ADAMAS UNIVERSITY

PURSUE EXCELLENCE

KOLKATA

# ADAMAS UNIVERSITY

## SCHOOL OF ENGINEERING & TECHNOLOGY

### Department of Civil Engineering

# M.Tech. Environmental Engineering Program

# Course File (Theory)

**Course Name: Air and Noise Pollution**

**Course Code: ENV21004**

**Course Coordinator: Mr. Jayanta Nath Chowdhury**

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
8. **Program : M.Tech (Environmental Engineering)** **T: 1**
9. **Target : 60%** **P: 0**
**C: 4**

# THEORY COURSE FILE CONTENTS

**Check list Course Outcomes Attainment**

| S. No. | Contents | Available (Y/N/NA) | Date of Submission | Signature of HOD |
|---|---|---|---|---|
| 1. | Authenticated Syllabus Copy | Y | | |
| 2. | Individual Time Table | Y | | |
| 3. | Students' Name List (Approved Copy) | Y | | |
| 4. | Course Plan, PO, PSO, COs, CO-PO Mapping, COA Plan, Session Plan and Periodic Monitoring | Y | | |
| 5. | Previous Year End Semester Question Papers | Y | | |
| 6. | Question Bank (All Units - Part A, Part B & C) | Y | | |
| 7. | Dissemination of Syllabus and Course Plan to Students | Y | | |
| 8. | Lecture Notes - Unit I, II & III | Y | 01.09.2020 | |
| 9. | **Sample Documents and Evaluation Sheet for Internal Assessment** – Tutorials / Assignments / Class Test / Open Book Test / Quiz / Project / Seminar / Role Playif any (Before Mid Term) | Y | | |
| 10. | **Mid Term Examination**<br>A. Question Paper / Any Other Assessment Tools Used<br>B. Sample Answer Scripts (Best, Average,Poor) if required<br>C. Evaluation Sheet<br>D. Slow Learners List and Remedial Measures | Y | 18.01.2021 | |
| 11. | Lecture Notes – Unit IV & V | Y | | |
| 12. | **Sample Documents and Evaluation Sheet for Internal Assessment**– Tutorials / Assignments / Class Test /Open Book Test / Quiz / Project / Seminar / Role Play if any (After Mid Term) | Y | | |
| 13. | Course End Survey (Indirect Assessment)& Consolidation | Y | | |
| 14. | **End Term Examination**<br>A. Question Paper & Answer Key<br>B. Sample Answer Scripts (Best, Average,Poor) if required | Y | 26.03.2021 | |

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
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| | | | | |
|---|---|---|---|---|
| | C. Evaluation Sheet<br>**D.** Slow Learners List and RemedialMeasures. | | | |
| 15. | Content Beyond the Syllabus (Proof) | Y | | |
| 16. | Innovative Teaching Tools Used for TLP | Y | | |
| 17. | Details of Visiting Faculty Session / Industry Expert/ Guest Lecture / Seminar / Field Visit / Webinars / Flipped Class Room / Blended Learning / Online Resources etc. | Y | | |
| 18. | Consolidated Mark Statement | Y | | |
| 19. | CO Attainment (Mid Term + Internal Assessment + End Term) | Y | After Result Declaration (07.04.2021) | |
| 20. | Gap Analysis & Remedial Measures | Y | | |
| 21. | CO - PO Attainment | Y | | |
| 22. | Class Record (Faculty Logbook) | Y | | |

**Signature of HOD/ Dean** **Signature of Faculty**

**Date:** **Date:**

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
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**C: 4**

# Syllabus Copy

| | | | | | |
|---|---|---|---|---|---|
| **ECE61107** | **Air and Noise Pollution** | L | T | P | C |
| **Version 1.0** | | 3 | 1 | 0 | 4 |
| **Pre-requisites/Exposure** | | | | | |
| **Co-requisites** | Air & Noise Pollution Lab (ECE61203) | | | | |

## Course Objectives

To comprehend the essential concepts of Air and Noise pollution.

## Course Content

**Module 1** **Lecture Hr. 12 + Tutorial Hr. 5**

Environment Pollution, Pollution control. Concept of unpolluted air, Gaseous and vapour pollutants in atmosphere, Scales of air pollution, Primary and secondary pollutants, Ambient Air Quality, Monitoring for pollutants (SO2, NO2, O3, PAN, Particulates, Hydrocarbons, PAH's) and their health effects.

**Module 2** **Lecture Hr. 15 + Tutorial Hr. 5**

Self-cleansing properties of the environment; Dilution method; Engineered Control of Air Pollutants: Control of the particulates, Control of Gaseous Pollutants, Control of Air pollution from Automobiles.

**Module 3** **Lecture Hr. 18 + Tutorial Hr. 5**

Noise Pollution: Definition; Sound Pressure, Power and Intensity; Noise Measurement: Relationships among Pressure, Power and Intensity, Levels, Frequency Band, Decibel Addition, Measures of community Noise i.e. LN, Leq, Ldn,, LNP; Sources, ; Effects; Control.

Stack monitoring for thermal power plant, Oil refinery industry, Fertilizer industry, Non ferrous metal industry. Recent techniques of online stack monitoring, Emission inventory. Trends of AAQ in Urban, Rural and Industrial areas.

**Text Books:**


1. Santosh Kumar Garg , Sewage Disposal and Air Pollution Engineering, Environmental Engineering (Vol.II), Khanna Publishers,2013
2. S.V.S. Rana, Essentials of Ecology and Environmental Science ,Fourth Edition , 2010
3. Arthur C. Stern Fundamentals of air pollution 2nd edition, Elsevier, 1984
4. Murphy, E., King,E., Environmental Noise Pollution, Elsevier, 2014
5. Liptak, B G, Instrument Engineers Hand Book (Vol. I & II), Chilton Book Company, Philadelphia,4th ed., 2005


**Reference Books:**


1. Santosh Kumar Garg , Water Supply Engineering, Environmental Engineering (Vol.I), Khanna Publishers, 2014
2. De Nevers, N., Air Pollution Control Engineering, 3rd edition Waveland Press Inc 2016

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** — **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** — **L: 3**
8. **Program : M.Tech (Environmental Engineering)** — **T: 1**
9. **Target : 60%** — **P: 0**, **C: 4**

# Faculty Individual Time Table

**ADAMAS UNIVERSITY, KOLKATA**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF CIVIL ENGINEERING**

**M. Tech (Environmental Engineering)**

**Course Code & Course: ECE61107 & Air and Noise Pollution**

**Faculty Coordinator: Jayanta Nath Chowdhury**

| Day & Time | 10.30 - 11.20 | 11.20 - 12.10 | 12.10 - 01.00 | 01.00 - 01.50 | 01.50 - 02.40 | 02.40 - 03.30 | 03.30 - 04.20 | 04.20 - 05.10 |
|---|---|---|---|---|---|---|---|---|
| Monday | | | | LUNCH | Air and Noise Pollution (J.N.C) | | | |
| Tuesday | | | | | | | | |
| Wednesday | | | | | | | | |
| Thursday | | Air and Noise Pollution (J.N.C) | | | | | | |
| Friday | | | | | | | | |

**Signature of HOD**

**Date: 01.09.2020**

**Signature of Class Coordinator**

**Date: 01.09.2020**

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
8. **Program : M.Tech (Environmental Engineering)** **T: 1**
9. **Target : 60%** **P: 0**

**C: 4**

# Students Name List

| Roll Number | Registration Number | Name of the Student |
|---|---|---|
| PG/02/MTEVE/2020/001 | AU/2020/0004291 | SNEHASHIS GHOSH |
| PG/02/MTEVE/2020/002 | AU/2020/0004450 | SRIJA SINHAROY |
| PG/02/MTEVE/2020/003 | AU/2020/0004454 | SUMIT KUMAR KHAN |
| PG/02/MTEVE/2020/004 | AU/2020/0004460 | SUSMITA PANDIT |

**Signature of HOD/Dean**

**Date: 01.09.2020**

**Signature of Class Coordinator**

**Date: 01.09.2020**

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
8. **Program : M.Tech (Environmental Engineering)** **T: 1**
9. **Target : 60%** **P: 0**

**C: 4**

# COURSE PLAN

| | |
|---|---|
| Target | 60% (marks) |
| Level-1 | 50% (population) |
| Level-2 | 60% (population) |
| Level-3 | 70% (population) |

## 1. Method of Evaluation

| **UG** | **PG** |
|---|---|
| Internal Assessment (30%)<br>(Quizzes/Tests, Assignments & Seminars etc.) | Internal Assessment (30%)<br>(Quizzes/Tests, Assignments & Seminars etc.) |
| Mid Semester Examination (20%) | Mid Semester Examination (20%) |
| End Semester Examination (50%) | End Semester Examination (50%) |

*Keep as per Program (UG/PG)

## 2. Passing Criteria

| **Scale** | **PG** | **UG** |
|---|---|---|
| **Out of 10 Point Scale** | CGPA – "5.00"<br>Min. Individual Course Grade – "C"<br>Passing Minimum – 40 | CGPA – "5.00"<br>Min. Individual Course Grade – "C"<br>Passing Minimum – 35 |

*Keep as per Program (UG/PG)

