☑ REQUIRED COURSE          ☑ NEW COURSE
☐ ELECTIVE COURSE          ☐ REVISION

# Lake Land College
Course Information Form

| COURSE NUMBER: | APT-045 | TITLE: *(30 Characters Max)* | | Total Productive Maintenance | | | | |
|---|---|---|---|---|---|---|---|---|
| SEM CR HRS: | 0.5 | Lecture: | | 0.5 | Lab: | 0.5 | ICCB Lab: 0.5 | ECH: 1.0 |

| Course Level: | ☐ Gen Ed/IAI | ☑ Career/Technical | Clinical Practicum: | 0.0 | Work-based Learning: | 0.0 | WBL ECH: | 0.0 |
|---|---|---|---|---|---|---|---|---|
| | ☐ Baccalaureate/Non-IAI | ☐ Dev Ed/Not in Degree Audit | | | | | | |

| COURSE PCS # | 12 - 15.0407 | IAI Code: | N/A | Contact Hours (Minutes/Week) |
|---|---|---|---|---|

| Repeatable (Y/N): | N | Pass/Fail (Y/N): | N | Variable Credit (Y/N): | N | Min: | Max: | 16 Wks | 50 | 8 Wks | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Prerequisites: | None |
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| Corequisites: | None |
| Catalog Description: (40 Word Limit) | In this class, students will learn what Total Productive Maintenance is, how to calculate and optimize overall equipment effectiveness and types of predictive maintenance operations as well as root cause troubleshooting techniques. (Meets SACA Automation Specialist I C-211 Industry 4.0 Total Productive Maintenance Management credential.) |

| List the Major Course Segments (Units) | Contact Lecture Hours | Contact Lab Hours | Clinical Practicum | Work-based Learning |
|---|---|---|---|---|
| Standard 211.1 Identify elements of a Total Productive Maintenance (TPM) | 1 | 1 | | |
| Standard 211.2 Optimize overall equipment effectiveness (OEE) | 1 | 2 | | |
| Standard 211.3 Perform planned and unplanned maintenance operations | 1 | 2 | | |
| Standard 211.4 Perform preventive maintenance operations | 1 | 2 | | |
| Standard 211.5 Identify types of predictive maintenance operations | 1 | 1 | | |
| Standard 211.6 Configure and use a cloud-based maintenance management system | 1 | 2 | | |
| Standard 211.7 Use systems troubleshooting techniques to locate root cause | 2 | 2 | | |
| TOTAL | 8 | 12 | 0 | 0 |

## EVALUATION

| QUIZZES ☑ | EXAMS ☑ | ORAL PRES ☑ | PAPERS ☑ |
|---|---|---|---|
| LAB WORK ☑ | PROJECTS ☐ | COMP FINAL ☑ | OTHER ☐ |

## COURSE MATERIALS

| TITLE: | Elearning | |
|---|---|---|
| AUTHOR: | Amatrol | |
| PUBLISHER: | | |
| VOLUME/EDITION/URL: | | |
| COPYRIGHT DATE: | | |

| MAJOR COURSE SEGMENT | HOURS | LEARNING OUTCOMES |
|---|---|---|
| | | *The student will be able to:* |
| Standard 211.1 Identify elements of a Total Productive Maintenance (TPM) | 2 | Performance Indicator 1. Identify elements of TPM. Knowledge Indicator 1. Define TPM and explain its benefits. 2. Define autonomous maintenance and explain its benefits. |
| Standard 211.2 Optimize overall equipment effectiveness (OEE) | 3 | Performance Indicator 1. Calculate OEE. 2. Optimize OEE to meet production requirements. Knowledge Indicator 1. Define OEE. 2. Describe methods of eliminating downtime. |

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| Standard 211.3 Perform planned and unplanned maintenance operations | 3 | Performance Indicator<br>1. Perform planned maintenance operation.<br>2. Perform unplanned maintenance operation.<br>3. Record information in maintenance records.<br>4. Interpret a maintenance work order.<br>5. Use approved procedures to notify production personnel of maintenance pending and completed.<br>Knowledge Indicator<br>1. Describe the steps of planned and unplanned maintenance.<br>2. Describe types and criticality of planned and unplanned maintenance.<br>3. Define a maintenance work order and explain its use. |
| Standard 211.4 Perform preventive maintenance operations | 3 | Performance Indicator<br>1. Perform preventive maintenance operations.<br>2. Record information in preventive maintenance records.<br>3. Clean a machine.<br>4. Identify sources and eliminate contamination.<br>Knowledge Indicator<br>1. Define preventive maintenance.<br>2. Describe how contamination is quantified.<br>3. Describe the requirements for safe machine cleaning. |
| Standard 211.5 Identify types of predictive maintenance operations | 2 | Performance Indicator<br>1. Identify types of predictive maintenance operations.<br>Knowledge Indicator<br>1. Describe types of predictive maintenance and their applications.<br>2. Describe applications of predictive analytics. |
| Standard 211.6 Configure and use a cloud-based maintenance management system | 3 | Performance Indicator<br>1. Configure and use a cloud-based maintenance management system.<br>2. Configure teams in a cloud-based maintenance management system.<br>3. Configure escalation in a cloud-based maintenance management system.<br>4. Analyze computer-based maintenance records.<br>5. Initiate and respond to cloud-based maintenance. notifications.<br>Knowledge Indicator<br>1. Describe the operation of a cloud-based maintenance management system.<br>2. Describe the advantages of features of a cloud-based maintenance management system. |
| Standard 211.7 Use systems troubleshooting techniques to locate root cause | 4 | Performance Indicator<br>1. Use 5 senses, observation, and interview techniques to collect information about a machine malfunction.<br>2. Use 5 whys to identify root causes of a machine malfunction.<br>3. Use maintenance records and other machine documentation to analyze a machine malfunction.<br>4. Use troubleshooting flow charts to isolate a malfunction cause.<br>5. Isolate machine malfunctions to a sub system.<br>6. Use systems troubleshooting methodologies to locate sources of a malfunction.<br>Knowledge Indicator<br>1. Describe types of systems troubleshooting methodologies.<br>2. Describe how maintenance records can be used |
| | 20 | |

| Outcomes* | At the successful completion of this course, students will be able to: |
|---|---|
| Course Outcome | Standard 211.1 Identify elements of a Total Productive Maintenance (TPM). |
| Course Outcome | Standard 211.2 Optimize overall equipment effectiveness (OEE). |

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| Course Outcome | Standard 211.5 Identify types of predictive maintenance operations. |
| Course Outcome | Standard 211.6 Configure and use a cloud-based maintenance management system. |
| Course Outcome | Standard 211.7 Use systems troubleshooting techniques to locate root cause. |
| Primary Laker Learning Competency | Creative Thinking & Problem Solving: Students think creatively to solve problems. |
| Secondary Laker Learning Competency | Communication: Students communicate through the exchange of information. |

*Course and program outcomes will be used in the software for outcomes assessment and should include at least 1 primary and 1 secondary Laker Learning Competency. Limit to 3-5.*