2 Distinguish job scheduling vs process scheduling 4.3 Analyse process scheduling algorithms 4.4 Define cache memory 4.5 Explore types of interrupts 5.1 Define deadlock

Synchronization causes deadlock or starvation	5.2 Outline cases of deadlocks
	5.3 Describe strategies for handling deadlocks
	5.4 Explore banker's algorithm
6. Describe single processor configuration, multiple process synchronisation and multiple process programming techniques.	6.1 Define parallel processing
	6.2 Outline multi-processing configuration
	6.3 Analyse process synchronisation mechanisms
	6.4 Explore producers and consumers algorithm
	6.5 Describe concurrent processing system
7. Describe magnetic tape, magnetic disk and optical disk storage device management at process and job levels.	7.1 Outline device driver characteristics
	7.2 Describe sequential access storage
	7.3 Describe random access storage
	7.4 Explore components of I/O subsystems
	7.5 Analyse communication between devices
	7.6 Outline I/O request management
	7.7 Describe I/O interrupt handling
	7.8 Describe RAID levels
8. Outline how users communicate with File Manager and how writes name and other descriptive information.	8.1 Describe functions and responsibilities of file management
	8.2 Explore file organisational format
	8.3 Analyse storage medium allocation methods
	8.4 Describe data compression techniques
	8.5 Describe file management system levels
9. Describe network topologies, network types, access control techniques and transport protocol standards.	9.1 Distinguish network and distributed operating systems
	9.2 Describe network topologies
	9.3 Outline routing strategies
	9.4 Contrast packet switching vs circuit switching
	9.5 Analyse conflict resolution techniques
	9.6 Distinguish OSI vs TCP/IP protocol standards
	9.7 Analyse network operating features
	9.8 Analyse network system performance measurement tools
10. Describe single user operating systems, network operating systems and distributed operating system.	10.1 Outline the history of Disk Operating System (DOS), how it works and the operational commands
	10.2 Describe components of an operating system and how evaluate and measure system performance
	10.3 Outline the history of Windows, how it works and the operational commands
	10.3 Outline the history of Unix, how it works and the operational commands

**Recommended Learning Resources:
Operating System Management**

Text Books	<ul style="list-style-type: none">• Modern Operating Systems by Andrew S. Tanenbaum ISBN-10: 0136006639• Operating Systems: Internals and Design Principles by William Stallings ISBN-10: 0273751506• Network Operating Systems and LAN Management by Huang Jian Bian ISBN-10: 7115132917
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	None

Tel: 0044 7423211037

Email: info@londoncomputercollege.co.uk Website: www.londoncomputercollege.co.uk

Registered No: 3267009 (England)