## 3. Pedagogy

- **Direct Instruction**
- Kinesthetic Learning
- **Flipped Classroom**
- Differentiated Instruction
- Expeditionary Learning
- Inquiry Based Learning
- Game Based Learning
- Personalized Learning

## 4. Topics introduced for the first time in the program through this course

- (New Topic – Content Beyond Syllabus – Acid Rain, Ozone Depletion, Global warming)

## 5. References:

| Text Books | Web Resources | Journals | Reference Books |
|---|---|---|---|
| 5 | 3 | | 2 |

**Signature of HOD/Dean** **Signature of Faculty**

**Date: 01.09.2020** **Date: 01.09.2020**

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
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**C: 4**

# GUIDELINES TO STUDY THE SUBJECT

**Instructions to Students:**

1. Go through the 'Syllabus' in the LMS in order to find out the Reading List.
2. Get your schedule and try to pace your studies as close to the timeline as possible.
3. Get your on-line lecture notes (Content, videos) at Lecture Notes section. These are our lecture notes. Make sure you use them during this course.
4. check your LMS regularly
5. go through study material
6. check mails and announcements on blackboard
7. keep updated with the posts, assignments and examinations which shall be conducted on the blackboard
8. Be regular, so that you do not suffer in any way
9. **Cell Phones and other Electronic Communication Devices:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) are not permitted in classes during Tests or the Mid/Final Examination. Such devices MUST be turned off in the class room.
10. **E-Mail and online learning tool:** Each student in the class should have an e-mail id and a pass word to access the LMS system regularly. Regularly, important information – Date of conducting class tests, guest lectures, via online learning tool. The best way to arrange meetings with us or ask specific questions is by email and prior appointment. All the assignments preferably should be uploaded on online learning tool. Various research papers/reference material will be mailed/uploaded on online learning platform time to time.
11. **Attendance:** Students are required to have minimum attendance of 75% in each subject. Students with less than said percentage shall NOT be allowed to appear in the end semester examination.

This much should be enough to get you organized and on your way to having a great semester! If you need us for anything, send your feedback through e-mail jayantanath.chowdhury@adamasuniversity.ac.in Please use an appropriate subject line to indicate your message details.

There will no doubt be many more activities in the coming weeks. So, to keep up to date with all the latest developments, please keep visiting this website regularly.

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
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**C: 4**

# RELATED OUTCOMES

**1. The expected outcomes of the Program are:**

| | |
|---|---|
| PO1 | **Domain Knowledge:** Apply comprehensive knowledge of principles and concepts for Air and Noise pollution. |
| PO2 | **Analysis and Design:** Identify and analyze the strategic methodology of Air and Noise pollution and its proper management using mathematical and engineering principles. |
| PO3 | **Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including test results, analysis and interpretation of data, and synthesis of the information to provide valid conclusions realted to Air and Noise pollution. |
| PO4 | **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern simulation tools for understanding and managing Air and Noise pollution. |
| PO5 | **Environment and sustainability:** Understand the need to maintain environmental balance to achieve sustainable future with all the necessary requirements and to control Environmental pollution. |
| PO6 | **Ethics:** Understand the impact of environmental pollution in societal, ethical and personal contexts, and demonstrate the knowledge. |
| PO7 | **Individual or team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. |
| PO8 | **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and moreover to give and receive clear instructions. |
| PO9 | **Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. |

**2. The expected outcomes of the Specific Program are: (upto 3)**

| | |
|---|---|
| PSO1 | PG itself a Specific Programme. Henceforth no PSO is Required. |
| PSO2 | |
| PSO3 | |

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
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**C: 4**

3. **The expected outcomes of the Course are: (minimum 4 and maximum 6)**

| | |
|---|---|
| CO1 | Explain basic principles on various aspects of atmospheric chemistry. |
| CO2 | Identify the major sources, effects and monitoring of air and noise pollutants. |
| CO3 | Infer the key transformations and meteorological influence on air and noise. |
| CO4 | Analyze the pollution regulation on its scientific basis. |

**4. Co-Relationship Matrix**

Indicate the relationships by1- Slight (Low) 2- Moderate (Medium) 3-Substantial (High)

| Program Outcomes / Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 |
|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | - | - | - | 2 | - | 1 | - | 2 |
| **CO2** | 3 | - | - | 2 | 2 | - | 1 | - | 2 |
| **CO3** | 3 | 2 | 2 | 2 | - | - | - | - | 2 |
| **CO4** | - | 2 | 2 | 2 | - | 2 | - | 1 | - |
| **Average** | **3** | **2** | **2** | **2** | **2** | **2** | **1** | **1** | **2** |

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
8. **Program : M.Tech (Environmental Engineering)** **T: 1**
9. **Target : 60%** **P: 0**

**C: 4**

## 5. Course Outcomes Assessment Plan (COA):

| Course Outcomes | Internal Assessment* (30 Marks) | | Mid Term Exam (20 Marks) | End Term Exam (50 Marks) | Total (100 Marks) |
|---|---|---|---|---|---|
| | Before Mid Term | After Mid Term | | | |
| CO1 | 5 | NA | 10 | 10 | 25 |
| CO2 | 5 | 3 | 10 | 17 | 35 |
| CO3 | NA | 13 | NA | 10 | 23 |
| CO4 | NA | 4 | NA | 13 | 17 |
| Total | 10 | 20 | 20 | 50 | 100 |

* Internal Assessment – Tools Used: Class Test.

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
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9. **Target : 60%** **P: 0**

**C: 4**

# OVERVIEW OF COURSE PLAN OF COURSE COVERAGE

**Course Activities:**

| S. No. | Description | Planned | | | Actual | | | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | From | To | No. of Session | From | To | No. of Session | |
| **1.** | **Environment Pollution** | 03.09.2020 | 12.10.2020 | 17 | 03.09.2020 | 12.10.2020 | 17 | Completed as per Plan |
| **2.** | **Self-cleansing properties of the environment** | 12.10.2020 | 10.12.2020 | 20 | 12.10.2020 | 10.12.2020 | 20 | Completed as per Plan |
| **3.** | **Noise Pollution** | 10.12.2020 | 15.02.2021 | 23 | 10.12.2020 | 15.02.2021 | 23 | Completed as per Plan |

Total No. of Instructional periods available for the course: 60 Sessions (45 lecture hours + 15 Tutorial hours)

**Signature of HOD/Dean**

**Date: 15.02.2021**

**Signature of Faculty**

**Date: 15.02.2021**

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
8. **Program : M.Tech (Environmental Engineering)** **T: 1**
9. **Target : 60%** **P: 0**

**C: 4**

# SESSION PLAN

| Session Plan | | | | Actual Delivery | | | |
|---|---|---|---|---|---|---|---|
| Lect. | Date | Topics to be Covered | CO Mapped | Lect. | Date | Topics Covered | CO Achieved |
| 1 | 03.09.2020 | Environment Pollution | CO1 | 1 | 03.09.2020 | Environment Pollution | CO1 |
| 2 | 03.09.2020 | Pollution control (1 tutorial hour) | CO1 | 2 | 03.09.2020 | Pollution control (1 tutorial hour) | CO1 |
| 3 | 07.09.2020 | | CO1 | 3 | 07.09.2020 | | CO1 |
| 4 | 07.09.2020 | | CO1 | 4 | 07.09.2020 | | CO1 |
| 5 | 10.09.2020 | Concept of unpolluted air | CO1 | 5 | 10.09.2020 | Concept of unpolluted air | CO1 |
| 6 | 10.09.2020 | Gaseous and vapour pollutants in atmosphere (1 tutorial hour) | CO1 | 6 | 10.09.2020 | Gaseous and vapour pollutants in atmosphere (1 tutorial hour) | CO1 |
| 7 | 17.09.2020 | | CO1 | 7 | 17.09.2020 | | CO1 |
| 8 | 17.09.2020 | Scales of air pollution | CO1 | 8 | 17.09.2020 | Scales of air pollution | CO1 |
| 9 | 21.09.2020 | Primary and secondary pollutants | CO1 | 9 | 21.09.2020 | Primary and secondary pollutants | CO1 |
| 10 | 21.09.2020 | | CO1 | 10 | 21.09.2020 | | CO1 |
| 11 | 28.09.2020 | Ambient Air Quality (1 tutorial hour) | CO1 | 11 | 28.09.2020 | Ambient Air Quality (1 tutorial hour) | CO1 |
| 12 | 28.09.2020 | | CO1 | 12 | 28.09.2020 | | CO1 |

**UNIT-I**

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
8. **Program : M.Tech (Environmental Engineering)** **T: 1**
9. **Target : 60%** **P: 0**

**C: 4**

| Session Plan | | | | Actual Delivery | | | |
|---|---|---|---|---|---|---|---|
| Lect. | Date | Topics to be Covered | CO Mapped | Lect. | Date | Topics Covered | CO Achieved |
| 13 | 01.10.2020 | Monitoring for pollutants (SO2, NO2, O3, PAN, Particulates, Hydrocarbons, PAH's) and their health effects (2 tutorial hours) | CO1 | 13 | 01.10.2020 | Monitoring for pollutants (SO2, NO2, O3, PAN, Particulates, Hydrocarbons, PAH's) and their health effects (2 tutorial hours) | CO1 |
| 14 | 01.10.2020 | | CO1 | 14 | 01.10.2020 | | CO1 |
| 15 | 05.10.2020 | | CO1 | 15 | 05.10.2020 | | CO1 |
| 16 | 05.10.2020 | | CO1 | 16 | 05.10.2020 | | CO1 |
| 17 | 12.10.2020 | | CO1 | 17 | 12.10.2020 | | CO1 |

