**Annual Course Report of**

**Fluid Mechanics - MEP 231 - Fall 2015**

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

**A- Basic Information**

1. **Title and code:**

“Fluid Mechanics” - MEP 231

2. **Programme on which the course is given:**

Mechanical Power Engineering

3. **Year / Level of programme(s)** Undergraduate B.Sc. 2nd year - Fall 2015

1. **Units / Credit Hours:**

|  |  |  |
| --- | --- | --- |
| i. | Lecture: | 4 |
| ii. | Tutorial : | 2 |
| iii. | Practical: | 1 |
| iv. | Total: | 7 |

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

i. Dr. Yaser Fangary ii.

iii.

**Course coordinator:** Dr. Nabil Abd ElAziz

**External evaluator:** Prof. Salah El-Haggar

**B- Statistical Information**

No of students attending the course: 193

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **Number** | **Percentage (%)** |
| **Students completing the course** | | 193 | 100 % |
| **Results** | Passed | 179 | 92.75 % |
| Failed | 14 | 7.25 % |
| **Grading of successful students** | Excellent | 22 | 11.4 % |
| Very Good | 20 | 10.4 % |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Good | 49 | 25.4 % |
| Fair | 88 | 45.6 % |

**C- Professional Information**

**1. Course Teaching:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Course Content** | **Lecture**  **(hours)** | **Tutorial**  **(hours)** | **Total**  **(hours)** | **Lecturer** |
| 1 | Cavitation in pumps and turbines | 4 | 2 | 6 | Dr. Yaser Fangary |
| 2 | Water hammer phenomena in  pipelines | 4 | 2 | 6 |
| 3 | Hydraulic turbines | 4 | 3 | 7 |
| 4 | Pelton turbines | 6 | 3 | 9 |
| 5 | Francis and Kaplan turbines | 6 | 3 | 9 |
| 6 | Hydropower in Egypt | 4 | 3 | 7 |
| 7 | Pumping system fundamentals | 2 | 3 | 5 |
| 8 | Theory and applications of centrifugal  pumps | 2 | 2 | 4 |
| 9 | Classification and selection of pumps | 2 | 2 | 4 |
| 10 | Design and construction of  centrifugal pumps | 2 | 3 | 5 |
| 11 | Centrifugal pump performance | 2 | 3 | 5 |
| 12 | Dynamic similarity and Specific  speed of pumps | 3 | 2 | 5 |
| 13 | Operation of Centrifugal pump | 3 | 3 | 6 |
| 14 | Pumps arrangements, series and  parallel connections | 3 | 3 | 6 |
| 15 | Cavitation in centrifugal pumps and  Net Positive Suction Head (NPSH) | 2 | 3 | 5 |
| 16 | Axial and radial thrust in centrifugal  pumps | 3 | 2 | 5 |
| 17 | Reciprocating Positive displacement  pumps | 2 | 2 | 4 |
| 18 | Rotary Positive displacement pumps | 2 | 5 | 7 |
|  | Total | 56 | 49 | 1055 |  |

**Laboratory Activities**

**Experiments for Fluid Mechanics (MEP 231)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Weeks** | **Date** | | **Experiment** |
| **From** | **To** |
| **1** | 28/9 | 1/10 | To Introduce lab experiments and practice essential  measurements and Lab Safety |

|  |  |  |  |
| --- | --- | --- | --- |
| **2** | 4/10 | 8/10 | Introduction to Turbomachinery |
| **3** | 11/10 | 15/10 | Introduction to Turbomachinery |
| **4** | 18/10 | 22/10 | Water Hammer |
| **5** | 25/10 | 29/10 | Water Hammer |
| **6** | 1/11 | 5/11 | Pelton wheel Test |
| **7** | 8/11 | 12/11 | Pelton wheel Test |
| **8** | 15/11 | 19/11 | Mid-Term Exam |
| **9** | 22/11 | 26/11 | Centrifugal Pump Performance |
| **10** | 29/11 | 3/12 | Centrifugal Pump Performance |
| **11** | 6/12 | 10/12 | Series & Parallel Pump Operation |
| **12** | 13/12 | 17/12 | Series & Parallel Pump Operation |
| **13** | 20/12 | 24/12 | Francis Turbine Test |
| **14** | 27/12 | 2/1 | Francis Turbine Test |
| **15** | 3/1 | | Francis Turbine Test |

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

ʘ > 90% 70% - 90% < 70%

**Reasons in details for not teaching any topic:**

N/A - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

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

N/A - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

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**2. 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 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

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**3. Student assessment:**

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| --- | --- | --- |
| **Method of assessment** | **Marks** | **Percentage of total** |
| Written examination | 90 | 60 % |
| Oral examination | 30 | 20 % |
| Written midterm exam | 20 | 13.33 % |
| Practical /Laboratory work | 5 | 3.33 % |
| Other assessment / class work | 5 | 3.33 % |
| Total | 150 | 100% |

**Members of examination committee:**

Dr. Yaser Fangary

**Role of the external evaluator**

To express his views on the course - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

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**4. Facilities and teaching materials:**

Totally adequate

Adequate to some extent

Inadequate

**List any inadequacies**

Laboratory test equipment require repair and maintenance for the Pelton wheel test rig to get it running efficiently,

**5.Administrative constraints**

List any difficulties encountered

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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**6. Student evaluation of the course:**

|  |  |
| --- | --- |
| **Comments** | **Response of Course team** |
| - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - |
| - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - |
| - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - |
| - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - |

**7. Comments from external evaluator(s)**

|  |  |
| --- | --- |
| **Comments** | **Response of Course team** |
| - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - |
| - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - |
| - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - |
| - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - - - - - - - - - - |

**8. Course enhancement:**

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

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

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

|  |  |  |
| --- | --- | --- |
| Actions required | Completion date | Person responsible |
| Furnishing required laboratory items | - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - -  - - - - - - - - - - - - - - - - - - |

**Course Content/ILO Matrix**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course Content | a1 | a2 | a3 | a4 | a5 | a6 | a7 | b1 | b2 | b3 | c1 | c2 | c3 | d1 | d2 | d3 |
| Cavitation in pumps and turbines | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |  |  |  |  |  |
| Water hammer phenomena in pipelines | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |  |  |  |  |  |
| Hydraulic turbines | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Pelton turbines | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Francis and Kaplan turbines | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hydropower in Egypt | ● | ● | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |  |  |  |
| Pumping system fundamentals | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |  |  |  |  |  |
| Theory and applications of centrifugal  pumps | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |  |  |  |
| Classification and selection of pumps | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |  |  |
| Design and construction of centrifugal  pumps | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Centrifugal pump performance | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Dynamic similarity and Specific speed of  pumps | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |  |  |
| Operation of Centrifugal pump | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Pumps arrangements, series and parallel  connections | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |  |  |  |
| Cavitation in centrifugal pumps and Net  Positive Suction Head (NPSH) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |  |  |
| Axial and radial thrust in centrifugal pumps | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |  |  |  |
| Reciprocating Positive displacement pumps | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |  |  |
| Rotary Positive displacement pumps | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |  |  |