# Course Report of Thermodynamics – MEP 111– Spring 2016

**University:** Ain Shams **Faculty:** Engineering

# Basic Information

## Title and code:

Thermodynamics – MEP 111

## Program on which the course is given:

Mechanical Power Engineering

* 1. **Year / Level of program(s)** 2015-2016 / 2nd year Mechanical Engineering Students.

## Units / Credit Hours:

|  |  |  |
| --- | --- | --- |
| i. | Lecture: | 3 |
| ii. Tutorial / Practical: 1.5 | | |
| iii. Total: 4.5 | | |

1. **Names of lecturers contributing to the delivery of the course:**

Dr. Walid Aboelsoud

Dr. Mostafa Abdelkhalek

**Course coordinator:** Dr. Walid Aboelsoud

**External evaluator:** -------------

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# Statistical Information

No of students attending the course: 392

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Number** | **Percentage (%)** |
| **Students completing the course** | | 392 | 100 |
| **Results** | Passed | 275 | 70 |
| Failed | 117 | 30 |
| **Grading of successful students** | **Percentage** | **Number** | **Percentage (%)** |
| Excellent | | 23 | 5.9 |
| Very Good | | 51 | 13 |
| Good | | 62 | 15.8 |
| Passed | | 139 | 35.5 |
| Weak | | 52 | 13.3 |
| Very weak | | 65 | 16.6 |

# Professional Information

## 1- Course Teaching:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Course Content** | **Lecture**  **(hours)** | **Tutorial**  **(hours)** | **Total** |
| **1** | Introduction and basic concepts ***(Chapter 1).*** | **3** | **1.5** | **4.5** |
| **2** | Energy, energy transfer and energy analysis ***(Chapter 2).*** | **3** | **1.5** | **4.5** |
| **3** | First law of thermodynamics ***(Chapter 2).*** | **3** | **1.5** | **4.5** |
| **4** | Properties of pure substances: phase change,  property diagrams, property tables, EES software and the ideal-gas | **6** | **3** | **9** |
| **5** | Energy analysis of closed systems: energy balance, internal | **9** | **4.5** | **13.5** |
| **6** | Mass and energy analysis of control volumes:  conservation of  mass, flow work, energy analysis of steady-flow | **9** | **4.5** | **13.5** |
| **7** | Thermodynamics’ applications ***(Chapter 5).*** | **9** | **4.5** | **13.5** |
| **8** | Simple-ideal power cycles ***(Chapter 9&10).*** | **3** | **1.5** | **4.5** |
|  | **Total** | **45** | **22.5** | **67.5** |

**Topics taught as percentage of the content specified:**

**ʘ > 90%** **70% - 90%**

**< 70%**

# Reasons in details for not teaching any topic: N/A

**If any topics were taught which are not specified, give reasons in details:**

## None

* 1. **Teaching and learning methods:**

Lectures



Practical training/laboratory

Seminar / workshop

Class activity 

# Case study:

Other assignments / homework

If teaching and learning methods were used other than those specified, list and give reasons: N/A - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

# Studentassessment:

|  |  |
| --- | --- |
| **Method of assessment** | **Percentage of total** |
| Assignments | 5 % |
| Quizzes | 5% |
| Written midterm exam | 15 % |
| Participation in class | 5 % |
| Written final exam | 70% |
| Total | 100% |

**Members of examination committee:**

Dr. Walid Aboelsoud

Dr. Mostafa Abdelkhalek

# Role of the external evaluator

To express his views on the course - - - - - - - - - - - NONE- - - - - - - - - - - -

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# Facilities and teaching materials:

Totally adequate

Adequate to some extent 

Inadequate

## List any inadequacies

* 1. **Administrative constraints**

**List any difficulties encountered**

None - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

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# Student evaluation of the course:

(1) Thermodynamics ﺭﺮﻘﻣ ﻢﻴﻴﻘﺗ ﺞﺋﺎﺘﻧ ﺺﺨﻠﻣ 2016 ﻰﻧﺎﺜﻟﺍ ﻰﺳﺍﺭﺪﻟﺍ ﻞﺼﻔﻟﺍ

|  |  |
| --- | --- |
| ﺎﻜﻴﻧﺎﻜﻴﻣ ﻰﻟﻭﻷﺍ | ﺔﻗﺮﻔﻟﺍ |
| 346 | ﺔﺒﻠﻄﻟﺍ ﺩﺪﻋ |
| Thermodynamics (1) | ﺓﺩﺎﻤﻟﺍ ﻢﺳﺍ |

