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| ***logobb*** | FAKULTI SAINS KOMPUTER DAN TEKNOLOGI MAKLUMAT |

**Course Title :** Programming and Problem-Solving Techniques

**Course Code :** CCS5101

**Credit :** 1(1+0)

**Total Learning Hours:** 40

**Time** : Tuesday 5.00-6.00 pm

**Venue** : Lecture Room 1, FSKTM

**Prerequisite** : -

**Semester :** Semester 2 2024/2025

**Instructor :** Dr. Noridayu Manshor

**E-mail :** [**ayu@upm.edu.my**](mailto:ayu@upm.edu.my)

**Room :** C3-22, Level 3 Block C, FSKTM

**Objectives:**

Student able to:

1. identify problem-solving techniques by developing algorithms and building programs. (C4, CTPS).
2. code programs using a selected programming languages with good programming techniques. (P4, DS)
3. mencadang penyelesaian masalah dengan menggunakan teknik pengaturcaraan yang terkini. (A3, LL)

**Synopsis:**

This course covers fundamental programming and problem-solving skills. Problem analysis, algorithm design, and solution implementation using a variety of programming languages and tools are emphasised.

| WEEK | TOPIC |
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| 1 | **Topic 1**: Problem Solving Techniques based on Computer   * Software development methods * Requirement specification and problem analysis |
| 2 | **Topic 2**: Algorithm Design Pseudocode and flowchartValidation Testing |
| 3 - 4 | **Topic 3**: Basic Data Types and Operations   * Data types, identifiers, variables and constants * Operation and data conversion * Input/output from console |
| 5 - 6 | **Topic 4**: Problem Solving with Selection Control   * Selection Structure * If Statement and Two-Way Selection Statements * Nested Selection Statements |
| 7 - 8 | **Topic 5**: Problem Solving with Repetition   * While, do-while and for loops * Nested loops |
| 9 - 10 | **Topic 6**: Programming with Methods   * + Define and call subroutine   + Passing parameters with values and references   + Scope of Variables |
| 11 - 12 | **Topic 7**: Array   * Basics of Arrays * Passing and returning 1-dimensional arrays via parameters * Operations on arrays * Two-dimensional arrays * Passing and returning 2-dimensional arrays via parameters * Multidimensional arrays |
| 13 - 14 | **Topic 8:** String   * String and character classes * String and character operations * String formatting |

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| Course Evaluation | **Knowledge &Understanding (%)** | **Cognitive Skill** | **Practical Skill (%)** | **Digital skills (%)** | **Personal Skill (%)** | **Total (%)** |
| Assignment | 40 | 20 | 10 |  |  | 70 |
| Project |  |  |  | 10 | 20 | 30 |

###### **Reference Books**

1. Carrano, F. M. & Henry, T. M. (2021). *Data structures and abstractions with J ava* (5th ed.). Pearson Education.
2. Deitel, H. M. & Deitel, P. J. (2021). *Java how to program, early objects* (11th ed.)*.* Pearson Education.
3. Liang, Y. D. (2021). *Introduction to Java programming and data structures* (12th ed.)*.* Pearson Education Limited.
4. Savitch, W. (2021). *Java: An introduction to problem solving and programming* (8th ed.)*.* Pearson Education Limited.
5. Sprankle, M. & Hubbard, J. (2012). *Problem solving & programming concepts* (9th ed.)*.* Pearson Education Limited.

Course material: PutraBlast [(www.learninghub.upm.edu.my](http://(www.learninghub.upm.edu.my))