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| UNIVERSITY OF TECHNOLOGY AND EDUCATION HCM CITY**FACULTY OF VEHICLE AND ENEGRY ENGINEERING** | **Major : Thermal Engineering Technology Level : Bachelor** |

**COURSE SYLLABUS**

1. **Course name :**Special Topics in Refrigeration Technology **Course code :**STRT321732
2. **Credits :**2credits (2/0/4) (2theory credits, 0 practice credits )
3. **Lecturers**

1/ Main lecturer :LêXuânHòa

2/ Teaching lecturer :

 - HoàngAnQuốc.

 -Đoàn Minh Hùng.

1. **Require course**

Require course : no

Pre-courses:compressor and refrigeration equipments

1. **Course Description)**

This course equipped about the enhancement of operating, diagnosing and repairing of cooling systems. By the way, it gives the method of automatic control in cooling system.

1. **Course Goals**

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| ***Goals*** |  ***Goal description****(The course aims to provide students with:)* | **Expected Learning Outcome of Program** |
| **G1** | Have the knowledge of operating, diagnosing and repairing in cooling system. Applying enhancing knowledge in thermal engineering techonology | ELO 2 |
| **G2** | Applying specialized knowledge in designing, calculating, testing thermal engineering system | ELO 3 |
| **G3** | Analyze, explain and reason to solve thermal problems | ELO 5 |
| **G4** | Attain the ability to think critically and systematically about thermal engineering technology | ELO 7 |

1. **Expected learning outcomes**

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| **Course objectives** | **Description***(After completing program, students are able* | **ELO of Program** |
| **G1** | **G1.2** | Presenting, drawing principles of some equipments and cooling systems. | 1.2.5, 1.2.6, 1.2.9 |
|
| **G1.4** |  Diagnosing, testing in cooling system | 1.3.5 |
| **G2** | **G2.1** | Analyzing, proposing methods to solve problems in cooling systems | 2.1.2, 2.1.6 |
| **G2.4** | Reading materials, drawings. Possess professional ethics and professional working manner in cooling system | 2.4.3, 2.4.5 |
|
| **G3** | **G3.1** | Conceive ideas of cooling systems | 3.1 |
| **G3.2** | Lead, function in teams and communicate well in writing and speaking forms | 3.2 |
| **G4** | **G4.4** | Calculating, designing and stimulating cooling components and systems. | 4.4.4 |

1. **Course Materials**

**-** Textbook:

1. LêXuânHòa – Special Topics in Refrigeration Technology Textbook

**-** Reference book:

[1] Shan K. Wang, Handbook of Air Conditioning and Refrigeration, McGraw – Hill 2001

[2] Ibrahim Dincer, Refrigeration systems and applications, John Wiley & Sons, 2003

1. **Students assessment:**

- Grading scale: **10**

- Assessment plans:

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| **Assessment Method** | **Contents** | **Week** | **Assessment Tool** | **ELO** | **Percent (%)** |
| **Mid Term** |  | **50** |
| BT#1 |  Presenting, drawing and calculating refrigeration circles | 2th week | Exercises | G1.2G4.4 | 10 |
| BT#2 | Analyzing, diagnosing reason and exlaining, proposing methods to solve in cooling systems | 7th week | Exercises | G1.3, G1.4, G2.1 | 10 |
| Report |  | **30** |
| BC#1 | Translating english materials for presenting the report | 4th week | Report | G2.4, G2.5, G3.1, G3.2 | 30 |
| **Final Term** |  |  | **50** |
| Taking role call | Taking role callon the namelist | All term | Namelist | G1.2, G1.3, G1.4, G2.1, G2.4, G2.5, G4.4 |  |

1. **Course content:**

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| **Week** | **Contents** | **ELO** |
| **1÷4** | ***Chapter 1: Troubleshootingairconditioning System <8/0/16>*** |  |
| ***A/* Contents and teaching methods in class***: (8)***Theory teaching contents:**+ Electric part+ Refrigerant system+ Troubleshooting+ Installation fundamentals**Teaching methods**:* Presentation
* Dicussion
* Team working
 | G1.2, G1.3, G1.4, G2.1, G2.4, G4.4 |
| ***B/*Contents for seft-study at home**: *(16)*+ Đọcvàdịchtàiliệu Troubleshooting airconditionsysstem | G2.5, G3.1, G3.2 |
| **5÷6** | ***Chương 2:Electrical Maintenance (4/0/8)*** |  |
| ***A/* Contents and teaching methods in class***: (8)***Theory teaching contents:**+ Unit Wiring+ High Pressure Cutout Switch + High Pressure Cutout Manifold + Condenser Fan and Evaporator Fan Rotation + Electric Heaters**Teaching methods**:* Presentation
* Dicussion
* Team working
 | G1.2, G1.3, G1.4, G2.1, G2.4, G4.4 |
| ***B/* Contents for seft-study at home**: *(8)*Electrical Maintenance | G2.5, G3.1 |
| **7÷12** | ***Chương 3:Refrigeration Maintenance/Service (12/0/24)*** |  |
| ***A/* Contents and teaching methods in class***: (8)***Theory teaching contents:**+ Service Tools+ Compressor Discharge and Suction Service Valves + Gauge Manifold Valve Positions + Gauge Manifold Set (With Low Loss Fittings) Attachment and Purging + Checking Compressor Oil + Refrigerant Leak Test Procedure + Low Side Pump Down + Checking the Refrigerant Charge + Evacuation and Cleanup of the Refrigeration System + Refrigerant Recovery + Using Pressurized Nitrogen + Compressor Replacement + Condenser Coil Replacement + Dehydrator (Filter Drier) or In-Line Filter Replacement + Expansion Valve Replacement + Heat Exchanger Replacement + Receiver Tank Replacement + High Pressure Cutout Switch, Condenser Fan Speed Pressure Switch, or Compressor Discharge Gas Temperature Sensor Replacement + Liquid Line Solenoid Valve Replacement + Liquid Injection Valve Replacement **Teaching methods**:* Presentation
* Dicussion
* Team working
 | G1.2, G1.3, G1.4, G2.1, G2.4, G4.4, G2.5, G3.1, G3.2, |
| ***B/* Contents for seft-study at home**: *(24)*Refrigeration Maintenance/Service | G2.5, G3.1 |
| **13÷15** | ***Chương 4:* Diagnosis** *(6/0/12)* |  |
| ***A/* Contents and teaching methods in class*: (4)*****Theory teaching contents:** + Mechanical Diagnosis+ Refrigeration Diagnosis**Teaching methods**:* Presentation
* Dicussion
* Team working
 | G1.2, G1.3, G1.4, G2.1, G2.4, G4.4, G2.5, G3.1, G3.2 |
| ***B/* Contents for seft-study at home**: *(4)* Diagnosis | G4.4, G2.5 |

1. **Classroom rules of conduct:**

 Students must do home works and projects by themselves. Student will be received zero score If he (or she) violates study regulations or ethics.

1. **Approved date:**
2. **Approvers:**

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| **Dean** | **Head of department** | **Authors** |
|  |  |  |

1. **Syllabus update:**

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| **Time #1: Upgraded issues:**  **date/month/year** | **<**updating authors>Head of Department |