**ENGT 131 – Maintenance Fundamentals**

**Master Syllabus**

**Course: ENGT 131 – Maintenance Fundamentals**  **Course Credits:** 3-2-4

**ICCB Code: PCS #:** 1.2470303

**Mode of Delivery:** Traditional or hybrid **IAI #:**  (if applicable)

**Instructor**: John Daum **Dev/Rev Date**: 04/17/13

**Phone: 217-875-7211 Ext:447**

**Email: jdaum@richland.edu**

**Projected Date of Initial Offering:** Fall 2013

**Course Prerequisite:** MATH 091 and eligibility for ENGL 101 or approval of instructor.

**Course Description:**

**ENGT 131 – Maintenance Fundamentals** provides an introductory understanding of the maintenance procedures utilized in modern industrial processes. The maintenance management concepts of total productive maintenance (TPM) including routine, preventative, predictive, are integrated throughout this course. Topics include the skills and knowledge to perform housekeeping, preventive and routine maintenance of the manufacturing systems which are common in local factories and processing plants. Machine systems covered include mechanical, electrical, pneumatic, hydraulic, lubrication, belts and chains, bearings, couplings, and automation. Students will work with technical handbooks, manufacturers’ catalogs, and trade literature to solve maintenance problems. Theory gained in the classroom is applied in laboratory-based exercises.

This course has been modified to meet the requirements of the Manufacturing Skill Standards Council (MSSC) and prepares the student for the Module 4: Maintenance Awareness Exam for the Certified Production Technician (CPT) certification.

*Applicable toward graduation where program structure permits:*

Certificate or Degree – All certificates, AAS, ALS

Group Requirement – Not Applicable

Area of Concentration – Not Applicable

**Text(s):**

* High-Performance Manufacturing, by MSSC, Glencoe/MacGraw-Hill.,

ISBN 0-07-861487-2 (2006) (required)

* IPT’s Industrial Trades Training Manual: Power Transmission Systems, Copyright 1989, Bruce M. Basaraba, ISNB 0-920855-10-5 (recommended)
* Audel Mechanical Trades Pocket Manual, Copyright 2004, Wiley Publishing, Thomas Bieber Davis and Carl Nelson Sr., ISBN 0-7645-4170-6 (recommended)
* Lab Exercises provided by instructor.

**Required Classroom/Lab Materials**

Safety Glasses

Scientific Calculator

Notebook and Mechanical Pencil

USB flash drive

Shop coat (optional)

**Course Objectives/Outcomes:** The student will obtain the following skills and attitudes by completion of this course:

|  |  |
| --- | --- |
| **Course Outcomes:** | **RCC Cross-Disciplinary Outcomes:**  |
| Perform preventive maintenance and routine repair | 4 |
| Monitor indicators to ensure correct operations | 3 |
| Perform all housekeeping to maintain production schedule | 4 |
| Recognize potential maintenance issues with basic production | 2 |
| Determining when to inform maintenance personnel about problems | 4 |
| Perform lock out and tag out procedures | 4 |
| Inspect motors, shaft alignment, and couplings systems | 4 |
| Inspect belt and chain drive systems | 4 |
| Inspect basic electrical systems | 4 |
| Inspect basic lubrication systems | 4 |
| Inspect automation systems | 4 |
| Prepared to take the MSSC Module 4: Maintenance Awareness Exam for the Certified Production Technician (CPT) certification. | 1, 2, 3 |

***Cross-Disciplinary Outcomes Legend:***

1. *The degree-seeking student will be able to communicate effectively (read, write, speak and listen).*
2. *The degree-seeking student will think critically and creatively.*
3. *The degree-seeking student will manage technology and evaluate information in various research and applied contexts.*
4. *The degree-seeking student will act professionally and responsibly.*

**Topical Outline:**

|  |  |  |
| --- | --- | --- |
| **Week** | **Content**  | **Labs** |
| Week 1 | Maintenance management |  |
| Week 2 | Routine, preventative, and predictive basics |  |
| Week 3 | Production monitoring and corrective actions |  |
| Week 4 | Safety procedures | Lab #1 |
| Week 5 | Tools and housekeeping | Lab #2 |
| Week 6 | Electrical power systems | Lab #3 |
| Week 7 | Electrical control systems | Lab #4 |
| Week 8 | Belt Drives | Lab #5 |
| Week 9 | Chain drives (Midterm) | Lab #6 |
| Week 10 | Bearings and couplings | Lab #7 |
| Week 11 | Lubrication systems | Lab #8 |
| Week 12 | Motor alignment procedures | Lab #9 |
| Week 13 | Pneumatic systems | Lab #10 |
| Week 14 | Hydraulic systems | Lab #11 |
| Week 15 | Automated systems |  |
| Week 16 | Identifying abnormal equipment conditions | Lab #12 |
| Week 17 | Finals |  |

**Methods of Evaluation:**

**Grading:** Labs and projects 30% A = 90 - 100

 Tests and quizzes 30% B = 80 - 89

 Final 20% C = 70 – 79

 Presentations and reports 10% F = 69 or below

 Class participation and teamwork 10%

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