**Remarks:** **NA**

**Signature of Faculty**

**Date: 12.10.2020**

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
8. **Program : M.Tech (Environmental Engineering)** **T: 1**
9. **Target : 60%** **P: 0**

**C: 4**

# SESSION PLAN

## UNIT-II

| Session Plan | | | | Actual Delivery | | | |
|---|---|---|---|---|---|---|---|
| Lect. | Date | Topics to be Covered | CO Mapped | Lect. | Date | Topics Covered | CO Achieved |
| 1 | 12.10.2020 | Self-cleansing properties of the environment (1 tutorial hour) | CO2 | 1 | 12.10.2020 | Self-cleansing properties of the environment (1 tutorial hour) | CO2 |
| 2 | 15.10.2020 | | CO2 | 2 | 15.10.2020 | | CO2 |
| 3 | 15.10.2020 | | CO2 | 3 | 15.10.2020 | | CO2 |
| 4 | 19.10.2020 | | CO2 | 4 | 19.10.2020 | | CO2 |
| 5 | 19.10.2020 | | CO2 | 5 | 19.10.2020 | | CO2 |
| 6 | 02.11.2020 | Dilution method (1 tutorial hour) | CO2 | 6 | 02.11.2020 | Dilution method (1 tutorial hour) | CO2 |
| 7 | 02.11.2020 | | CO2 | 7 | 02.11.2020 | | CO2 |
| 8 | 05.11.2020 | | CO2 | 8 | 05.11.2020 | | CO2 |
| 9 | 05.11.2020 | | CO2 | 9 | 05.11.2020 | | CO2 |
| 10 | 12.11.2020 | Engineered Control of Air Pollutants: Control of the particulates (1 tutorial hour) | CO2 | 10 | 12.11.2020 | Engineered Control of Air Pollutants: Control of the particulates (1 tutorial hour) | CO2 |
| 11 | 12.11.2020 | | CO2 | 11 | 12.11.2020 | | CO2 |
| 12 | 19.11.2020 | | CO2 | 12 | 19.11.2020 | | CO2 |

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
8. **Program : M.Tech (Environmental Engineering)** **T: 1**
9. **Target : 60%** **P: 0**

**C: 4**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 13 | 19.11.2020 | | CO2 | 13 | 19.11.2020 | | CO2 |

| Session Plan | | | | Actual Delivery | | | |
|---|---|---|---|---|---|---|---|
| Lect. | Date | Topics to be Covered | CO Mapped | Lect. | Date | Topics Covered | CO Achieved |
| 14 | 26.11.2020 | Engineered Control of Air Pollutants: Control of Gaseous Pollutants (1 tutorial hour) | CO2 | 14 | 26.11.2020 | Engineered Control of Air Pollutants: Control of Gaseous Pollutants (1 tutorial hour) | CO2 |
| 15 | 26.11.2020 | | CO2 | 15 | 26.11.2020 | | CO2 |
| 16 | 03.12.2020 | | CO2 | 16 | 03.12.2020 | | CO2 |
| 17 | 03.12.2020 | | CO2 | 17 | 03.12.2020 | | CO2 |
| 18 | 07.12.2020 | Control of Air pollution from Automobiles (1 tutorial hour) | CO2 | 18 | 07.12.2020 | Control of Air pollution from Automobiles (1 tutorial hour) | CO2 |
| 19 | 07.12.2020 | | CO2 | 19 | 07.12.2020 | | CO2 |
| 20 | 10.12.2020 | | CO2 | 20 | 10.12.2020 | | CO2 |

**Remarks: NA**

**Signature of Faculty**

**Date: 10.12.2020**

# SESSION PLAN
## UNIT-III

| Session Plan | | | | Actual Delivery | | | |
|---|---|---|---|---|---|---|---|
| Lect. | Date | Topics to be Covered | CO Mapped | Lect. | Date | Topics Covered | CO Achieved |
| 1 | 10.12.2020 | Noise Pollution: Definition; Sound Pressure, Power and Intensity (1 tutorial hour) | CO3 | 1 | 10.12.2020 | Noise Pollution: Definition; Sound Pressure, Power and Intensity (1 tutorial hour) | CO3 |
| 2 | 17.12.2020 | | CO3 | 2 | 17.12.2020 | | CO3 |
| 3 | 17.12.2020 | | CO3 | 3 | 17.12.2020 | | CO3 |
| 4 | 21.12.2020 | Noise Measurement: Relationships among Pressure, Power and Intensity, Levels, Frequency Band, Decibel Addition (1 tutorial hour) | CO3 | 4 | 21.12.2020 | Noise Measurement: Relationships among Pressure, Power and Intensity, Levels, Frequency Band, Decibel Addition (1 tutorial hour) | CO3 |
| 5 | 21.12.2020 | | CO3 | 5 | 21.12.2020 | | CO3 |
| 6 | 04.01.2021 | | CO3 | 6 | 04.01.2021 | | CO3 |
| 7 | 04.01.2021 | | CO3 | 7 | 04.01.2021 | | CO3 |
| 8 | 07.01.2021 | Measures of community Noise i.e. LN, Leq, Ldn,, LNP (1 tutorial hour) | CO3 | 8 | 07.01.2021 | Measures of community Noise i.e. LN, Leq, Ldn,, LNP (1 tutorial hour) | CO3 |
| 9 | 07.01.2021 | | CO3 | 9 | 07.01.2021 | | CO3 |
| 10 | 18.01.2021 | | CO3 | 10 | 18.01.2021 | | CO3 |
| 11 | 18.01.2021 | | CO3 | 11 | 18.01.2021 | | CO3 |
| 12 | 21.01.2021 | Sources, ; Effects; Control | CO3 | 12 | 21.01.2021 | Sources, ; Effects; Control | CO3 |

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
8. **Program : M.Tech (Environmental Engineering)** **T: 1**
9. **Target : 60%** **P: 0**

**C: 4**

| Session Plan | | | | Actual Delivery | | | |
|---|---|---|---|---|---|---|---|
| Lect. | Date | Topics to be Covered | CO Mapped | Lect. | Date | Topics Covered | CO Achieved |
| 13 | 21.01.2021 | Stack monitoring for thermal power plant, Oil refinery industry, Fertilizer industry, Non ferrous metal industry (1 tutorial hour) | CO4 | 13 | 21.01.2021 | Stack monitoring for thermal power plant, Oil refinery industry, Fertilizer industry, Non ferrous metal industry (1 tutorial hour) | CO4 |
| 14 | 28.01.2021 | | CO4 | 14 | 28.01.2021 | | CO4 |
| 15 | 28.01.2021 | | CO4 | 15 | 28.01.2021 | | CO4 |
| 16 | 01.02.2021 | | CO4 | 16 | 01.02.2021 | | CO4 |
| 17 | 01.02.2021 | | CO4 | 17 | 01.02.2021 | | CO4 |
| 18 | 04.02.2021 | Recent techniques of online stack monitoring | CO4 | 18 | 04.02.2021 | Recent techniques of online stack monitoring | CO4 |
| 19 | 04.02.2021 | | CO4 | 19 | 04.02.2021 | | CO4 |
| 20 | 11.02.2021 | Emission inventory (1 tutorial hour) | CO4 | 20 | 11.02.2021 | Emission inventory (1 tutorial hour) | CO4 |
| 21 | 11.02.2021 | | CO4 | 21 | 11.02.2021 | | CO4 |
| 22 | 15.02.2021 | Trends of AAQ in Urban, Rural and Industrial areas | CO4 | 22 | 15.02.2021 | Trends of AAQ in Urban, Rural and Industrial areas | CO4 |
| 23 | 15.02.2021 | | CO4 | 23 | 15.02.2021 | | CO4 |

**Year: I**

**Semester: I**

6. **Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ENV21004**
7. **Course : Air and Noise Pollution** **L: 3**
8. **Program : M.Tech (Environmental Engineering)** **T: 1**
9. **Target : 60%** **P: 0**

**C: 4**

**Remarks: NA**

**Signature of Faculty**

**Date: 15.02.2021**

Year: I

Semester: I

6. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ENV21004
7. Course : Air and Noise Pollution — L: 3
8. Program : M.Tech (Environmental Engineering) — T: 1
9. Target : 60% — P: 0
C: 4