|  |  |  |  |  |  |  |  |
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| ﻰﻟﺎﻤﺟﺍ | ﻖﻓﺍﻭﺃ | ﻖﻓﺍﻭﺃ | ﺮﻴﻏ | ﻖﻓﺍﻭﺃ ﻻ | ﻖﻓﺍﻭﺃ ﻻ | ﺩﺪﻋ |  |
| ﺀﺍﺭﻷﺍ | ﺓﺪﺸﺑ | ﺪﻛﺄﺘﻣ | ﺓﺪﺸﺑ | ﺔﺒﻠﻄﻟﺍ |
| ﺔﻴﺑﺎﺠﻳﻻﺍ |
| **ﺭﺮﻘﻤﻟﺍ :ﻻﻭﺃ** | | | | | | | |
| 87 % | 23 % | 51 % | 13 % | 7 % | 7 % | 344 | ﻪﻓﺍﺪﻫﺃﻭ ﺭﺮﻘﻤﻟﺍ ﻯﻮﺘﺤﻣ  ﺏﻼﻄﻠﻟ ﺔﻨﻠﻌﻣﻭ ﺓﺩﺪﺤﻣ |
| 79 % | 20 % | 46 % | 13 % | 13 % | 8 % | 344 | / ﻊﺟﺍﺮﻣ / ﺏﺎﺘﻛ ﻪﻟ ﺭﺮﻘﻤﻟﺍ ﺔﻴﻧﻭﺮﺘﻜﻟﺍ ﺔﺨﺴﻧ / ﺕﺍﺮﻛﺬﻣ  ﺔﺣﺎﺘﻣ |
| 87 % | 27 % | 46 % | 14 % | 8 % | 5 % | 344 | ﺚﺤﺒﻟﺍ ﻰﻠﻋ ﻙﺰﻔﺤﻳ ﺭﺮﻘﻤﻟﺍ ﺕﺍﺭﺎﻬﻣ ﻚﺒﺴﻜﻳﻭ ﺮﻴﻜﻔﺘﻟﺍﻭ  ﺔﻴﺳﺪﻨﻫ |
| 73 % | 18 % | 41 % | 14 % | 17 % | 10 % | 344 | ﺔﻴﻓﺎﻛ ﺲﻳﺭﺪﺘﻟﺍ ﺕﺎﻋﺎﺳ |
| 86 % | 23 % | 50 % | 13 % | 8 % | 6 % | 344 | ﺕﺎﻘﻴﺒﻄﺗ ﻞﻤﺸﻳ ﺭﺮﻘﻤﻟﺍ  ﺓﺪﻴﻔﻣ ﻦﻳﺭﺎﻤﺗﻭ |
| 75 % | 19 % | 39 % | 17 % | 16 % | 10 % | 344 | ﺭﺮﻘﻤﻟﺍ ﻦﻣ ﻲﻠﻤﻌﻟﺍ ﺀﺰﺠﻟﺍ  (ﺪﺟﻭ ﻥﺇ) ﺪﻴﻔﻣ |
| **ﺔﻨﺴﻟﺍ ﻝﺎﻤﻋﺃ ﺕﺎﻧﺎﺤﺘﻣﺇ :ًﺎﻴﻧﺎﺛ** | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| 82 % | 18 % | 48 % | 16 % | 10 % | 8 % | 344 | ﺔﻨﺴﻟﺍ ﻝﺎﻤﻋﺃ ﺕﺎﻧﺎﺤﺘﻣﺇ ﺖﻄﻏ  ﺭﺮﻘﻤﻟﺍ ﺕﺎﻳﻮﺘﺤﻣ ﻢﻈﻌﻣ |
| 78 % | 16 % | 45 % | 17 % | 13 % | 10 % | 344 | ﺔﻨﺴﻟﺍ ﻝﺎﻤﻋﺃ ﺕﺎﻧﺎﺤﺘﻣﺇ ﺔﻠﺌﺳﺃ  ﺞﻬﻨﻤﻟﺍ ﻢﻴﻤﺻ ﻲﻓﻭ ﺔﺤﺿﺍﻭ |
| 78 % | 17 % | 46 % | 15 % | 12 % | 10 % | 344 | ﺔﻨﺴﻟﺍ ﻝﺎﻤﻋﺃ ﺕﺎﻧﺎﺤﺘﻣﺇ ﺓﺪﻣ  ﺔﻴﻓﺎﻛ |
| **ﺕﺎﻘﻴﻠﻌﺘﻟﺍ** | | | | | | | |
| ﺭﻮﺘﻛﺩ ﺮﻴﻏ ﺶﻴﻔﻣ ﻢﻬﻓﺮﻌﻧ ﻻ ﻭ ﻝﻭﺩ ﻕﻮﻓ ﻲﻠﻟﺍ ﻞﻛ ﻭ ﻲﺳﻮﺴﺒﻟﺍ ﻡ ﻭ ﻭﺮﻤﻋ ﻡ ﻭ ﺪﻨﻬﻣ ﻡ ﺺﻗﺎﻧ ﺓﺪﻛ  ﻲﻔﻄﺼﻣ ﺭﻮﺘﻛﺩ ﻭ ﺪﻴﻟﻭ | | | | | | | |
| ﺍﺪﺟ ﺪﻴﻔﻣ ﻪﻧﻻ ﻪﺗﺩﺎﻳﺯ ﺐﺠﻳ ﻰﻠﻤﻌﻟﺍ ﺀﺰﺠﻟﺍ | | | | | | | |
| 4 ﻭﺍ 3 ﻭﺍ ﺖﻋﺎﺿ ﺚﻴﺣ ﻪﺒﻳﺮﻏ ﻪﻘﻳﺮﻄﺑ ﺭﺎﺳ ﺭﺮﻘﻤﻟﺍ ﺓﺮﻛﺍﺬﻤﻠﻟ ﺩﺪﺤﻣ ﺭﺪﺼﻣ ﻱﺍ ﻭﺍ ﺏﺎﺘﻛ ﺪﺟﻮﻳﻻ sections ﻲﻓ ﺡﻭﺮﺷ ﻥﺍ ﻢﻟ ﻦﻜﺗ ﺮﻴﻏ ﺓﺪﻴﻔﻣ ﻦﻜﻟﻭ ﺎﻀﻳﺍ ﻢﻟ ﺍﺮﻧ ﻱﺍ ءﻴﺷ ﺎﻬﻨﻣ ﻲﻓ ﻥﺎﺤﺘﻣﻻﺍ ﺎﻤﺑﺮﻟﻭ ﺎﻨﻛ ﻲﺋﺎﻬﻨﻟﺍ ﻥﺎﺤﺘﻣﻻﺍ ﻞﺒﻗ ﻰﺘﺣ ﺪﻳﺍﺰﺘﺗ ﺺﺼﺤﻟﺍ ﺕﺭﺎﺻ ﻪﻨﺴﻟﺍ ﺔﻳﺎﻬﻧ ﻲﻓ ﻥﻻ ﺖﻗﻮﻟﺍ ﺍﺬﻫ ﻝﺍﺰﺘﺧﺍ ﺎﻨﻌﻄﺘﺳﺍ  ﻪﻌﺸﺑ ﺓﺭﻮﺼﺑ ﺮﻴﺒﻛ ﻪﻧﻻ ﺞﻬﻨﻤﻟﺍ ﻲﻓ ءﻴﺸﻟﺍ ﺾﻌﺑ ﺺﻴﻘﻨﺘﻟﺍ ﻥﺎﻜﻣﻻﺎﺑ ﻥﺍ ﻯﺭﺍ ﻦﻴﻣﻮﻴﺑ | | | | | | | |
| (1) Thermodynamics ﺵﺎﻧﺪﻨﻣ | | | | | | | |
| ﺔﻨﺴﻟﺍ ﻝﺎﻤﻋﺃ ﻥﺎﺤﺘﻣﺍ ﻑ ﺍﺪﺟ ﺶﺣﻭ ﺢﻴﺤﺼﺘﻟﺍ | | | | | | | |
| ﻞﺟﻷﻭ ﻢﺛ ،ﻦﻴﺗﺮﺿﺎﺤﻣ ﺮﺧﺁ ﻲﻓ ﺞﻬﻨﻤﻟﺍ ﻦﻣ ﺮﻴﺒﻛ ﺀﺰﺟ ﻂﻐﺿ ﻢﺗﻭ ،ﺔﻴﻓﺎﺿﺇﻭ ﺔﻴﻀﻳﻮﻌﺗ ﺺﺼﺤﻟ ﺎﻨﺠﺘﺣﺍ  !!ﺓﺩﺎﻤﻟﺍ ﻥﺎﺤﺘﻣﻻ ﻖﺑﺎﺴﻟﺍ ﻲﺋﺎﻬﻨﻟﺍ ﻥﺎﺤﺘﻣﻻﺍ ﻡﻮﻳ ﻲﻓﺎﺿﺇ "ﻦﺸﻜﺳ" ﺀﺎﻄﻋﺇ ﻢﺗ ﺎﻤﻬﻴﻠﻋ ﻖﻴﺒﻄﺘﻟﺍ | | | | | | | |
| ﺪﻴﻟﻭ\ﺩ - ﻰﻔﻄﺼﻣ ﻖﻟﺎﺨﻟﺍ ﺪﺒﻋ ﻰﺤﺘﻓ ﻰﻔﻄﺼﻣ \ﺩ- : ﻲﺳﺍﺭﺪﻟﺍ ﻞﺼﻔﻟﺍ ﺍﺬﻫ ﻲﻓ ﺎﻨﻟ ﻩﺩﺎﻤﻟﺍ ﻩﺬﻫ ﺲﻳﺭﺪﺘﺑ ﻡﺎﻗ  ﻂﻘﻓ ﺩﻮﻌﺴﻟﺍ ﻮﺑﺍ ﻱﺩﺎﻬﻟﺍ ﺪﺒﻋ ﺩﻮﻌﺴﻟﺍ ﻮﺑﺍ | | | | | | | |
| **ﻦﻳﺮﺿﺎﺤﻤﻟﺍ** | | | | | | | |
| ﻰﻟﻮﺨﻟﺍ ﺪﻴﺳ ﻰﻔﻄﺼﻣ ﺪﻤﺣﺍ | | | | | | | |
|  | | | | | | | |
| 72 % | 5 % | 11 % | 56 % | 15 % | 13 % | 346 | ﻦﻣ ﻮﻫﻭ ﺮﺿﺎﺤﻤﻟﺍ ﻑﺮﻌﺗ ﻞﻫ |

