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| **UNIT OUTLINE REPORT** | |
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| **EDITH COWAN UNIVERSITY** | |
| **FACULTY OF HEALTH, ENGINEERING AND SCIENCE** | |
| **SCHOOL OF COMPUTER AND SECURITY SCIENCE** | |
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| **UNIT TITLE :** | Data Structures |
| **UNIT CODE :** | CSP2348 |
| **CREDIT POINTS :** | 15 |
| **FULL YEAR UNIT :** | No |
| **PRE-REQUISITE :** | CSP1150 - Programming Principles |
| **MODE OF DELIVERY :** | On-campus |
|  | Online |
|  | This version of the unit will be offered from 1-Jul-2013 |
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| **DESCRIPTION** | |
| This unit focuses on data abstraction and the realisation of abstract data types as re-usable and generic modules using Java as the vehicular programming language. Basic algorithmic analysis is also introduced. | |
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| **LEARNING OUTCOMES** | |
| On completion of this unit, students should be able to:   1. describe the general principles of algorithm complexity and performance; 2. analyse complexity and performance of their associated algorisms; 3. describe the concept, application, and specification of an abstract data type and employ Java classes to encapsulate abstract data types; 4. apply abstract data types to programming practices; 5. outline the role of abstract data types in software reusability. | |
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| **UNIT CONTENT** | |
| 1. Algorithms: fundamental principles of algorithms; analysis of algorithms to determine their time and space efficiency; the notion of complexity of algorithms; recursive algorithms and their complexity. 2. Data structures (arrays, linked lists, binary trees, and hash tables): their general properties; their specific properties in Java; their algorithms in insertion, deletion, searching, merging, and sorting. 3. Fundamentals of abstract data types (ADTs): distinction between data types and abstract data types; design considerations of ADTs; ADTs and software reusability; ADTs in Java Collection. 4. Commonly used ADTs (Stacks, Queues, Lists, Sets, Maps): their concepts and applications; their design requirements; their implementation using alternative data structures; existing implementation in the Java classes. | |
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| **TEACHING AND LEARNING PROCESSES** | |
| Knowledge and skills will be developed by a combination of lecture-based material and practical workshop/tutorial sessions.  The programming language Java will be the vehicle to illustrate lecture material and to complete workshop tasks. | |
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| **GRADUATE ATTRIBUTES** | |
| The following graduate attributes will be developed in this unit   * Ability to communicate * Critical appraisal skills * Ability to generate ideas * Ability to work in teams | |
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| **ASSESSMENT** | |
| Grading Schema 1 | |
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| Students please note: The marks and grades received by students on assessments may be subject to further moderation. All marks and grades are to be considered provisional until endorsed by the relevant Board of Examiners. | |
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| |  |  |  |  | | --- | --- | --- | --- | | *Item* | *On-Campus Assessment* | *Value* |  | | Workshop | Workshop activities\* | 20% |  | | Assignment | Paired programming assignment | 20% |  | | Examination | End of semester examination | 60% |  | | |
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| |  |  |  |  | | --- | --- | --- | --- | | *Item* | *Online Assessment* | *Value* |  | | Workshop | Workshop activities\* | 20% |  | | Assignment | Paired programming assignment | 20% |  | | Examination | End of semester examination | 60% |  | | |
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| N.B. Students are required to obtain at least 50% of the available marks in the examination in order to be eligible to pass the unit.  \* This assessment item may include the cumulative assessment of workshop tasks. | |
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| **TEXTS** | |
| Goodrich M. T., & Tamassia R. (2010). *Data structures and algorithms in java* (5th ed.). New York : John Wiley and Sons. | |
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| **SIGNIFICANT REFERENCES** | |
| Dale, N., Joyce, D. T., & Weems, C. (2010). *Object-oriented data structures using java* (2nd ed.). Sundbury, MA : Jones & Bartlett Learning. | |
| Karumanchi, N. (2011). *Data structures and algorithms made easy: Data structure and algorithmic puzzles.* United States : Career Monk Publications. | |
| Koffman, E., & Wolfgang, P. (2010). *Data structures: Abstraction and design using java.* (2nd ed.). USA : John Wiley & Sons, Inc. | |
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| **Disability Standards for Education (Commonwealth 2005)** | |  |
| For the purposes of considering a request for Reasonable Adjustments under the Disability Standards for Education (Commonwealth 2005), inherent requirements for this subject are articulated in the Unit Description, Learning Outcomes, Graduate Attributes and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on the support for students with disabilities or medical conditions can be found at the Student Equity, Diversity and Disability Service website: | |  |
| <http://intranet.ecu.edu.au/student/support/student-equity> | |  |
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| |  | | --- | | **Academic Misconduct** | |  | | Edith Cowan University has firm rules governing academic misconduct and there are substantial penalties that can be applied to students who are found in breach of these rules. Academic misconduct includes, but is not limited to: | | * plagiarism; * unauthorised collaboration; * cheating in examinations; * theft of other students’ work. | |  | | Additionally, any material submitted for assessment purposes must be work that has not been submitted previously, by any person, for any other unit at ECU or elsewhere. | |  | | The ECU rules and policies governing all academic activities, including misconduct, can be accessed through the ECU website. | | |  |