# PERIODIC MONITORING

**Actual date of completion and remarks, if any**

| Components | | From | To | From | To |
|---|---|---|---|---|---|
| Duration (Mention from and to Dates) | | 01.09.2020 | 16.01.2021 | 18.01.2021 | 22.03.2021 |
| Percentage of Syllabus covered | | 76% | | 24% | |
| Lectures | Planned | 1 | 34 | 35 | 45 |
| | Taken | 1 | 34 | 35 | 45 |
| Tutorials | Planned | 1 | 12 | 13 | 15 |
| | Taken | 1 | 12 | 13 | 15 |
| Test/Quizzes/ Mid Semester/ End Semester | Planned | 1 | 1 (MID) | 2 | 1 (END) |
| | Taken | 1 | 1 | 2 | 1 |
| | CO's Addressed | CO1 & CO2 | CO1 & CO2 | CO2, CO3 & CO4 | CO1, CO2, CO3, & CO4 |
| | CO's Achieved | CO1 & CO2 | CO1 & CO2 | CO2, CO3 & CO4 | CO1, CO2, CO3, & CO4 |
| Signature of Faculty | | | | | |
| Head of the Department | | | | | |
| OBE Coordinator | | | | | |

**Signature of HOD/ Dean**

**Date: 26.03.2021**

**Signature of Faculty**

**Date: 26.03.2021**

Year: I

Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ECE61107
2. Course : Air and Noise Pollution — L: 3
3. Program : M.Tech (Environmental Engineering) — T: 1
4. Target : 60% — P: 0
C: 4

# PERIODIC MONITORING

**Attainment of the Course (Learning) Outcomes:**

| Components | Attainment level | Action Plan | Remarks |
|---|---|---|---|
| Quiz/Test etc. | CO1: | Conducted on 14.12.2020 | Module 1 |
| | CO2: | Conducted on 14.12.2020, 25.02.2021 | Module 2 |
| | CO3: | Conducted on 25.01.2021 25.02.2021 | Module 3 |
| | CO4: | Conducted on 25.02.2021 | Module 3 |
| Mid Semester | CO1: | Scheduled on 13.01.2021 | Question Bank Given for CO1 and CO2 to understand the Pattern of Exam |
| | CO2: | | |
| | CO3: | --- | |
| | CO4: | --- | |
| End Semester | CO1: | Scheduled on 12.03.2021 | Question Bank Given for all COs to understand the Pattern of Exam |
| | CO2: | | |
| | CO3: | | |
| | CO4: | | |
| Any Other | CO1: | NA | |
| | CO2: | | |
| | CO3: | | |
| | CO4: | | |

Signature of HOD/ Dean

Date: 26.03.2021

Signature of Faculty

Date: 26.03.2021

Year: I

Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ECE61107
2. Course : Air and Noise Pollution — L: 3
3. Program : M.Tech (Environmental Engineering) — T: 1
4. Target : 60% — P: 0
C: 4

# Previous Year Question Paper

ADAMAS UNIVERSITY

PURSUE EXCELLENCE

**ADAMAS UNIVERSITY**

**END-SEMESTER EXAMINATION: DECEMBER 2019**

# Annexure - A

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

# Question Bank Sample

**School: School of Engineering & Technology** **Department: Civil Engineering**

**Course Code: ECE61107** **Course Name: Air and Noise Pollution**

**Program: M.Tech (Environmental Engineering)** **Semester: I**

**UNIT NUMBER: I** **UNIT NAME: Environment Pollution**

| Sl. No. | Question | Level of Difficulty (Easy/ Medium/ Difficult) | Knowledge Level (Bloom's Taxonomy) | Course Outcome (CO) |
|---|---|---|---|---|
| | **Part A (Multiple Choice Questions) (1 mark each)** | | | |
| 1. | **Define** Environmental pollution. | **Easy** | **Remember** | **CO1** |
| 2. | **List** different kinds of environmental pollution. | **Medium** | **Remember** | **CO1** |
| 3. | **What** is PAN? | **Difficult** | **Remember** | **CO1** |
| | **Part B (Definition/Naming Questions) (2 marks each)** | | | |
| 1. | **Define** unpolluted air. | **Easy** | **Remember** | **CO1** |
| 2. | **What** are the gaseous and vapour pollutants present in atmosphere? | **Medium** | **Remember** | **CO1** |
| 3. | **Define** Air pollution and air pollutants. | **Difficult** | **Remember** | **CO1** |
| | **Part C (Short Questions) (3-4 marks each)** | | | |
| 1. | **What** is AQI? Briefly discuss. | **Easy** | **Remember** | **CO1** |
| 2. | **How** can the particulate air pollutants be monitored in ambient air? | **Medium** | **Remember** | **CO1** |
| 3. | **Outline** the difference between Primary and secondary air pollutants. | **Difficult** | **Understand** | **CO1** |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | | |
|---|---|---|---|---|
| **Part D (Explanation Based Questions) (5 marks each)** | | | | |
| 1. | **Explain** the health effects of $SO_2$ and $NO_x$ as air pollutants. | **Easy** | **Understand** | **CO1** |
| 2. | **Explain** the health effects of SPM and Ozone as air pollutants. | **Medium** | **Understand** | **CO1** |
| 3. | **Explain** the effects of air pollutants on materials and services. | **Difficult** | **Understand** | **CO1** |
| **Part E (Questions Based on Reasoning/ Problems Based Questions) (5 marks each)** | | | | |
| 1. | **Illustrate** about monitoring of $SO_2$ in ambient air. | **Easy** | **Understand** | **CO1** |
| 2. | **Explain** the effects of air pollutants on Live-stock animals. | **Medium** | **Understand** | **CO1** |
| 3. | **Explain** the effects of air pollutants on Plants and Aquatic life. | **Difficult** | **Understand** | **CO1** |
| **Part F (Application Based Questions) (5-10 marks each)** | | | | |
| 1. | **Explain** about different Secondary air pollutants and also about Hydrocarbons as air pollutants. | **Easy** | **Understand** | **CO1** |
| 2. | **Identify** the sources of different Primary air pollutants. | **Medium** | **Apply** | **CO1** |
| 3. | **Identify** various pollutants causing pollution of Air with their proper classification. | **Difficult** | **Apply** | **CO1** |
| **Part G (Short Notes) (5 marks each)** | | | | |
| 1. | **Illustrate** about Environment (Protection) Act. | **Easy** | **Understand** | **CO1** |
| 2. | **Illustrate** about Photochemical smog. | **Medium** | **Understand** | **CO1** |
| 3. | **Illustrate** about particulates as air pollutants. | **Difficult** | **Understand** | **CO1** |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

**School: School of Engineering & Technology** **Department: Civil Engineering**

**Course Code: ECE61107** **Course Name: Air and Noise Pollution**

**Program: M.Tech (Environmental Engineering)** **Semester: I**

**UNIT NUMBER: II** **UNIT NAME: Self-cleansing properties of the environment**

| Sl. No. | Question | Level of Difficulty (Easy/ Medium/ Difficult) | Knowledge Level (Bloom's Taxonomy) | Course Outcome (CO) |
|---|---|---|---|---|
| | **Part A (Multiple Choice Questions) (1 mark each)** | | | |
| 1. | **What** is dilution method for controlling air pollution? | **Easy** | **Remember** | **CO2** |
| 2. | **List** any three methods of Engineered control of Air pollutants. | **Medium** | **Remember** | **CO2** |
| 3. | **Define** Lapse rate. | **Difficult** | **Remember** | **CO2** |
| | **Part B (Definition/Naming Questions) (2 marks each)** | | | |
| 1. | **Define** ELR and ALR. | **Easy** | **Remember** | **CO2** |
| 2. | **What** is Negative lapse rate? Discuss with proper diagram. | **Medium** | **Remember** | **CO2** |
| 3. | **Explain** stable and unstable atmospheric conditions. | **Difficult** | **Understand** | **CO2** |
| | **Part C (Short Questions) (3-4 marks each)** | | | |
| 1. | **Explain** about the impact of Winds on dispersion of air pollutants. | **Easy** | **Understand** | **CO2** |
| 2. | **Explain** inversion in atmosphere and its types. | **Medium** | **Understand** | **CO2** |
| 3. | **Illustrate** Dilution method for controlling air pollution from stationary sources. | **Difficult** | **Understand** | **CO2** |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | | |
|---|---|---|---|---|
| **Part D (Explanation Based Questions) (5 marks each)** | | | | |
| 1. | **Explain** about Self-cleansing properties of Environment in brief. | **Easy** | **Understand** | **CO2** |
| 2. | **Explain** Effective height of stack. | **Medium** | **Understand** | **CO2** |
| 3. | **Illustrate** about absorption units and adsorption units in terms of Engineered Control of gaseous air pollutants. | **Difficult** | **Understand** | **CO2** |
| **Part E (Questions Based on Reasoning/ Problems Based Questions) (5 marks each)** | | | | |
| 1. | **Explain** centrifugal collectors for controlling particulate air pollutants. | **Easy** | **Understand** | **CO2** |
| 2. | **Explain** different types of wet scrubbers/ collectors with neat sketches. | **Medium** | **Understand** | **CO2** |
| 3. | **Compare** between Gravitational settling chamber and Fabric filters for air pollution control. | **Difficult** | **Analyze** | **CO2** |
| **Part F (Application Based Questions) (5-10 marks each)** | | | | |
| 1. | **Illustrate** about different types of Plume behaviours under different environmental conditions with neat sketches. | **Easy** | **Understand** | **CO2** |
| 2. | **Solve** the following problem – An industry utilizes 0.3 ML of fuel oil per month. It is estimated that yearly the emitted quantity of various pollutants for every 1 ML of fuel oil burning are: particulate matter = 2.9 t, $SO_2$ = 60 t, $NO_X$ = 8 t, HC = 0.4 t and CO = 0.5 t. Find out the chimney height required for safe dispersion of the pollutants. | **Medium** | **Apply** | **CO2** |
| 3. | **Solve** the following problem – Determine the effective height of a stack in a factory with the following data obtained from the factory and its surroundings: Wind velocity = 2.75 m/s, air temperature = $20^0$C, pressure in barometer = $10^3$ millibars, structural height of stack = 180 m, inside diameter of stack = 0.95 m, gas velocity in stack = 11.12 m/s, temperature of gas inside stack = $160^0$C. | **Difficult** | **Apply** | **CO2** |
| **Part G (Short Notes) (5 marks each)** | | | | |
| 1. | **Illustrate** absorption and adsorption in terms of natural way of air pollution control. | **Easy** | **Understand** | **CO2** |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | | |
|---|---|---|---|---|
| 2. | **Explain** different methods used for controlling air pollution from automobiles. | **Medium** | **Understand** | **CO2** |
| 3. | **Explain** about electrostatic precipitators. | **Difficult** | **Understand** | **CO2** |

