Subject Description Form

Subject Code	EIE3343
Subject Title	Computer Systems Principles
Credit Value	3
Level	3
Pre-requisite	EIE2105 Digital and Computer Systems
Co-requisite/ Exclusion	Nil
Objectives	This subject provides students with a broad treatment of the fundamentals of computer operating systems and the related system programming techniques.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the basic structure of a computer operating system. 2. Comprehend the basic concepts of file system and management, process control, scheduling and communication, as well as memory management. 3. Develop software programs to implement the abovementioned system functions. Category B: Attributes for all-roundedness 4. Understand the creative process when designing solutions to a problem.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** • Operating System Overview OS objectives and functions Modern operating systems Microsoft windows overview UNIX and LINUX • File System and Management File organization and access File directories File sharing Secondary storage management System programming for file, directory and I/O access • Process Description and Control Definition of process Process description Process control Process communication System programming for process control and communication • Threads and Scheduling Processes and threads Thread management and scheduling Thread synchronization System programming for thread management • Memory Management Memory management requirement Memory partitioning Paging

Segmentation
Dynamic Link Library (DLL)
System programming for memory management

- Processor Scheduling
  Types of processor scheduling
  Scheduling algorithms
  Multiprocessor scheduling
  Case study

Teaching/ Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures	1, 2, 3	Fundamental principles and key concepts of the subject are delivered to students.
Tutorials	1, 2, 3	Supplementary to lectures and are conducted with smaller class size; students will be able to clarify concepts and to have a deeper understanding of the lecture material; problems and application examples are given and discussed.
Laboratory sessions	1, 2, 3, 4	Students will make use of software tools to develop system programs in order to resolve different system problems.
Assignments	1, 2, 3	Through working assignment and end-of-chapter problems in text books, students will develop a firm understanding and comprehension of the knowledge taught.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/ Task	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)			
		1	2	3	4
1. Continuous Assessment	50%				
• Laboratory sessions	10%	✓	✓	✓	✓
• Tests	25%	✓	✓	✓	
• Assignment(s)	15%	✓	✓	✓	
2. Examination	50%	✓	✓	✓	
Total	100%				

<table>
<tr><td></td><td colspan="2">Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

<table>
<tr><th>Specific Assessment Methods/Tasks</th><th>Remark</th></tr>
<tr><td>Assignments, tests and examination</td><td>End-of-chapter type problems used to evaluate students' ability in applying concepts and skills learnt in the classroom;</td></tr>
<tr><td>Laboratory sessions</td><td>Each student is required to answer several questions related to each lab session in the lab sheet and hand in his/her answers. Students need to think critically and creatively in order to come with an alternate solution for an existing problem.</td></tr>
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<tr><td rowspan="6">Student Study Effort Required</td><td>Class contact (time-tabled):</td><td></td></tr>
<tr><td>• Lecture</td><td>24 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes</td><td>15 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination</td><td>36 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or report writing</td><td>30 Hours</td></tr>
<tr><td>Total student study effort:</td><td>105 Hours</td></tr>
<tr><td>Reading List and References</td><td colspan="2">Reference Books:

1. J. Hart, Windows System Programming, 4th ed., Addison-Wesley, 2010.
2. W. Stallings, Operating Systems: Internals and Design Principles, 7th ed., Prentice-Hall, 2011.
3. H.M. Deital, P.J. Deital, and D.R. Choffnes, Operating Systems, 3rd ed., Prentice-Hall, 2004.</td></tr>
<tr><td>Last Updated</td><td colspan="2">June 2023</td></tr>
<tr><td>Prepared by</td><td colspan="2">Dr Lawrence Cheung</td></tr>
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