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|  |  |  |  |  |  |  | ﻚﻟ ﺭﺮﻘﻤﻟﺍ ﺍﺬﻫ ﺲﻳﺭﺪﺘﺑ ﻡﻮﻘﻳ |
| 79 % | 4 % | 11 % | 64 % | 12 % | 9 % | 346 | ﻊﻣ ﺭﻮﻀﺤﻟﺍ ﻰﻠﻋ ﺐﻇﺍﻮﺗ ﻞﻫ  ﺮﺿﺎﺤﻤﻟﺍ |
| 90 % | 5 % | 10 % | 75 % | 4 % | 7 % | 346 | ﺔﻠﻣﺎﻌﻣ ﻦﺴﺤﻳ ﺮﺿﺎﺤﻤﻟﺍ ﻞﻫ  ﺏﻼﻄﻟﺍ |
| 88 % | 4 % | 9 % | 75 % | 4 % | 8 % | 346 | ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﺪﻋﺎﺴﻳ ﻪﺣﺮﺷ  ﻢﻬﻔﻟﺍ |
| 88 % | 4 % | 10 % | 74 % | 4 % | 8 % | 346 | ﺵﺎﻘﻨﻟﺍ ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﻊﺠﺸﻳ  ﻞﻋﺎﻔﺘﻟﺍﻭ |
| 88 % | 5 % | 9 % | 74 % | 4 % | 8 % | 346 | ﺕﺍﺮﺿﺎﺤﻤﻟﺍ ﺪﻴﻋﺍﻮﻤﺑ ﻡﺰﺘﻠﻳ |
| 89 % | 5 % | 9 % | 75 % | 4 % | 8 % | 346 | ﺕﺎﻳﻮﺘﺤﻣ ﻞﻛ ﺡﺮﺸﺑ ﻡﺰﺘﻠﻳ  ﺭﺮﻘﻤﻟﺍ |
| **ﺕﺎﻘﻴﻠﻌﺘﻟﺍ** | | | | | | | |
| ﺱﺪﻨﻬﻤﻟﺍ ﺍﺬﻫ ﻑﺮﻋﺍ ﻻ | | | | | | | |
| ﺮﺿﺎﺤﻤﻟﺍ ﻑﺮﻋﺍ ﻻ | | | | | | | |
| ﻥﺎﻀﻣﺭ ﺪﻴﺴﻟﺍ ﻥﺎﻀﻣﺭ ﺀﺎﻤﺳﺍ | | | | | | | |
|  | | | | | | | |
| 73 % | 9 % | 11 % | 53 % | 13 % | 13 % | 341 | ﻦﻣ ﻮﻫﻭ ﺮﺿﺎﺤﻤﻟﺍ ﻑﺮﻌﺗ ﻞﻫ  ﻚﻟ ﺭﺮﻘﻤﻟﺍ ﺍﺬﻫ ﺲﻳﺭﺪﺘﺑ ﻡﻮﻘﻳ |
| 83 % | 9 % | 11 % | 63 % | 9 % | 9 % | 341 | ﻊﻣ ﺭﻮﻀﺤﻟﺍ ﻰﻠﻋ ﺐﻇﺍﻮﺗ ﻞﻫ  ﺮﺿﺎﺤﻤﻟﺍ |
| 90 % | 9 % | 10 % | 71 % | 4 % | 6 % | 341 | ﺔﻠﻣﺎﻌﻣ ﻦﺴﺤﻳ ﺮﺿﺎﺤﻤﻟﺍ ﻞﻫ  ﺏﻼﻄﻟﺍ |
| 90 % | 9 % | 11 % | 70 % | 4 % | 6 % | 341 | ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﺪﻋﺎﺴﻳ ﻪﺣﺮﺷ |