**School: School of Engineering & Technology** **Department: Civil Engineering**

**Course Code: ECE61107** **Course Name: Air and Noise Pollution**

**Program: M.Tech (Environmental Engineering)** **Semester: I**

**UNIT NUMBER: III** **UNIT NAME: Noise Pollution**

| **Sl. No.** | **Question** | **Level of Difficulty (Easy/ Medium/ Difficult)** | **Course Outcome (CO)** |
|---|---|---|---|

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | |
|---|---|---|---|
| | | | |
| | **Part A (Multiple Choice Questions) (1 mark each)** | | |
| 1. | **Define** noise. | **Easy** | **CO3** |
| 2. | **List** out the sources of noise pollution. | **Medium** | **CO3** |
| 3. | **What** is the maximum permissible average annual specified standard (in $\mu g/m^3$) of $SO_2$ for industrial areas in the revised National Ambient Air Quality Standards (2009) in India? | **Difficult** | **CO4** |
| | **Part B (Definition/Naming Questions) (2 marks each)** | | |
| 1. | **Define** period and wavelength of sound with diagram. | **Easy** | **CO3** |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | |
|---|---|---|---|
| | | | |
| 2. | **What** is sound pressure? | **Medium** | **CO3** |
| 3. | **What** are the maximum permissible average annual and 24 hourly specified standards (in $\mu g/m^3$) of PM10 and PM2.5 for rural areas in the revised National Ambient Air Quality Standards (2009) in India? | **Difficult** | **CO4** |
| **Part C (Short Questions) (3-4 marks each)** | | | |
| 1. | **Explain** Power and Intensity of sound. | **Easy** | **CO3** |
| 2. | **Explain** Octave band analysis for Sound. | **Medium** | **CO3** |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | |
|---|---|---|---|
| 3. | **Illustrate** the AAQ standards in respect of Noise as specified under Environment (Protection) Act, 1986 for different area/zones at day time and night time. | **Difficult** | **CO4** |

| **Part D (Explanation Based Questions) (5 marks each)** | | | | |
|---|---|---|---|---|
| 1. | **Explain** Levels of noise. | **Easy** | **Understand** | **CO3** |
| 2. | **Explain** the effects of Noise pollution. | **Medium** | **Understand** | **CO3** |
| 3. | **Illustrate** about Continuous Ambient Air Quality Monitoring (CAAQM) Stations. | **Difficult** | **Understand** | **CO4** |
| **Part E (Questions Based on Reasoning/ Problems Based Questions) (5 marks each)** | | | | |
| 1. | **Explain** addition of sound levels in decibels with example of adding two different 50 dB noise. | **Easy** | **Understand** | **CO3** |
| 2. | **Explain** $L_N$ and $L_{eq}$ concept related to Noise pollution. | **Medium** | **Understand** | **CO3** |
| 3. | **Compare** three weighting networks of sound with suitable diagram. | **Difficult** | **Analyze** | **CO3** |
| **Part F (Application Based Questions) (5-10 marks each)** | | | | |
| 1. | **Solve** the following problem – In a noise measurement process, 4 readings are recorded as 40, 50, 62 and 72 dB with respect to 20 μPa as reference. Find out the average sound pressure level for the noise measurement process. | **Easy** | **Apply** | **CO3** |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

<table>
<tr><td>2.</td><td>Solve the following problem –<br>What is the $L_{eq}$ value for the given traffic noise data as following?<br><table><tr><td>Time (s)</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr><tr><td>Noise level (dBA)</td><td>71</td><td>75</td><td>70</td><td>78</td><td>80</td></tr></table><br><table><tr><td>Time (s)</td><td>60</td><td>70</td><td>80</td><td>90</td><td>100</td></tr><tr><td>Noise level (dBA)</td><td>84</td><td>76</td><td>74</td><td>75</td><td>74</td></tr></table></td><td>Medium</td><td>Apply</td><td>CO3</td></tr>
<tr><td>3.</td><td>Solve the following problem –<br>A coal fired 1000 MW power plant is being operated at around 40% efficiency. The ash and sulphur content in the coal used respectively are 35% and 3% and the calorific value of coal is 21 MJ/ kg. Find out the emission rate of $SO_2$ from the plant and also determine the total ash produced per day.</td><td>Difficult</td><td>Apply</td><td>CO4</td></tr>
<tr><td colspan="5">Part G (Short Notes) (5 marks each)</td></tr>
<tr><td>1.</td><td>Illustrate Noise abatement and Control.</td><td>Easy</td><td>Understand</td><td>CO3</td></tr>
<tr><td>2.</td><td>Illustrate about Averaging sound pressure levels with necessary formula.</td><td>Medium</td><td>Understand</td><td>CO3</td></tr>
<tr><td>3.</td><td>Explain about recent techniques of online stack monitoring and Emission inventory.</td><td>Difficult</td><td>Understand</td><td>CO4</td></tr>
</table>

## Lecture Notes – Sample

# Annexure - B

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

# Internal Assessment – Class Test 1

**M.Tech Environmental Engineering**

**Subject Name & Code – Air & Noise Pollution (ECE61107)**

**Date : 14/12/2020** **Class Test – 1** **Duration – 1 hr. 30 minutes** **Full Marks - 20**

Answer any **Four** of the following : (4 x 5 = 20)

1) (a) Describe about effects of air pollution in various environmental bodies.
(b) Mention Lapse rate with graphical representation.

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

2) Explain about controlling process of air pollution from automobiles. Also mention the utility of catalytic convertors in air pollution control.

3) An industry consumes 6 ML of fuel oil per year. From the investigation it is observed that yearly the amount of pollutants, particulate matter, $SO_2$ , $NO_X$ , HC and CO emits due to burning of unit ML of fuel oil are 5 ton, 65 ton, 10 ton, 0.8 ton and 1 ton respectively. Find out the chimney height required for safe dispersion of the pollutants.

4) Discuss about air pollution controlling process by natural and installing engineering devices from stationary sources.

5) Derive the mathematical expressions for "Dry Adiabatic Lapse Rate".

6) Show the diagrams and explain how Plume behaves under different environmental conditions.

7) Following are the data obtained from a factory and its surroundings :

Wind velocity = 3 m/s, air temperature = $27^0$C, pressure in barometer = $10^3$ mbar, structural height of stack = 200 m, inner diameter of stack = 0.9 m, gas velocity in stack = 12 m/s, temperature of gas inside stack = $170^0$C. Determine the effective height of stack.

# Class Test 1 Answer Script sample - Annexure - C

## Internal Assessment – Class Test 2

**Class Test -2, Date : 25/01/2021 , Time - 50 minutes**

Answer all the questions :

1 . Discuss about effects of undesirable sound in environment. (2)

2 . Derive the expression and how difference between faintest & loudest sound can be avoided. (2)

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

3 . Explain about the important concept of weighted networks related to sound measurements. (3)

4 . Choose the incorrect one: (1)

(a ) Higher the Octave frequency range lower the geometric average frequency.

(b ) In weighted network system $L_A > L_B > L_C$

(c ) 1 dB = 0.1 B (d) period is inversely proportional to frequency

5 . If two different noises i.e 45 dB & 55 dB produced. Find out "Sound Pressure Level". (3)

6 . Differentiate and compare between $L_n$, $L_{eq}$ & $L_{dn}$ . (3)

7 . A 80 dB (A) with reference to 20 μPa noise is accompanied with another 80 dB (A). Determine the total noise level. (4)

8 . Compare and classify about Noise related to noise rating. (2)

# Class Test 2 Answer Script sample - Annexure - D

## Internal Assessment – Class Test 3

**M.Tech Environmental Engineering**

**Air & Noise Pollution**

**25.02.2021 (CT3)**

Answer all the questions: (6 x 5 = 30)

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

1. Discuss about various mechanical devices used to control particulate pollutants in industries and recent techniques of online stack monitoring.
2. Explain about the concept of Catalytic converter in controlling automobile pollution.
3. Explain the stability of the ambient environment with respect to relative positions of ELR line & ALR line.
4. 60 dB (A) re: 20 µPa noise accompanied with another 60 dB (A) re:20 µPa noise. What will be the total noise level?
5. While recording A-weighted sound levels, 4 readings have been taken at a site at different times of a day. These readings are : 20, 56, 66 & 42 dB(A) re:20 µPa. Determine the average sound level.
6. Compare about different types of noise considered in noise pollution.

