Universidad Carlos III de Madrid
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| COURSE: Acoustical instrumentation and noise control | | |
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| DEGREE: Bachelor in Audiovisual System Engineering. | YEAR: 4th | TERM: 2 |

*La asignatura tiene 29 sesiones que se distribuyen a lo largo de 14 semanas. Los laboratorios pueden situarse en cualquiera de ellas.*
*Semanalmente el alumnos tendrá dos sesiones, excepto en un caso que serán tres*

| WEEKLY PLANNING | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| WEEK | SESSION | DESCRIPTION | GROUPS (mark X) | | SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room) | Indicate YES/NO If the session needs 2 teachers | WEEKLY PROGRAMMING FOR STUDENT | | |
| | | | LECTURES | SEMINARS | | | DESCRIPTION | CLASS HOURS | HOME WORK HOURS (Max. 7h week) |
| 1 | 1 | **Subject presentation.** <br><br> **Lesson 1:** **Acoustical instrumentation. Sensors. Measurement microphones.** <br><br> - Design of measurement microphones. Characteristics of measurement microphones. | X | | | | - Review about mechanical and acoustic systems. <br><br> - Readings to be determined | 1,6 | 5 |

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|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | - Exercises. | | X | | | - Exercises to be determined. | 1,6 | |
| 2 | 3 | - Classification of measurement microphones.<br>- Sound intensity probes. | X | | | | - Readings to be determined.<br><br>- Study of the concepts shown in the theoretical classes. | 1,6 | |
| 2 | 4 | - Exercises. | | X | | | - Exercises to be determied. | 1,6 | 4.5 |
| 3 | 5 | **Lesson 2: Sound sources: power and omni-directionality criteria. Tapping machine.**<br><br><br>- Types of acoustical sources.<br>- Measurement of omni-directionality and power. | X | | | | - Readings to be determined.<br><br>- Study of the concepts shown in the theoretical classes. | 1,6 | |
| 3 | 6 | - Exercises. | | X | | | - Exercises to be determined. | 1,6 | 4.5 |
| 4 | 7 | - Coverage of directional sources.<br>- Requirements of tapping machines. | X | | | | - Readings to be determined.<br><br>- Study of the concepts shown in the theoretical classes. | 1,6 | |
| 4 | 8 | - Exercises. | | X | | | - Exercises to be determined. | 1,6 | 5 |
| 5 | 9 | **Lesson 3: Sound level meters and acoustic analyzers.**<br><br>- Basic structure of sound level meters. | X | | | | - Readings to be determined.<br><br>- Study of the concepts shown in the theoretical classes. | 1,6 | 6 |

| | | | | X | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 10 | - Exercises. | | X | | | | - Exercises to be determined. | 1,6 |
| 6 | 11 | - Characteristics of sound level meters and acoustic analyzers.<br>- Metrological classification and normative. | X | | | | | - Readings to be determined.<br><br>- Study of the concepts shown in the theoretical classes. | 1,6 |
| 6 | 12 | - Exercises. | | X | | | | - Exercises to be determined. | 1,6 |
| | | | | | | | | | 5 |
| 7 | 13 | **Lesson 4: Noise types. Airborne noise. Impact noise. Vibrations.**<br><br>- Propagation of airborne noise. | X | | | | | - Readings to be determined.<br><br>- Study of the concepts shown in the theoretical classes. | 1,6 |
| 7 | 14 | - Exercises. | | X | | | | - Exercises to be determined. | 1,6 |
| | | | | | | | | | 5 |
| 8 | 15 | - Propagation of impact noise.<br>- Measurement of vibrations. | X | | | | | - Readings to be determined.<br><br>- Study of the concepts shown in the theoretical classes. | 1,6 |
| 8 | 16 | - Exercises. | | X | | | | - Exercises to be determined. | 1,6 |
| | | | | | | | | | 5 |
| 9 | 17 | **Lesson 5: Noise measurement parameters. Current regulations.** | X | | | | | - Readings to be determined. | 1,6 |
| | | | | | | | | | 4.5 |

| Week | Session | Content | Theory | Exercises | Laboratory | | Homework | Hours | |
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| | | - Equivalent noise level.<br>- Evaluation level. Penalties. | | | | | - Study of the concepts shown in the theoretical classes. | | |
| 9 | 18 | - Exercises. | | X | | | - Exercises to be determined. | 1,6 | |
| 10 | 19 | - RD 1367.<br>- Regional regulations.<br>- | X | | | | - Readings to be determined.<br><br>- Study of the concepts shown in the theoretical classes. | 1,6 | |
| 10 | 20 | - Exercises. | | X | | | - Exercises to be determined. | 1,6 | 5 |
| 11 | 21 | **Lesson 6: Noise control techniques. Passive techniques. Acoustic filters. Acoustic silencers. Acoustic barriers.**<br><br>- Evaluation parameters for noise control.<br>- Acoustic filter design. | X | | | | - Readings to be determined.<br><br>- Study of the concepts shown in the theoretical classes. | 1,6 | |
| 11 | 22 | - Exercises<br>- | | X | | | - Exercises to be determined. | 1,6 | 6.5 |
| 12 | 23 | - Acoustic silencer design.<br>- Acoustic barriers study. | X | | | | - Readings to be determined.<br><br>- Study of the concepts shown in the theoretical classes. | 1,6 | |
| 12 | 24 | - Lab exercice 1: sound analyzers | | | Laboratory 7.1.J.10 | | - Complementary Readings to be determined. | 1,6 | 6 |
| 13 | 25 | **Lesson 6: Noise control techniques. Passive techniques. Acoustic filters. Acoustic silencers. Acoustic barriers.**<br><br>- Evaluation parameters for noise control.<br>- - Acoustic filter design. | X | | | | | 1,6 | |
| 13 | 26 | - Lab exercice 2: sound power measurement | | | Laboratory 7.1.J.10 | | | 1,6 | 6 |
| 14 | 27 | - Limitations.<br>- Algorithms based on adaptive filtering. | X | | | | | 1,6 | 3 |
| 14 | 28 | 3<br>- Lab exercice 3: environmental noise measurement | | | Laboratory 7.1.J.10 | | | 1,6 | 3 |
| | 29 | - Lab exercice 4: acoustic sound insulation measurement | | | Laboratory 7.1.J.10 | | | 1,6 | 3 |
| **Subtotal 1** | | | | | | | | **48,33** | **80** |

| **Total 1** *(Hours of class plus student homework hours between weeks 1-14)* | |
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| 15 | | Tutorials, handing in, etc | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 16 | | | | | | | | | |
| 17 | | Assessment | | | | | | 3 | |
| 18 | | | | | | | | | |
| | | | | | | | **Subtotal 2** | **3** | |

| Total 2 *(Hours of class plus student homework hours between weeks 15-18)* | |
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| **TOTAL** *(Total 1 + Total 2. Maximum 180 hours)* | |
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