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|  |  |  |  |  |  |  | ﻢﻬﻔﻟﺍ |
| 92 % | 9 % | 11 % | 72 % | 3 % | 6 % | 341 | ﺵﺎﻘﻨﻟﺍ ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﻊﺠﺸﻳ  ﻞﻋﺎﻔﺘﻟﺍﻭ |
| 91 % | 9 % | 11 % | 71 % | 4 % | 6 % | 341 | ﺕﺍﺮﺿﺎﺤﻤﻟﺍ ﺪﻴﻋﺍﻮﻤﺑ ﻡﺰﺘﻠﻳ |
| 90 % | 8 % | 12 % | 70 % | 4 % | 6 % | 341 | ﺕﺎﻳﻮﺘﺤﻣ ﻞﻛ ﺡﺮﺸﺑ ﻡﺰﺘﻠﻳ  ﺭﺮﻘﻤﻟﺍ |
| **ﺕﺎﻘﻴﻠﻌﺘﻟﺍ** | | | | | | | |
| ﻯﻭﻼﺒﻋﺰﻟﺍ ﺪﻤﺤﻣ ﻢﻴﻫﺍﺮﺑﺍ ﻢﺻﺎﻋ | | | | | | | |
|  | | | | | | | |
| 75 % | 9 % | 15 % | 51 % | 11 % | 13 % | 341 | ﻦﻣ ﻮﻫﻭ ﺮﺿﺎﺤﻤﻟﺍ ﻑﺮﻌﺗ ﻞﻫ  ﻚﻟ ﺭﺮﻘﻤﻟﺍ ﺍﺬﻫ ﺲﻳﺭﺪﺘﺑ ﻡﻮﻘﻳ |
| 83 % | 9 % | 15 % | 59 % | 7 % | 9 % | 341 | ﻊﻣ ﺭﻮﻀﺤﻟﺍ ﻰﻠﻋ ﺐﻇﺍﻮﺗ ﻞﻫ  ﺮﺿﺎﺤﻤﻟﺍ |
| 89 % | 11 % | 13 % | 65 % | 4 % | 6 % | 341 | ﺔﻠﻣﺎﻌﻣ ﻦﺴﺤﻳ ﺮﺿﺎﺤﻤﻟﺍ ﻞﻫ  ﺏﻼﻄﻟﺍ |
| 90 % | 11 % | 14 % | 65 % | 3 % | 6 % | 341 | ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﺪﻋﺎﺴﻳ ﻪﺣﺮﺷ  ﻢﻬﻔﻟﺍ |
| 89 % | 10 % | 14 % | 65 % | 4 % | 6 % | 341 | ﺵﺎﻘﻨﻟﺍ ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﻊﺠﺸﻳ  ﻞﻋﺎﻔﺘﻟﺍﻭ |
| 91 % | 10 % | 15 % | 66 % | 4 % | 6 % | 341 | ﺕﺍﺮﺿﺎﺤﻤﻟﺍ ﺪﻴﻋﺍﻮﻤﺑ ﻡﺰﺘﻠﻳ |
| 90 % | 9 % | 15 % | 66 % | 4 % | 6 % | 341 | ﺕﺎﻳﻮﺘﺤﻣ ﻞﻛ ﺡﺮﺸﺑ ﻡﺰﺘﻠﻳ  ﺭﺮﻘﻤﻟﺍ |
| **ﺕﺎﻘﻴﻠﻌﺘﻟﺍ** | | | | | | | |
| ﺯﺎﺘﻤﻣ | | | | | | | |

