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| **tFaculty:** Engineering Technology | |
| **Program:** BSc Architectural Eng. | **Department:** Architecture |
| **Semester:** Second | **Academic year:** 2024/2025 |

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**Course Plan**

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| **First: Course Information** |

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| ***Practical: 0*** | ***Theoretical: 3*** | ***Credit Hours: 3*** | | ***Course Title: Illumination and Acoustics*** | | ***Course No.: 0908423*** |
| ***Lecture Time: 11-12 Mon, Wend, Sat*** | | | ***Section No.: 1*** | | ***Prerequisite No. and Title: 0908321 Architectural Design 3*** | |
| ***7*** | | | | | | ***Level in JNQF*** |
| ***Obligatory University Requirement Elective University Requirement***  ***Obligatory Faculty Requirement Elective Faculty Requirement***  ***Obligatory Specialization Requirement Elective Specialization Requirement***  ***Ancillary course*** | | | | | | ***Type Of Course:*** |
| ***Face-to-Face Learning***  ***Blended Learning (2 Face-to-Face + 1 Asynchronous)***  ***Online Learning (2 Synchronous+ 1 Asynchronous)*** | | | | | | ***Type of Learning:*** |

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| **Second: Instructor’s Information** |

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| ***Course Coordinator:*** | | | |
| ***Academic Rank: Assistant Professor*** | | ***Name: Dalia Al-Tarazi*** | |
| ***Email: daltarazi@zu.edu.jo*** | ***Extension Number: 2105*** | ***Office Number: 324L*** | |
| ***Course Instructor:*** | | | |
| ***Academic Rank: Assistant Professor*** | | ***Name: Dr Dalia Al-Tarazi*** | |
| ***Email: daltarazi@zu.edu.jo*** | ***Extension Number: 2105*** | ***Office Number: 324L*** | |
| ***Sunday Monday Tuesday Wednesday Thursday***  ***12-1 12-1 11-12*** | | | ***Office Hours:*** |

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| **Third: Course Description** |

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| This course studies the physical characteristics of the light and its main principles, the light calculations, natural and artificial lighting design principles and its implementation in architecture. It provides full understanding of the physical characteristics of acoustics and its main principles. Study acoustics resources inside the buildings, measure acoustics levels, and acoustics design principles in building, acoustics control and isolation. Introduce the student to measurement tools and materials that are used in the practical implementations for the illumination and acoustics fields of architecture. |

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| **Fourth: Course objectives** |

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| 1. be able to integrate acquired knowledge with other interdisciplinary topics in architecture  2. be able to identify urban noise sources and factors and propose the technical solutions related to such problems.  3. be able to reevaluate the acoustics quality of problematic architectural space and to resolve those problems via technical acoustics solutions.  4. be able to apply the acquired knowledge of illumination to architectural environments, both design and reevaluation and diagnosing lighting problems. |

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| **Fifth: Learning Outcomes** |

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| ***Assessment method*** | ***Associated PILOs Code***  *Choose one PILO for each CILO\** | ***CILOs***  If any CLO will not be assessed in the course, mark NA. | ***CILOs Code*** | ***Level descriptor according to (JNQF)*** |
| Midterm exam, weekly assignments, final exam | **PK1** | Describe the principles of light perception and the interaction between light, vision, and architectural spaces based on photometric and perceptual factors | **K1** | **Knowledge** |
| weekly assignments, final exam | **PK1** | Explain the fundamental concepts of sound behavior, psychoacoustics, and their impact on building acoustics and occupant experience | **K2** |
| Midterm exam, weekly assignments, final exam | **PS1** | Apply lighting equations to calculate illuminance, luminance, luminous flux, and other photometric values to solve architectural lighting design problems | **S1** |
| weekly assignments, final exam | **PS1** | Apply acoustic design principles to optimize speech intelligibility, noise control, and material selection in different architectural contexts | **S2** |
| Midterm exam, weekly assignments, final exam | **PC2** | Formulate innovative lighting and acoustic design solutions that integrate perceptual, functional, and sustainability principles in architectural practice | **C1** | **Competencies** |

\*CILOs: Course Intended Learning Outcomes; PILOs: Program Intended Learning Outcomes; For each CILO, the PILO could be the same or different.

