**MINISTRY OF EDUCATION, MALAYSIA**

**VOCATIONAL COLLEGE STANDARD CURRICULUM**

**COURSE INFORMATION**

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| **COURSE NAME** | **:** |  | **APPLICATION BUG FIXING** | |
| **CODE NAME** | **:** |  | **KPD4015** | |
| **LEVEL** | **:** |  | **3 SEMESTER 4** | |
| **CREDIT UNIT** | **:** |  | **5** | |
| **CONTACT HOUR** | **:** |  | **FACE TO FACE** | **: 8 HOURS/WEEK** |
|  |  |  | **NON FACE TO FACE** | **:** |
| **COURSE TYPE** | **:** |  | **VOCATIONAL** | |
| **PREREQUISITE**  **CORE REQUISITE** | **:**  **:** |  | **-**  **-** | |

**COURSE OUTCOMES**

At the end of the course, the students should be able to:-

The person who is competent in this CU shall be able to ensure that the application developed is error free. Upon completion of this CU trainee shall be able to:

* Interpret bug report
* Simulate bug/error scenario
* Debug application code
* Commit fixed source code

**COURSE DESCRIPTION**

Application bug fixing is a process of tracking and removing error, flaw, failure, or fault in an application that causes it to produce an incorrect or unexpected result, or to behave in unintended ways.

The person who is competent in this CU shall be able to interpret bug report, simulate bug/error scenario, debug application code, and commit fixed source code.

The outcome of this competency is to ensure that the application developed is error free.

**CONTENT AND LEARNING STANDARDS**

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| **PROGRAM** | **:** | **TEKNOLOGI PENGURUSAN PANGKALAN DATA DAN APLIKASI WEB** |
| **COURSE NAME** | **:** | **APPLICATION BUG FIXING** |
| **CODE NAME** | **:** | **KPD 4015** |

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| **CONTACT HOURS**  **(TRAINING DURATION)** | **CONTENT STANDARD**  **(WORK ACTIVITIES)** | **LEARNING STANDARD**  **(RELATED KNOWLEDGE / APPLIED SKILLS / ATTITUDE / SAFETY / ENVIROMENTAL)** | **PERFORMANCE CRITERIA /**  **ASSESSMENT CRITERIA** |
| **15 HOURS**  **(3 WEEKS)**  Related Knowledge  (5 Hours)  1 Week  Applied Skills  (10 Hours)  2 Weeks | **1.0 INTERPRET BUG REPORT** | **Related knowledge**   1. Definition of bug 2. Bug tracking software 3. Purpose of knowledgebase 4. End User License Agreement (EULA) 5. Types of error classification such as:  * Application based error * Server based error * User based error  1. Cause of error such as:  * Server down time * Unexpected user action * Unexpected application behaviour  1. Level of qualified severity such as:  * Critical * High * Low * Blocker/show stopper * Trivial   **Applied Skills**   1. Obtain bug report 2. Identify types of error 3. Identify error triggered environment 4. Identify cause of error 5. Identify severity of error   *Attitude:*   1. Proactive when interpreting bug report 2. Resourceful when interpreting bug report 3. Committed when interpreting bug report 4. Analytical thinking when interpreting bug report 5. Adhere to End User License Agreement (EULA)   *Safety/Environment*:   1. Adhere to workplace ergonomics practice | **Assessment Criteria**   1. Definition of bug explained 2. Purpose of bug tracking software explained 3. Purpose of knowledgebase explained 4. End User License Agreement (EULA) explained 5. Types of error classification listed 6. Cause of error listed 7. Level of qualified severity listed 8. Types of error confirmed 9. Error triggered environment confirmed 10. Severity of error confirmed   **Performance Criteria**   * 1. Classification of error (unresponsive input, cosmetic error, navigation error, out of memory error, unexpected error or server error) identified according to bug report   2. Cause of error (server down time, unexpected usage or unexpected application behaviour) confirmed according to bug report |