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| ﻯﺩ ﺱﺎﻨﻟﺍ ﺺﻧ ﻑﺮﻋﺍ ﺎﻣ ﷲﺍ ﻭ | | | | | | | |
| ﻒﺳﻮﻳ ﺪﻤﺤﻣ ﻒﺳﻮﻳ ﺪﻟﺎﺧ | | | | | | | |
|  | | | | | | | |
| 70 % | 4 % | 8 % | 58 % | 16 % | 13 % | 344 | ﻦﻣ ﻮﻫﻭ ﺮﺿﺎﺤﻤﻟﺍ ﻑﺮﻌﺗ ﻞﻫ  ﻚﻟ ﺭﺮﻘﻤﻟﺍ ﺍﺬﻫ ﺲﻳﺭﺪﺘﺑ ﻡﻮﻘﻳ |
| 81 % | 4 % | 8 % | 69 % | 10 % | 9 % | 344 | ﻊﻣ ﺭﻮﻀﺤﻟﺍ ﻰﻠﻋ ﺐﻇﺍﻮﺗ ﻞﻫ  ﺮﺿﺎﺤﻤﻟﺍ |
| 90 % | 4 % | 8 % | 78 % | 3 % | 6 % | 344 | ﺔﻠﻣﺎﻌﻣ ﻦﺴﺤﻳ ﺮﺿﺎﺤﻤﻟﺍ ﻞﻫ  ﺏﻼﻄﻟﺍ |
| 90 % | 4 % | 8 % | 78 % | 3 % | 6 % | 344 | ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﺪﻋﺎﺴﻳ ﻪﺣﺮﺷ  ﻢﻬﻔﻟﺍ |
| 90 % | 4 % | 8 % | 78 % | 4 % | 6 % | 344 | ﺵﺎﻘﻨﻟﺍ ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﻊﺠﺸﻳ  ﻞﻋﺎﻔﺘﻟﺍﻭ |
| 90 % | 4 % | 8 % | 78 % | 4 % | 6 % | 344 | ﺕﺍﺮﺿﺎﺤﻤﻟﺍ ﺪﻴﻋﺍﻮﻤﺑ ﻡﺰﺘﻠﻳ |
| 91 % | 4 % | 8 % | 79 % | 3 % | 6 % | 344 | ﺕﺎﻳﻮﺘﺤﻣ ﻞﻛ ﺡﺮﺸﺑ ﻡﺰﺘﻠﻳ  ﺭﺮﻘﻤﻟﺍ |
| **ﺕﺎﻘﻴﻠﻌﺘﻟﺍ** | | | | | | | |
| ﺱﺪﻨﻬﻤﻟﺍ ﺍﺬﻫ ﻑﺮﻋﺍ ﻻ | | | | | | | |
| ﻰﻔﻄﺼﻣ ﻖﻟﺎﺨﻟﺍ ﺪﺒﻋ ﻰﺤﺘﻓ ﻰﻔﻄﺼﻣ | | | | | | | |
|  | | | | | | | |
| 92 % | 29 % | 52 % | 11 % | 1 % | 7 % | 340 | ﻦﻣ ﻮﻫﻭ ﺮﺿﺎﺤﻤﻟﺍ ﻑﺮﻌﺗ ﻞﻫ  ﻚﻟ ﺭﺮﻘﻤﻟﺍ ﺍﺬﻫ ﺲﻳﺭﺪﺘﺑ ﻡﻮﻘﻳ |
| 80 % | 19 % | 49 % | 12 % | 10 % | 9 % | 340 | ﻊﻣ ﺭﻮﻀﺤﻟﺍ ﻰﻠﻋ ﺐﻇﺍﻮﺗ ﻞﻫ  ﺮﺿﺎﺤﻤﻟﺍ |