# Class Test 3 Answer Script sample - Annexure - E

| | | | |
|---|---|---|---|
| ADAMAS UNIVERSITY PURSUE EXCELLENCE | **ADAMAS UNIVERSITY**<br>**MID-SEMESTER EXAMINATION: JANUARY 2021**<br>(Academic Session: 2020 – 21) | | |
| **Name of the Program:** | M. Tech | **Semester:** | I |
| **Paper Title:** | Air & Noise Pollution | **Paper Code:** | ECE61107 |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | |
|---|---|---|---|
| **Maximum Marks:** | 20 | **Time duration:** | 2 Hrs |
| **Total No of questions:** | 06 | **Total No of Pages:** | 01 |
| *(Any other information for the student may be mentioned here)* | **1.** At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.<br>**2.** All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.<br>**3.** Assumptions made if any, should be stated clearly at the beginning of your answer. | | |

***Answer all the Groups***

**Group A**

Answer all the questions of the following $5\times1 = 5$

**1.** **a)** What is Aerosol ? [CO:1]

**b)** Define PAN. [CO:1]

**c)** Which is the major pollutant present in photochemical smog ? [CO:1]

**d)** Mention about three way catalytic convertor. [CO:2]

**e)** What is negative Lapse rate? [CO:2]

**GROUP –B**

Answer *any three* of the following $3\times5 = 15$

2. Define air pollution and differentiate between natural and man-made air pollutions. [CO:1]

**3.** Describe about control of particulate pollutants in industries in detail. [CO:1]

**4.** Derive the mathematical expressions for Adiabatic lapse rate to define Dry Adiabatic Lapse Rate value. [CO:2]

**5.** Find the effective height of a chimney. Use below mentioned data :

Actual height of chimney is 190m, internal diameter of chimney is 1m, wind velocity is 3m/s, surrounding temperature is $20^0$C, barometric pressure is $10^3$ milllibars, velocity of gas emitting from chimney is 12m/s and temperature of gas emits from chimney is $150^0$C. [CO:2]

Year: I

Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ECE61107
2. Course : Air and Noise Pollution — L: 3
3. Program : M.Tech (Environmental Engineering) — T: 1
4. Target : 60% — P: 0
C: 4

# Mid Semester Answer Script Sample - Annexure - F

## Evaluation Sheet – Mid Semester

| Roll Number | Registration Number | Name of the Student | Marks (20) |
|---|---|---|---|
| PG/02/MTEVE/2020/001 | AU/2020/0004291 | SNEHASHIS GHOSH | 17 |
| PG/02/MTEVE/2020/002 | AU/2020/0004450 | SRIJA SINHAROY | 18 |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | |
|---|---|---|---|
| PG/02/MTEVE/2020/003 | AU/2020/0004454 | SUMIT KUMAR KHAN | 18 |
| PG/02/MTEVE/2020/004 | AU/2020/0004460 | SUSMITA PANDIT | 17 |

**Signature of HOD/Dean** **Signature of Faculty**

**Date: 16.01.2021** **Date: 16.01.2021**

# Planning for Remedial Classes – Mid Semester

Year: I

Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ECE61107
2. Course : Air and Noise Pollution — L: 3
3. Program : M.Tech (Environmental Engineering) — T: 1
4. Target : 60% — P: 0
C: 4

| Sl. No. | Name of Student | Roll No. | Reg. No. | Mid Sem Marks | Remedial Classes Held | | | | | | | Class test on the basis of Remedial Classes | End Sem Marks | Improvement (Y/N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Date | | | | | | | | | |
| | | | | | Venue | | | | | | | | | |
| | | | | | Time | | | | | | | | | |
| 1. | Nil | Nil | Nil | Nil | Nil | Nil | Nil | | | | | Nil | Nil | NA |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Signature of HOD/ Dean

Date: 16.01.2021

Signature of Faculty

Date: 16.01.2021

## Evaluation Sheet – Internal Assessment (Sample)

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| Roll Number | Registration Number | Name of the Student | Internal Assessment (30) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Class Test (10+10+10 =30) | | | Case Study | etc. | Total |
| | | | 1 | 2 | 3 | | | |
| PG/02/MTEVE/2020/001 | AU/2020/0004291 | SNEHASHIS GHOSH | 10 | 10 | 8 | NA | | 28 |
| PG/02/MTEVE/2020/002 | AU/2020/0004450 | SRIJA SINHAROY | 10 | 10 | 8 | NA | | 28 |
| PG/02/MTEVE/2020/003 | AU/2020/0004454 | SUMIT KUMAR KHAN | 10 | 10 | 8 | NA | | 28 |
| PG/02/MTEVE/2020/004 | AU/2020/0004460 | SUSMITA PANDIT | 10 | 10 | 8 | NA | | 28 |

**Signature of HOD/Dean** **Signature of Faculty**

**Date: 26.02.2021** **Date: 26.02.2021**

## COURSE END SURVEY

## INDIRECT ASSESSMENT

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

**Sample format for Indirect Assessment of Course outcomes:**

| |
|---|
| NAME: SNEHASHIS GHOSH |
| ROLL NO.: PG/02/MTEVE/2020/001 |
| REG. NO.: AU/2020/0004291 |
| COURSE: Air and Noise Pollution |
| PROGRAM: M.Tech (Environmental Engineering) |

Please rate the following aspects of course outcomes of **Air and Noise Pollution.**

Use the scale 1-5 (Poor – Excellent)

| Course Outcomes | Statement | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| CO1 | Can you able to Explain the basic principles on various aspects of atmospheric chemistry? | | | | | 5 |
| CO2 | Are you able to Recognize the major sources, effects and monitoring of air and noise pollutants? | | | | | 5 |
| CO3 | Do you Understand the key transformations and meteorological influence on air and noise? | | | | 4 | |
| CO4 | Will you Demonstrate the pollution regulation on its scientific basis? | | | | 4 | |

**Sample format for Indirect Assessment of Course outcomes:**

| |
|---|
| NAME: SRIJA SINHAROY |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| |
|---|
| ROLL NO.: PG/02/MTEVE/2020/002 |
| REG. NO.: AU/2020/0004450 |
| COURSE: Air and Noise Pollution |
| PROGRAM: M.Tech (Environmental Engineering) |

Please rate the following aspects of course outcomes of **Air and Noise Pollution.**

Use the scale 1-5 (Poor – Excellent)

| Course Outcomes | Statement | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| CO1 | Can you able to Explain the basic principles on various aspects of atmospheric chemistry? | | | | 4 | |
| CO2 | Are you able to Recognize the major sources, effects and monitoring of air and noise pollutants? | | | | 4 | |
| CO3 | Do you Understand the key transformations and meteorological influence on air and noise? | | | | 4 | |
| CO4 | Will you Demonstrate the pollution regulation on its scientific basis? | | | | 4 | |

**Sample format for Indirect Assessment of Course outcomes:**

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| |
|---|
| NAME: SUMIT KUMAR KHAN |
| ROLL NO.: PG/02/MTEVE/2020/003 |
| REG. NO.: AU/2020/004454 |
| COURSE: Air and Noise Pollution |
| PROGRAM: M.Tech (Environmental Engineering) |

Please rate the following aspects of course outcomes of **Air and Noise Pollution.**

Use the scale 1-5 (Poor – Excellent)

| Course Outcomes | Statement | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| CO1 | Can you able to Explain the basic principles on various aspects of atmospheric chemistry? | | | | | 5 |
| CO2 | Are you able to Recognize the major sources, effects and monitoring of air and noise pollutants? | | | | | 5 |
| CO3 | Do you Understand the key transformations and meteorological influence on air and noise? | | | | 4 | |
| CO4 | Will you Demonstrate the pollution regulation on its scientific basis? | | | | 4 | |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

**Sample format for Indirect Assessment of Course outcomes:**

| |
|---|
| NAME: SUSMITA PANDIT |
| ROLL NO.: PG/02/MTEVE/2020/004 |
| REG. NO.: AU/2020/004460 |
| COURSE: Air and Noise Pollution |
| PROGRAM: M.Tech (Environmental Engineering) |

Please rate the following aspects of course outcomes of **Air and Noise Pollution.**

Use the scale 1-5 (Poor – Excellent)

| Course Outcomes | Statement | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| CO1 | Can you able to Explain the basic principles on various aspects of atmospheric chemistry? | | | | | 5 |
| CO2 | Are you able to Recognize the major sources, effects and monitoring of air and noise pollutants? | | | | | 5 |
| CO3 | Do you Understand the key transformations and meteorological influence on air and noise? | | | | 4 | |
| CO4 | Will you Demonstrate the pollution regulation on its scientific basis? | | | | 4 | |

Year: I

Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ECE61107
2. Course : Air and Noise Pollution — L: 3
3. Program : M.Tech (Environmental Engineering) — T: 1
4. Target : 60% — P: 0
C: 4