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| **20 HOURS**  **(4 WEEKS)**  Related Knowledge  (10 Hours)  2 Weeks  Applied Skills  (10 Hours)  2 Weeks | **2.0 SIMULATE BUG/ERROR SCENARIO** | **Related knowledge**   1. Error reproduce procedure 2. Types of error triggered environment such as:  * Hardware configuration * Software configuration * Network configuration  1. Types of unexpected user action such as:  * Unexpected data input * Multiple user attempt * Unexpected navigation pattern  1. Types of error impact such as:  * Data lost * System crash * System unresponsive * System malfunction   **Applied Skills**   1. Reproduce application error scenario      1. Check application error occurrence 2. Identify impact of error   *Attitude:*   1. Proactive when simulating bug/error scenario 2. Resourceful when simulating bug/error scenario 3. Committed when simulating bug/error scenario 4. Analytical thinking when simulating bug/error scenario   *Safety/Environment*:   1. Adhere to workplace ergonomics practice | **Assessment Criteria**   * 1. Error reproduce procedure explained   2. Types of error triggered environment listed   3. Types of unexpected user action listed   4. Types of error impact listed   5. Bug/error scenario occurrence confirmed   6. Impact of error confirmed   **Performance Criteria**   * 1. Application error scenario reproduced according to bug report   2. Application error occurrence confirmed according to bug report |

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| **40 HOURS**  **(8 WEEKS)**  Related Knowledge  (15 Hours)  3 Weeks  Applied Skills  (25 Hours)  5 Weeks | **3.0 DEBUG APPLICATION CODE** | **Related knowledge**   1. Debugging procedure 2. Purpose of custom error page 3. Types of custom error page such as:  * Under maintenance * File not found //404 * Network lost//505  1. Debugging tools 2. Turnaround time 3. Types of testing such as:  * Functional test * File test * Data integrity test   **Applied Skills**   1. Retrieve application source code from source code repository 2. Identify affected source code 3. Refer knowledgebase 4. Isolate affected source code 5. Apply custom error page during fixing period 6. Fix affected source code within turnaround time 7. Reproduce initial error scenario 8. Check no bug occurrence 9. Check bug fixed   *Attitude:*   1. Proactive when debugging application code 2. Resourceful when debugging application code 3. Committed when debugging application code 4. Analytical thinking when debugging application code 5. Follow fixing turnaround time   *Safety/Environment*:   1. Adhere to workplace ergonomics practice | **Assessment Criteria**   1. Debugging procedure explained 2. Purpose of custom error page explained 3. Types of custom error listed 4. Debugging tools listed 5. Turnaround time explained 6. Types of testing listed 7. Custom error page developed 8. Affected source code fixed   **Performance Criteria**   * 1. Application source code retrieved from source code repository   2. Cause of error identified according to bug report   3. Affected source code fixed according to debugging procedure   4. Initial error scenario reproduced according to bug report   5. No bug occurrence confirmed according to simulation result   6. Bug fixes confirmed according to simulation result |

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| **10 HOURS**  **(2 WEEKS)**  Related Knowledge  (5 Hours)  1 Week  Applied Skills  (5 Hours)  1 Week | **4.0 COMMIT FIXED SOURCE CODE** | **Related knowledge**   1. Maintenance of source code such as:  * SCM * Version control  1. Source code distribution method such as:  * Pull * Push * Check out * Commit * Update  1. Format of work progress report   **Applied Skills**   1. Publish fixed source code to source code repository 2. Update knowledgebase 3. Update work progress report 4. Report fixed source code submission to superior   *Attitude:*   1. Proactive when debugging application code 2. Resourceful when debugging application code 3. Committed when debugging application code 4. Analytical thinking when debugging application code 5. Follow fixing turnaround time   *Safety/Environment*:   1. Adhere to workplace ergonomics practice | **Assessment Criteria**   1. Function of source code maintenance explained 2. Source code distribution method listed 3. Fixed source code transferred to source code repository 4. Updated work progress report submitted to superior   **Performance Criteria**   * 1. Fixed source code published to source code repository   2. Bug fixes status reported to superior |