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| 77 % | 12 % | 40 % | 25 % | 10 % | 14 % | 340 | ﺔﻠﻣﺎﻌﻣ ﻦﺴﺤﻳ ﺮﺿﺎﺤﻤﻟﺍ ﻞﻫ  ﺏﻼﻄﻟﺍ |
| 58 % | 7 % | 29 % | 22 % | 21 % | 21 % | 340 | ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﺪﻋﺎﺴﻳ ﻪﺣﺮﺷ  ﻢﻬﻔﻟﺍ |
| 67 % | 9 % | 36 % | 22 % | 17 % | 16 % | 340 | ﺵﺎﻘﻨﻟﺍ ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﻊﺠﺸﻳ  ﻞﻋﺎﻔﺘﻟﺍﻭ |
| 61 % | 9 % | 32 % | 20 % | 17 % | 22 % | 340 | ﺕﺍﺮﺿﺎﺤﻤﻟﺍ ﺪﻴﻋﺍﻮﻤﺑ ﻡﺰﺘﻠﻳ |
| 77 % | 12 % | 43 % | 22 % | 10 % | 13 % | 340 | ﺕﺎﻳﻮﺘﺤﻣ ﻞﻛ ﺡﺮﺸﺑ ﻡﺰﺘﻠﻳ  ﺭﺮﻘﻤﻟﺍ |
| **ﺕﺎﻘﻴﻠﻌﺘﻟﺍ** | | | | | | | |
| ﺐﻟﺎﻄﻠﻟ ﺔﺤﺿﺍﻭ ﻪﺘﻠﺌﺳﺍﻭ ﻩﺭﺎﻜﻓﺍ ﻦﻜﺗ ﻢﻟ ﻲﺳﺍﺭﺪﻟﺍ ﻞﺼﻔﻟﺍ ﺔﻳﺎﻬﻧ ﺭﺎﺒﺘﺧﺍ | | | | | | | |
| ﻢﻬﻔﻳﻮﺨﺗﻭ ﺏﻼﻄﻟﺍ ﺐﻴﻫﺮﺗ ﻦﻣ ﻻﺪﺑ ﺓﺮﺿﺎﺤﻤﻟﺍ ﻩؤﺎﻘﻟﺍ ﺔﻘﻳﺮﻃ ﻦﺴﺤﻳ ﻥﺍ ﻰﻔﻄﺼﻣ ﺭﻮﺘﻛﺪﻟﺍ ﻦﻣ ﻮﺟﺭﺍ  ﻪﺣﺮﺷ ﺔﻘﻳﺮﻃ ﻦﻣ ﺎﻤﻧﺍﻭ ﺓﺩﺎﻤﻟﺍ ﻦﻣ ﺲﻴﻟ | | | | | | | |
| ﺔﺘﺋﺎﻔﻟﺍ ﺔﻨﺴﻟﺍ ﺭﺮﻘﻣ ﻦﻣ ﻦﻴﻔﻌﺿ ﺮﺒﻛﺍ ﻥﻮﻜﻳ ﺔﻨﺴﻟﺍ ﻩﺬﻫ ﺭﺮﻘﻣ ﻱﺍﺯﺍ | | | | | | | |
| ﻖﻴﻨﺧ ﻥﻮﻜﻳ ﺩﺎﻜﻳﻭ ﻖﻴﺿ ﺪﺣ ﻲﻓ ﻲﻠﻟﺍ ﺔﺸﻗﺎﻨﻤﻟﺍ ﺏﺎﺑ ﺢﺘﻓ ﺪﻨﻋﻭ ﺐﻳﺮﻏ ﺔﻴﻤﻜﺑ ﺞﻬﻨﻤﻟﺍ ﻲﻓ ﺪﻴﻘﻌﺘﻟﺍ ﻲﻬﺘﻨﻣ | | | | | | | |
| ﺓﺮﺿﺎﺤﻤﻟﺎﺑ ﺰﻴﻛﺮﺘﻟﺍ ﻦﻋ ﺎﻨﻠﻐﺸﻳ ﺍﺬﻫ ﻭ ﺕﺎﻤﻠﻛ ﺓﺪﻌﻟ ﺍﺮﻴﺜﻛ ﻩﺭﺍﺮﻜﺗ ﻲﻫ ﻭ ﺽﺮﻌﻟﺎﺑ ﺔﻠﻜﺸﻣ ﻪﻳﺪﻟ | | | | | | | |
| ﺮﺧﺍ ﻲﻓ ﺞﻬﻨﻤﻟﺍ ﻂﻐﻀﻳ ﻢﺛ ﻡﺮﺘﻟﺍ ﻝﻭﺍ ﺕﺍﺮﺿﺎﺤﻣ ﻊﻴﻀﻳ ﺎﻀﻳﺍﻭ ﺐﺗﺮﻣ ﺮﻴﻏ ﻪﺣﺮﺷﻭ ﺮﺧﺎﺘﻣ ﻲﺗﺎﻳ  ﺙﻼﺛ ﻭﺍ ﻦﻴﺗﺮﺿﺎﺤﻣ | | | | | | | |
| ﺾﻣﺎﻏﻭ ﺪﻴﺟ ﺮﻴﻏ ﺭﻮﺘﻛﺩ | | | | | | | |
| ﺩﻮﻌﺴﻟﺍ ﻮﺑﺍ ﻱﺩﺎﻬﻟﺍ ﺪﺒﻋ ﺩﻮﻌﺴﻟﺍ ﻮﺑﺍ ﺪﻴﻟﻭ | | | | | | | |
|  | | | | | | | |
| 90 % | 21 % | 51 % | 18 % | 4 % | 6 % | 339 | ﻦﻣ ﻮﻫﻭ ﺮﺿﺎﺤﻤﻟﺍ ﻑﺮﻌﺗ ﻞﻫ  ﻚﻟ ﺭﺮﻘﻤﻟﺍ ﺍﺬﻫ ﺲﻳﺭﺪﺘﺑ ﻡﻮﻘﻳ |
| 84 % | 15 % | 43 % | 26 % | 8 % | 8 % | 339 | ﻊﻣ ﺭﻮﻀﺤﻟﺍ ﻰﻠﻋ ﺐﻇﺍﻮﺗ ﻞﻫ |

