**CSC138: STRUCTURED PROGRAMMING**

| Course Name (English) | STRUCTURED PROGRAMMING APPROVED |
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| **Course Code** | CSC138 |

| MQF Credit | 3 |
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| Course Description | This course introduces the students to the techniques of programming using an imperative structured language. It covers single and multi-dimensional arrays, records and file processing concepts. Besides covering the basic syntax and semantics, the course emphasizes on problem solving methodology and modular programming techniques. |
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| Transferable Skills | Demonstrate analytical and skills using programming language. |
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| Teaching Methodologies | Lectures, Tutorial |
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| CLO | | |
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| | CLO1 | Apply the seven basic algorithms (minimum, maximum, counter, total, average, sorting and searching) |
| | CLO2 | Apply the concept of array manipulation |
| | CLO3 | Apply the concept of record (a C++ struct) |
| | CLO4 | Apply modular programming techniques in solving computer problems |
| | CLO5 | Use basic file manipulation techniques |
| | CLO6 | Use all the fundamental concepts in structured programming |

| Pre-Requisite Courses | No course recommendations |
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| Topics |
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| **1. One-dimensional array**<br>1.1) Introduction to array<br>1.2) Array declaration and initialization<br>1.3) Input values into array<br>1.4) Accessing elements of an array<br>1.5) Array operations using 7 basic algorithms ( min, max, count, total, average, sort (bubble), search (sequential))<br>1.6) Array and function<br>1.7) Passing Array as parameter to function<br>1.8) Passing Array element as parameter to function |
| **2. Two-dimensional (2D) Arrays**<br>2.1) 2D array declaration and initialization<br>2.2) Accessing and printing array components<br>2.3) 2D array operations using 7 basic algorithms : min, max, count, total, average, sort (bubble), search (sequential) entire array by row by column<br>2.4) 2D array string manipulation ( Sort, Search)<br>2.5) Application of multi dimensional array (Example : matrix, game)<br>2.6) Array of records<br>2.7) 2D Array and function<br>2.8) Passing 2D Array as parameter to function<br>2.9) Passing 2D Array element as parameter to function |
| **3. Records (Structs)**<br>3.1) Record operations<br>3.2) Record definition<br>3.3) Record variable declaration<br>3.4) Accessing record members<br>3.5) Record assignment<br>3.6) Comparing record members<br>3.7) Arrays and records |

3.8) Array of records
3.9) Array of record members
3.10) Record and function
3.11) Pass record variable as parameter
3.12) Pass record member as parameter
3.13) Return record using parameter
3.14) Return record using returned type

**4. Fundamentals of Data Files**
4.1) Processing Text Files
4.2) Introduce the six step process
4.3) File operation: Read data from file
4.4) File operation: Write data into file
4.5) File operation: Display data from file to console
4.6) File processing
4.7) Read data from file and store into array
4.8) Read data as record
4.9) Pass file variable into function as parameter

| Assessment Breakdown | % |
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| Continuous Assessment | 100.00% |

| Details of Continuous Assessment | Assessment Type | Assessment Description | % of Total Mark | CLO |
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| | Assignment | Individual Assignment | 40% | CLO2 |
| | Final Test | Open Book Final Test | 5% | CLO4 |
| | Final Test | Open Book Final Test | 5% | CLO5 |
| | Final Test | Open Book Final Test | 20% | CLO6 |
| | Quiz | Open Book Quiz | 10% | CLO1 |
| | Test | Open Book Test | 20% | CLO3 |

| Reading List | Recommended Text | • D. S. Malik 2018, *C++ Programming: From Problem Analysis to Program Design*, 8th Edition Ed., Cencage Learning [ISBN: 9781337677653] |
|---|---|---|
| | Reference Book Resources | • Jo Ann Smith 2015, *C++ Programs to Accompany Programming Logic and Design*, 8th Edition Ed., Cengage Learning [ISBN: 9781305461741] |
| | | • Paul J. Deitel,Harvey M. Deitel 2017, *C++ how to Program*, 6th Edition Ed., Prentice Hall [ISBN: 9780134596327] |
| | | • Tony Gaddis 2016, *Starting Out with C++*, 8th Edition Ed., Pearson [ISBN: 9780134037325] |
| Article/Paper List | This Course does not have any article/paper resources | |
| Other References | This Course does not have any other resources | |