**Employability Skills**

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| **Core Abilities** | **Social Skills** |
| 01.01 Identify and gather information.  01.02 Document information procedures or processes.  01.03 Utilize basic IT applications.  02.01 Interpret and follow manuals, instructions and SOP's.  02.03 Communicate clearly.  02.04 Prepare brief reports and checklist using standard forms.  02.05 Read/Interpret flowcharts and pictorial information.  03.02 Demonstrate integrity and apply practical practices.  03.03 Accept responsibility for own work and work area.  03.04 Seek and act constructively upon feedback about work performance.  03.06 Respond appropriately to people and situations.  03.07 Resolve interpersonal conflicts.  06.01 Understand systems.  06.02 Comply with and follow chain of command.  06.03 Identify and highlight problems.  06.04 Adapt competencies to new situation systems.  01.04 Analyze information.  01.05 Utilize the Internet to locate and gather information.  01.06 Utilize word processor to process information.  02.07 Utilize Local Area Network (LAN)/Intranet to exchange information.  02.08 Prepare pictorial and graphic information.  03.08 Develop and maintain a cooperation within work group.  04.01 Organize own work activities.  04.02 Set and revise own objectives and goals.  04.03 Organize and maintain own workplace.  04.04 Apply problem solving strategies.  04.05 Demonstrate initiative and flexibility.  06.05 Analyse technical systems.  06.06 Monitor and correct performance of systems.  01.07 Utilize database applications to locate and process information.  01.08 Utilize spreadsheets applications to locate and process information.  01.10 Apply a variety of mathematical techniques.  01.11 Apply thinking skills and creativity.  02.09 Prepare flowcharts.  02.10 Prepare reports and instructions.  02.11 Convey information and ideas to people.  03.15 Liaise to achieve identified outcomes.  05.01 Implement project/work plans.  05.02 Inspect and monitor work done and/or in progress. | 1. Communication skills 2. Conceptual skills 3. Interpersonal skills 4. Learning skills 5. Leadership skills 6. Multitasking and prioritising 7. Self-discipline 8. Teamwork |

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| **Tools, Equipment and Materials (TEM)** | |
| **ITEMS** | **RATIO (TEM : Trainees)** |
| Computer set  Internet connection  Source Code Management (SCM) software  IDE software with debugging features  Software Development Kit (SDK)  Database Management System (DBMS)  Bug tracking software  Word processing software  Computer with server role  Stationeries | 1:1  As required  1:1  1:1  1:1  1:1  1:1  1:1  1:25  As required |

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| **Reference** |
| **REFERENCES** |
| 1. Kent Beck (2002), Test Driven Development: By Example (1st Edition), Addison-Wesley Professional, ISBN 978-0321146533 2. Paul Butcher (2009), Debug It!: Find, Repair, and Prevent Bugs in Your Code (Pragmatic Programmers) (1st Edition),Pragmatic Bookshelf, ISBN 978-1934356289 3. Andrew Hunt, David Thomas (1999), The Pragmatic Programmer: From Journeyman to Master (1st Edition), Addison-Wesley Professional, ISBN 078-5342616224 4. Matthew Linderman, Jason Fried (2004) , Defensive Design for the Web: How to improve error messages, help, forms, and other crisis points(1st Edition), New riders), ISBN 978-0735714106 5. Tobias Klein (2011), A Bug Hunter's Diary: A Guided Tour Through the Wilds of Software Security(1st Edition), No Starch Press ISBN 978-1593273859 |

**Disediakan oleh:**

**KEMENTERIAN PENDIDIKAN MALAYSIA**

**OCT 2018**