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|  |  |  |  |  |  |  | ﺮﺿﺎﺤﻤﻟﺍ |
| 80 % | 10 % | 40 % | 30 % | 10 % | 9 % | 339 | ﺔﻠﻣﺎﻌﻣ ﻦﺴﺤﻳ ﺮﺿﺎﺤﻤﻟﺍ ﻞﻫ  ﺏﻼﻄﻟﺍ |
| 73 % | 7 % | 32 % | 34 % | 15 % | 11 % | 339 | ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﺪﻋﺎﺴﻳ ﻪﺣﺮﺷ  ﻢﻬﻔﻟﺍ |
| 75 % | 7 % | 33 % | 35 % | 13 % | 12 % | 339 | ﺵﺎﻘﻨﻟﺍ ﻰﻠﻋ ﺏﻼﻄﻟﺍ ﻊﺠﺸﻳ  ﻞﻋﺎﻔﺘﻟﺍﻭ |
| 89 % | 14 % | 47 % | 28 % | 4 % | 7 % | 339 | ﺕﺍﺮﺿﺎﺤﻤﻟﺍ ﺪﻴﻋﺍﻮﻤﺑ ﻡﺰﺘﻠﻳ |
| 87 % | 11 % | 42 % | 34 % | 5 % | 8 % | 339 | ﺕﺎﻳﻮﺘﺤﻣ ﻞﻛ ﺡﺮﺸﺑ ﻡﺰﺘﻠﻳ  ﺭﺮﻘﻤﻟﺍ |
| **ﺕﺎﻘﻴﻠﻌﺘﻟﺍ** | | | | | | | |
| ﺎﻧﺎﻌﻣ ﺙﺪﺤﻳ ﺎﻣ ﺍﺬﻫﻭ ﺎﻬﺴﻳﺭﺪﺘﺑ ﺭﻮﺘﻛﺩ ﻦﻣ ﺮﺜﻛﺍ ﻡﻮﻘﻳ ﻥﺍ ﺢﺼﻳ ﻻ ﻮﻣﺮﺜﻟﺍ ﺓﺩﺎﻣ ﻥﺍ ﻰﻳﺍﺭ ﻦﻣ | | | | | | | |
| ﺓﺮﻤﻟﺎﺑ ﺔﻴﻓﺎﻛ ﺮﻴﻏ ﺔﻣﻮﻠﻌﻤﻟﺍ ﻞﻴﺻﻮﺗ ﻲﻠﻋ ﺔﺗﺭﺪﻗ ﻻﻭ ﻢﻴﻈﻋ ﺭﻮﺘﻛﺩ ﻥﻮﻜﻴﻟ ﻲﻔﻜﺗ ﺕﺎﻣﻮﻠﻌﻣ ﻪﻳﺪﻟ ﻮﻫ | | | | | | | |