# INDIRECT ASSESSMENT CONSOLIDATION

**ADAMAS UNIVERSITY, KOLKATA**
**SCHOOL OF ENGINEERING AND TECHNOLOGY**
**DEPARTMENT OF CIVIL ENGINEERING**
**CO Indirect Assessment**

**Programme: M.Tech (Environmental Engineering)** **Academic Year:2020-21**
**Batch: 2020-22**

**Course Code & Name: ECE61107 & Air and Noise Pollution**

| Course Outcome | Students Feed Back (5) | Attainment (100) |
|---|---|---|
| CO1 | 4.75 | 95 |
| CO2 | 4.75 | 95 |
| CO3 | 4 | 80 |
| CO4 | 4 | 80 |
| etc. | | |

**Signature of HOD/Dean**
**Date: 26.02.2021**

**Signature of Faculty**
**Date: 26.02.2021**

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | |
|---|---|---|---|
| ADAMAS UNIVERSITY PURSUE EXCELLENCE | **ADAMAS UNIVERSITY**<br>**END SEMESTER EXAMINATION**<br>(Academic Session: 2020 – 21) | | |
| **Name of the Program:** | M.Tech | **Semester:** | I |
| **Paper Title:** | Air & Noise Pollution | **Paper Code:** | ECE61107 |
| **Maximum Marks:** | 50 | **Time Duration:** | 3 Hrs |
| **Total No. of Questions:** | 29 | **Total No of Pages:** | 02 |
| *((Assume suitable data if required))* | **1.** At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.<br>**2.** All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.<br>**3.** Assumptions made if any, should be stated clearly at the beginning of your answer. | | |

| | | | |
|---|---|---|---|
| **Group A**<br>**Answer All the Questions (5 x 1 = 5)** | | | |
| 1 | AQI stands for what? | **R** | **CO1** |
| 2 | Define “Washout or Scavenging”. | **R** | **CO2** |
| 3 | What is Aerosol? | **R** | **CO2** |
| 4 | Which is the major pollutant present in photochemical smog? | **R** | **CO4** |
| 5 | Define sound pressure level. | **R** | **CO3** |
| **Group B**<br>**Answer Allthe Questions (5 x 2 = 10)** | | | |
| 6 a) | Find the effective height of a chimney. Use below mentioned data : Actual height of chimney is 190 m, internal diameter of chimney is 1m, wind velocity is 3 m/s, surrounding temperature is $20^0$C, barometric pressure is $10^3$ milllibars, velocity of gas emitting from chimney is 12 m/s and temperature of gas emits from chimney is $150^0$C. | **R** | **CO1** |
| **(OR)** | | | |
| 6 b) | Discuss about lead as a major pollutant. | **Cr** | **CO1** |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | |
|---|---|---|---|
| 7 a) | Discuss about characteristics of three weighting networks. | **Cr** | **CO1** |
| | **(OR)** | | |
| 7 b) | Demonstrate the expression for "Perfect Gas Law". | **U** | **CO1** |
| 8 a) | Discuss about Hydrocarbons in context of air pollutants. | **Cr** | **CO4** |
| | **(OR)** | | |
| 8 b) | Explain about different types of inversion. | **U** | **CO4** |
| 9 a) | Demonstrate limiting values of noise levels ($L_{eq}$) corresponding to area/zone category for ambient air quality standards in respect of noise recommended by India's Environmental Protection Act,1986. | **U** | **CO3** |
| | **(OR)** | | |
| 9 b) | Show the sinusoidal sound waves due to alternate compression and rarefaction of air molecules. | **U** | **CO3** |
| 10 a) | Distinguish between various types of noise related to Noise Rating Systems. | **An** | **CO3** |
| | **(OR)** | | |
| 10 b) | Elaborate about noise abatment. | **Cr** | **CO3** |
| | **Group C**<br>**Answer Allthe Questions (7 x 5 = 35)** | | |
| 11 a) | Discuss about air pollution controlling process by natural and installing engineering devices from stationary sources. | **Cr** | **CO2** |
| | **(OR)** | | |
| 11 b) | A power plant produce 1000 MW utilizing coal. Plant efficiency is 40%. 1 kg coal burning generates 22 MJ. During operation of burning following pollutants generates; Ash content = 34% from coal, Sulphur content = 4% from coal. Determine the emission rate of sulphur dioxide pollutant from the power plant. **(Mod-2)** | **E** | **CO2** |
| 12 a) | Determine the effective length of a chimney of physical height 180 m with 0.95 m diameter, wind velocity of 2.75 m/sec, $20^0$C air temperature, barometric pressure of 1000 millibars. Velocity of gas emitting from stack is 11.12 m/sec and gas temperature in stack is $160^0$C. | **E** | **CO2** |
| | **(OR)** | | |
| 12 b) | Develop the equation for minimum chimney height as per Emission Regulations (Part-1) in Indian conditions. | **Ap** | **CO2** |
| 13 a) | Evaluate $L_{eq}$ from the noise data given below: | **E** | **CO3** |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Time(Sec) | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | | |
| | | dBA L(t) | 71 | 75 | 70 | 78 | 80 | 84 | 76 | 74 | 75 | 74 | | |
| | **(OR)** | | | | | | | | | | | | | |
| 13 b) | Show the cumulative distribution curve related to Noise Rating Systems. | | | | | | | | | | | | **U** | **CO3** |
| 14 a) | Summarize about effects of air pollution on various sectors in atmosphere. | | | | | | | | | | | | **U** | **CO4** |
| | **(OR)** | | | | | | | | | | | | | |
| 14 b) | Classify about Plume. | | | | | | | | | | | | **An** | **CO4** |
| 15 a) | A coal fired 1000 MW power plant is operating around 38% efficiency. The ash and sulphur content in the coal used respectively are 35% and 3%, and the calorific value of 21 MJ/kg of coal. Find the emission rate of $SO_2$ from the plant. | | | | | | | | | | | | **R** | **CO4** |
| | **(OR)** | | | | | | | | | | | | | |
| 15 b) | Discuss about "Gravitational settling chambers" to control particulate matter. | | | | | | | | | | | | **Cr** | **CO4** |
| 16 a) | Explain about "Electrostatic Precipitator" | | | | | | | | | | | | **U** | **CO1** |
| | **(OR)** | | | | | | | | | | | | | |
| 16 b) | What is photochemical smog and how it is formed ? | | | | | | | | | | | | **R** | **CO1** |
| 17 a) | Discuss about air pollution controlling process by natural and installing engineering devices from stationary sources. | | | | | | | | | | | | **Cr** | **CO2** |
| | **(OR)** | | | | | | | | | | | | | |
| 17 b) | Explain about unstable , stable and neutral environment. | | | | | | | | | | | | **E** | **CO2** |

Note: The Sample prepared by assuming 5 COs in a course, considering one CO for one Module.

i) If the COs are higher in numbers that can be managed by equating sub-divisional questions

ii) If the COs are lower in numbers, the questions can be increased by equating the number of COs

# End Semester Answer Script Sample - Annexure - G

Year: I

Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ECE61107
2. Course : Air and Noise Pollution — L: 3
3. Program : M.Tech (Environmental Engineering) — T: 1
4. Target : 60% — P: 0
C: 4

# Evaluation Sheet (End Semester)

| Roll Number | Registration Number | Name of the Student | Marks (50) |
|---|---|---|---|
| PG/02/MTEVE/2020/001 | AU/2020/0004291 | SNEHASHIS GHOSH | 40 |
| PG/02/MTEVE/2020/002 | AU/2020/0004450 | SRIJA SINHAROY | 47 |
| PG/02/MTEVE/2020/003 | AU/2020/0004454 | SUMIT KUMAR KHAN | 42 |
| PG/02/MTEVE/2020/004 | AU/2020/0004460 | SUSMITA PANDIT | 44 |

**Signature of HOD/Dean**

**Date: 26.03.2021**

**Signature of Faculty**

**Date: 26.03.2021**

Year: I

Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ECE61107
2. Course : Air and Noise Pollution — L: 3
3. Program : M.Tech (Environmental Engineering) — T: 1
4. Target : 60% — P: 0
C: 4

# Planning for Remedial Classes – End Semester

| Sl. No. | Name of Student | Roll No. | Reg. No. | End Sem Marks | Remedial Classes Held | | | | | | | Class test on the basis of Remedial Classes | Supple Exam Marks | Improvement (Y/N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Date | | | | | | | | | |
| | | | | | Venue | | | | | | | | | |
| | | | | | Time | | | | | | | | | |
| 1. | Nil | Nil | Nil | Nil | Nil | Nil | Nil | | | | | Nil | Nil | NA |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

**Signature of HOD/ Dean** **Signature of Faculty**

**Date: 26.03.2021** **Date: 26.03.2021**

# Content beyond Syllabus

## Acid Rain, Ozone Depletion, Global warming

Reference: Environmental Engineering (Vol. II) - Sewage Disposal and Air Pollution Engineering – Santosh Kumar Garg – Khanna Publishers – Page No. 689-712.

