**FACULTY OF MANUFACTURING ENGINEERING**

**UNIVERSITI MALAYSIA PAHANG**

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| **1** | **Course Code and Name** | BfF1113 engineering materials |
| **2** | **Semester / Year** | Semester 1 / Year 1  |
| **3** | **Program Level / Category** | Bachelor Degree / Materials |
| **4** | **Unit** | 3 Credits |
| **5** | **Prerequisite Course** |  NIL |
| **6** | **Contact Hours** | Lecture  | 2 unit  | 2 H X 14 weeks  |
| Tutorial | 0.5 unit | 1 H X 14 weeks |
| Laboratory | 0.5 unit  | 1 H X 14 weeks |
| **7** | **Course Synopsis** | This course introduces the fundamental concepts of engineering materials which includes the structure of materials, mechanical and physical properties of materials, binary phase diagrams, TTT diagram, heat treatment, applications and current developments of metal, polymer, ceramic, composite and advanced materials. Also, basic understanding on the environmental degradation of engineering materials. |
| **8** | **Course Outcomes** | By the end of semester, students should be able to: |
| CO1: | Gain fundamental concepts on the classification of various engineering materials. |
| CO2: | Perform structure-property correlations for engineering materials based on the microstructures. |
| CO3: | Analyse binary phase diagrams, TTT diagram, cooling curve, and correlate with microstructures and properties. |
| CO4: | Evaluate the criteria in the selection of materials.  |
| CO5: | Recognize the importance of sustainable materials. |
| **9** | **CO-PO Mapping** |  **CO/PO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** |  |  |  |  |  |  |  |  |  |  |  |  |
| **CO2** |  |  |  |  |  |  |  |  |  |  |  |  |
| **CO3** |  |  |  |  |  |  |  |  |  |  |  |  |
| **CO4** |  |  |  |  |  |  |  |  |  |  |  |  |
| **CO5** |  |  |  |  |  |  |  |  |  |  |  |  |
|  **10** | Assessment Methods | Distribution (%) | CO1 | CO2 | CO3 | CO4 | CO5 |
| Assignment | 15%  |  |  |  |  |  |
| Test 1 |  15% |  |  |  |  |  |
| Test 2 |  15% |  |  |  |  |  |
| Final Examination | 40%  |  |  |  |  |  |
| Lab Report  | 15%  |  |  |  |  |  |
| Total | 100% |  |
| **11** | Learning References | 1. William D. Callister, Jr., 2011, Materials Science and Engineering: An Introduction, Eight Edition, John Wiley & Sons Inc.
2. Michael F Ashby, 2006, Materials selection in mechanical design, Fourth Edition, McGraw Hill Inc.
3. Serope Kalpakjian, Steven R. Schmid, 2010, Manufacturing Engineering and Technology, Sixth Edition, Prentice Hall International.
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| Revision Date: 22 AUGUST 2015 | Effective: SEMESTER I 2015/2016 |
| Teaching plan reference number: BFF1113R4 |