# Comments from external evaluator(s)

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| --- | --- |
| **Comments** | **Response of Course team** |
| - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - - |
| - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - - |
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| - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - - |
| - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - - |
| - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - - |
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# Course enhancement:

**Progress on actions identified in the previous year's action plane:**

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| **Action** | **State whether or not completed and give reasons for any non-completion** |
| N/A - - - - - - - - - - - - - - - - - - - - - -  - **- - - - - - - - - - - - - - - - - - - - - - - - -**  **- - - - - - - - - - - - - - - - - - - - - - - - - -** | - - - - - - - - - - - - - - - - - - - - - - - **- - - -**  **- - - - - - - - - - - - - - - - - - - - - - - - - - -**  **- - - - - - - - - - - - - - - - - - - - - - - - - - -** |

* 1. **Action plan for academic year 2016-2017**

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| **Actions required** | **Completion date** | **Person responsible** |
| - - - - - - - - - - - - - - - - - - **- -**  **- - - - - - - - - - - - - - - - -** | - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - |

**Course Content/ILO Matrix**

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| Course Content | a1 | a2 | a3 | a4 | a5 | a6 | b1 | b2 | b3 | c1 | c2 | d1 | d2 | d3 |
| Introduction and basic concepts |  |  | • |  |  |  |  | • |  |  |  |  |  |  |
| Energy, energy transfer and energy analysis |  | • |  |  |  |  | • |  |  |  |  |  |  |  |
| First law of thermodynamics | • |  |  |  |  |  | • |  | • |  | • |  | • |  |
| Properties of pure substances: phase change,  property diagrams, property tables, EES  software and the ideal-gas equation of state |  |  |  | • |  | • |  | • |  | • | • | • |  |  |
| Energy analysis of closed systems: energy  balance, | • | • | • |  | • |  | • | • | • | • | • |  |  |  |
| Mass and energy analysis of control volumes:  conservation of mass, flow work, energy analysis of steady-flow systems | • | • | • |  | • |  | • | • | • | • | • | • |  |  |
| Thermodynamics’ applications | • | • | • | • | • | • | • | • | • | • | • |  | • |  |
| Simple-ideal power cycles | • | • | • | • | • | • | • | • | • | • |  | • |  |  |

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