Year: I

Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ECE61107
2. Course : Air and Noise Pollution — L: 3
3. Program : M.Tech (Environmental Engineering) — T: 1
4. Target : 60% — P: 0
C: 4

# Consolidated Mark Statement

| Roll Number | Registration Number | Name of the Student | Total Marks | | | |
|---|---|---|---|---|---|---|
| | | | Mid Semester (20) | Internal Assessment (30) | End Semester (50) | Total (100) |
| PG/02/MTEVE/2020/001 | AU/2020/0004291 | SNEHASHIS GHOSH | 17 | 28 | 40 | 85 |
| PG/02/MTEVE/2020/002 | AU/2020/0004450 | SRIJA SINHAROY | 18 | 28 | 47 | 93 |
| PG/02/MTEVE/2020/003 | AU/2020/0004454 | SUMIT KUMAR KHAN | 18 | 28 | 42 | 88 |
| PG/02/MTEVE/2020/004 | AU/2020/0004460 | SUSMITA PANDIT | 17 | 28 | 44 | 89 |

Signature of Dean/HOD

Date: 26.03.2021

Signature of Faculty

Date: 26.03.2021

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

Year: I

Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ECE61107
2. Course : Air and Noise Pollution — L: 3
3. Program : M.Tech (Environmental Engineering) — T: 1
4. Target : 60% — P: 0
C: 4

# CO ATTAINMENT – GAP ANALYSIS & REMEDIAL MEASURES

**ADAMAS UNIVERSITY, KOLKATA**
**SCHOOL OF ENGINEERING AND TECHNOLOGY**
**DEPARTMENT OF CIVIL ENGINEERING**
**CO ATTAINMENT - GAP ANALYSIS & REMEDIAL MEASURES**

| Batch : | 2020-22 | | | Academic Year: | 2020-21 |
|---|---|---|---|---|---|
| Course Code & Name | | Name of the Coordinator | | Year & Semester | |
| ECE61107 & Air and Noise Pollution | | Jayanta Nath Chowdhury | | I & I | |

| CO | Direct Assessment | Indirect Assessment | CO Attainment | Target | CO Attainment Gaps | Action for Bridge the Gap | Target Modification |
|---|---|---|---|---|---|---|---|
| CO1 | 100 | 95 | 99 | **70** | -29 | | **90** |
| CO2 | 100 | 95 | 99 | **70** | -29 | | **90** |
| CO3 | 100 | 80 | 96 | **70** | -26 | | **90** |
| CO4 | 100 | 80 | 96 | **70** | -26 | | **90** |

Year: I

Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury
2. Course : Air and Noise Pollution
3. Program : M.Tech (Environmental Engineering)
4. Target : 60%

Course Code: ECE61107
L: 3
T: 1
P: 0
C: 4

Signature of HOD/Dean

Date: 07.04.2021

Signature of Faculty

Date: 07.04.2021

# CO-PO ATTAINMENT

**ADAMAS UNIVERSITY, KOLKATA**
**SCHOOL OF ENGINEERING AND TECHNOLOGY**
**DEPARTMENT OF CIVIL ENGINEERING**
**CO-PO ATTAINMENT**

| Programme : | M.Tech (Environmental Engineering) | Year & Sem: | I & I | Academic Year: | 2020-21 | Batch: 2020-22 |
|---|---|---|---|---|---|---|

| Course Code | Course Name | CO-PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ECE61107 | Air and Noise Pollution | Relationship | CO1, CO2, CO3 | CO3, CO4 | CO3, CO4 | CO2, CO3, CO4 | CO1, CO2 | CO4 | CO1, CO2 | CO4 | CO1, CO2, CO3 |
| | | Mapping Value | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 |
| | | Attainment | 2.94 | 1.92 | 1.92 | 1.94 | 1.98 | 1.92 | 0.99 | 0.96 | 1.96 |

Year: I

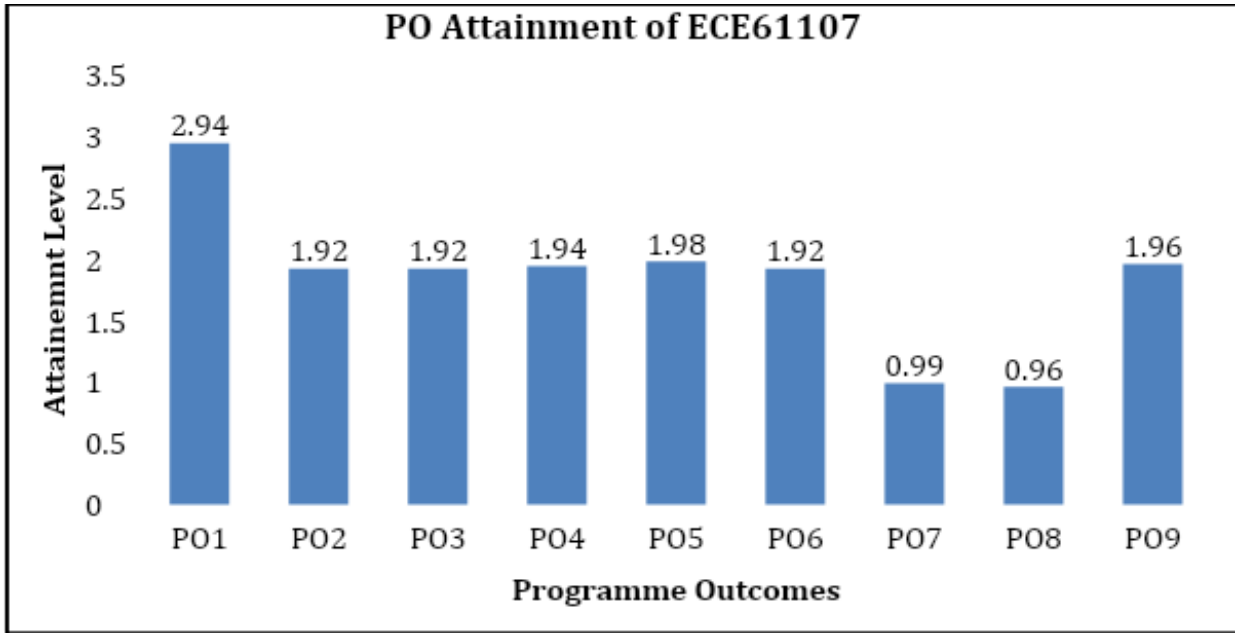
Semester: I

1. Name of the Faculty: Jayanta Nath Chowdhury — Course Code: ECE61107
2. Course : Air and Noise Pollution — L: 3
3. Program : M.Tech (Environmental Engineering) — T: 1
4. Target : 60% — P: 0
C: 4

**Signature of HOD/Dean** **Signature of Faculty**

**Date: 07.04.2021** **Date: 07.04.2021**

## PO ATTAINMENT OF THE COURSE




**Signature of HOD/Dean** **Signature of Faculty**

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

**Date: 07.04.2021** **Date: 07.04.2021**

**Year: I**

**Semester: I**

**1. Name of the Faculty: Jayanta Nath Chowdhury** **Course Code: ECE61107**

**2. Course : Air and Noise Pollution** **L: 3**

**3. Program : M.Tech (Environmental Engineering)** **T: 1**

**4. Target : 60%** **P: 0**

**C: 4**

# INSTRUCTIONS FOR FACULTY

**Instructions for Faculty**

- Faculty should keep track of the students with low attendance and counsel them regularly.
- Course coordinator will arrange to communicate the short attendance (as per University policy) cases to the students and their parents monthly.
- Topics covered in each class should be recorded in the table of RECORD OF CLASS TEACHING (Suggested Format).
- Internal assessment marks should be communicated to the students twice in a semester.
- The file will be audited by respective Academic Monitoring and Review Committee (AMRC) members for theory as well as for lab as per AMRC schedule.
- The faculty is required to maintain these files for a period of at least three years.
- This register should be handed over to the head of department, whenever the faculty member goes on long leave or leaves the Colleges/University.
- For labs, continuous evaluation format (break-up given in the guidelines for result preparation in the same file) should be followed.
- Department should monitor the actual execution of the components of continuous lab evaluation regularly.
- Instructor should maintain record of experiments conducted by the students in the lab weekly.
- Instructor should promote students for self-study and to make concept diary, due weightage in the internal should be given under faculty assessment for the same.
- Course outcome assessment: To assess the fulfilment of course outcomes two different approaches have been decided. Degree of fulfillment of course outcomes will be assessed in different ways through direct assessment and indirect assessment. In Direct Assessment, it is measured through quizzes, tests, assignment, Mid-term and/or End-term examinations. It is suggested that each examination is designed in such a way that it can address one or two outcomes (depending upon the course completion). Indirect assessment is done through the student survey which needs to be designed by the faculty (sample format is given below) and it shall be conducted towards the end of course completion. The evaluation of the achievement of the Course Outcomes shall be done by analyzing the inputs received through Direct and Indirect Assessments and then corrective actions suggested for further improvement.
- **Submission Targets of Course Contents:**
  - **S. No. 1 to 8 : Before Starting the Course**
  - **S. No. 9 & 10 : After Mid Semester Examination**
  - **S. No. 11 to 18 : Immediately After End Semester Examination**
  - **S. No. 19 to 22 :After Declaration of Result of the Course**