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| **PRE-REQUISITE** | **:** | **-** |
| **EQUIVALENCE** | **:** |  **-** |
| **LECTURE HOURS** | **:** | **1 hour lecture****6 hours studio** |
| **Lecturers** | **E-Mail** | **Room No.** | **Phone No.** |
| 1. | Badri Abd Ghani | agbadri@fkm.utm.my | C23-231 | 34674 |
| 2. | Razali Sulaiman | razali@fkm.utm.my | C25-415 | 34723 |
| 3. | Dr Md Afendi M. Yusof | affendi@fkm.utm.my | C25-408   |  |
| 4. | Zulkafli Yusoff | zulkafli@fkm.utm.mu | C23-420 | 34682 |
| 5. | Dr Mohd Foad Abd Hamid | mfah@fkm.utm.my | C25-334 | 34750 |
| 6. | Dr Muhamad Noor Harun | mnoor@fkm.utm.my | C23-224 | 34655 |
| 7. | Dr Jamaludin Mohd Taib | jamalt@fkm.utm.my | C23-225 | 34654 |
| 8. | PM Dr Mohamad Kasim Abd Jalil | kasim@fkm.utm.my | C25-335 | 34741 |
| 9. | Afandi Bin Dzakaria | dafandi@fkm.utm.my | C23-222 | 34563 |
| 10. | PM Dr Ardiyansyah Syahrom | ardi@utm.my | C23-410 | 58535 |

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| **SYNOPSIS** This subject introduces student to the use of technical drawing in an effective way for communicating and integrating with engineering concepts. Such environment will provide a platform where the engineer can share and exchange information. This subject will also enlighten the student on the significant changes in the engineering and technical graphic due to the use of computer and CAD (Computer Aided Design) software. At the end of the course, student should be able to apply the skill and knowledge of engineering drawing to interpret design, using graphics method such as geometric drawing, orthographic projection, isometric, machine drawing, detailed drawing, and basic CAD software. |
| **PREPARED BY :** | **CERTIFIED BY :** |
| **Name** **Signature****Date** | ::: | En Badri Abd Ghani17 February 2015 | **Name** **Signature****Date** | ::: | P.M Dr. Mohammad Hussein17 February 2015 |

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| **COURSE LEARNING OUTCOMES**By the end of the course, students should be able to :

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| **No.** | **Course Learning Outcomes** | **Programme****Learning** **Outcome(s) Addressed** | **Learning Taxonomy & Generic Skill Assessed** | **Assessment Methods** |
| 1. | Identify and define the basic requirements of engineering drawing according to standard | PO1 | C2 | Class assignment, T, PR |
| 2. | Translate objects into geometry and orthographic drawings | PO1, PO2,PO3 | C3 | Class assignment, T, PR |
| 3. | Construct assembly and detail drawing, and solid modeling | PO1, PO2,P05,P09,P11 | C3,P5,A3 | HW, T, PR |
| 4. | Translate objects into sectional and isometric drawings | PO1, PO2,PO3 | C3 | HW, T, PR |

Note :(T – Test ; PR – Project ; Q – Quiz; HW – Homework ; Pr – Presentation; F – Final Exam) |
| **STUDENT LEARNING TIME**

|  |  |  |
| --- | --- | --- |
| **No.** | **Teaching and Learning Activities** | **Student Learning Time (hours)** |
| 1. | Face to Face* Lectures
* Practical / Tutorial/Studio
* SCL Activities
 | 10564 |
| 2. | Independent Study* Non-face to face learning
* Revision
* Preparation for Assessment
 | 81818 |
| 3. | Formal Assessment* Continuous Assessment
* Final Exam
 | 60 |
| **Total** | **120** |

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| **TEACHING METHODOLOGY**1. Lecture will given to expose the student on the principle of engineering drawing
2. Students are required to attend studio to have an hand-on practice on engineering drawing
3. Students are required to produce a complete production on selected product for the project
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| **WEEKLY SCHEDULE**

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| --- | --- | --- |
| **Week** | **Lecture** | **Topic / Content** |
| 1 | 1 hrStudio | Introduction to Engineering Drawing and computer aided design (CAD)• Drawing tools and CAD• Standard practices – BS1111 and ISO standards• Lettering and basic dimensioning• Engineering drawing line typesHands on manual drawing and using CAD |
| 2-4 | 3 hrsStudio | Geometry• Dimension • Basic drawing construction – tangencies• Drawing basic geometric shape using circle, ellipse, polygon• Basic CAD editing technique• Setting up engineering drawing and CAD standard : drawing title block, dimensioning and layering• Produced scale drawing and hard copy (printing)Exercise: 5 (CAD) and 3 (manual) |
| 6-7 | 2hrsStudio (W7)Studio | Orthographic• Definition• First and third angle projection theory• CAD projection technique: coordinate point filters, construction line drawing and layering techniqueTest 1 (CAD)Exercise: 3 (CAD) and 2 (manual) |
| **8** |  | **MID SEMESTER BREAK** |
| 9-10 | 2 hrsStudio (W10) | Isometric• Definition• Isometric drawing concept• CAD drawing technique – setting up isometric plane and control • 3D solid Modelling – general concepts and commandsProject  |
| 11-12 | 2 hrsStudio | Section drawing• Sectioning concepts • Full section, half section, section line etc• Drawing layoutProject |
| 13 | 1 hrStudio | Machine drawing• Bolt and nut• Standard symbols using CADProject |
| 14-15 | 2 hrsStudio (W14)Studio (W15) | Production drawing • Prepare Bill of Material (BOM)• Assembly drawingTest 2 (Manual)Project |

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| **REFERENCES** |
| 1.2.3.4.5.6. | David L. Goetsch, William S. Chalk, John A. Nelson and Raymond L. Rickman (2005), Technical Drawing , Fifth edition, Thomson Delmar LearningJames M. Kirkpatrick (2003), Basic Drafting Using Pensil Sketches and AutoCAD, Prentice HallKhairul Anwar Hanafiah (2006), Lukisan kejuruteraan berbantu computer, Edisi kedua, Penerbit UTMKhairul Anwar Hanafiah (2003), Latihan AutoCAD SMJ1503 – versi 2, CD – ROM formatMohd Fadzil Daud dan Khairul Anwar Hanafiah (2005), Panduan asas lukisan kejuruteraan, Edisi kedua, Penerbit Mohd Ramzan Manial, Yahya Samian dan Badri Abdul Ghani (1996), Lukisan kejuruteraan asas, Edisi kedua, Penerbit UTM  |
| **GRADING**

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| --- | --- | --- | --- | --- |
| **No.** | **Assessment** | **Number** | **% each** | **% total** |
| 1. | Test 1 | 1 | 20 | 20 |
| 2. | Test 2 | 1 | 20 | 20 |
| 3. | Project | 1 | 30 | 30 |
| 4. | Homework (Manual) | 8 | 2 | 10 |
| 5. | Homework (CAD) | 5 | 2 | 20 |
|  | **Overall Total** | **100** |

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| **ATTENDANCE** The student should adhere to the rules of attendance as stated in the University Academic Regulation :- |
| 1. | Student must attend not less than 80% of lecture hours as required for the subject. |
| 2. | The student will be prohibited from attending any lecture and assessment activities upon failure to comply the above requirement. Zero mark will be given to the subject. |