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| **Sixth: Learning Resources** |

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| ***The Architecture of Light*** | | | | ***Main Reference:*** |
| ***Publication Year: 2012*** | ***Print: 1*** | ***Issue No.: 2*** | ***Author: Sage Russel*** | |
| ***Architectural acoustics illustrated*** | | | | ***Main Reference:*** |
| ***Publication Year: 2015*** | ***Print: 1*** | ***Issue No.: 1*** | ***Author: Ermann, Michael*** | |
| * ***All class notes*** * ***Moodle assignments/ resources*** | | | | ***Additional Sources &Websites:*** |
| ***Classroom Laboratory Workshop MS Teams Moodle*** | | | | ***Teaching Type:*** |

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| **Seventh: Course Structure** |

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| **Lecture Date** | **Course Intended Teaching Outcomes**  **(CILOs)** | **Topics** | **Teaching Procedures\*** | **Teaching Methods\*\*** | **References\*\*\*** |
| 03.03.2025 | K1, K2 | Introduction toIllumination and  Acoustics | Face-to-Face | Lecture | Textbook Ch1 |
| 05.03.2025 | K1 | What is light? Its properties, light wave and speed.  The terms used in lighting: Luminous flux, lumen, luminous intensity, candela | Face-to-Face | Lecture | Textbook Ch2 |
| 08.05.2025 | K1 | Activity No. 1 | asynchronous | Assignment | Textbook Ch1+2 |
| 10.03.2025 | K1 | Illuminates, Lux,  Luminous, reflection of light, colour rendering | Face-to-Face | Lecture | Textbook Ch3+4 |
| 12.03.2025 | K1 | Colour temperature, how we describe colours. Building code and criteria of different lighting levels for different spaces in buildings | Face-to-Face | Lecture | Textbook Ch5 |
| 15.03.2025 | K1 | Activity No. 2 | asynchronous | Assignment | Textbook Ch3+4+5 |
| 17.03.2025 | K1 | Human eyes, light and sight, main factors affecting human sight. | Face-to-Face | Lecture | Textbook Ch6+7 |
| 19.03.2025 | K1, S1 | Light sources, sun, tungsten lamps, fluorescent,  mercury and sodium lamps, LED lamps. Their  characteristics, where the best use of these lamps | Face-to-Face | Lecture | Textbook Ch8 |
| 22.03.2025 | K1, S1 | Activity No.3 | asynchronous | Assignment | Textbook Ch8 |
| 24.03.2025 | K1, S1 | Day lightings: Advantages of day lightings, design  procedure of day lighting in buildings | Face-to-Face | Lecture | Textbook Ch9+10 |
| 26.03.2025 | K1, S1 | General recommendation of using day lighting in buildings and general roles | Face-to-Face | Lecture | Textbook Ch11 |
| 29.03.2025 | S1 | Activity No.4 | asynchronous | Assignment | Textbook Ch11 |
| 31.03.2025 | -------------- | Official Holiday | ----------- | -------------- | Textbook |
| 02.04.2025 | -------------- | Official Holiday | ----------- | -------------- | Textbook |
| 05.04.2025 |  | Activity No.5 | asynchronous | Assignment | Textbook Ch10+11 |
| 07.04.2025 | S1 | Artificial lighting  calculation | Face-to-Face | Lecture | Textbook Ch112 |
| 09.04.2025 | S1 | Day lighting calculation | Face-to-Face | Lecture | Textbook Ch13 |
| 12.04.2025 | S1 | Activity No.6 | asynchronous | Assignment | Textbook Ch112+13 |
| 14.04.2025 | K2 | What is sound? Its properties, sound waves and speed | Face-to-Face | Lecture | Textbook Ch14+15 |
| 16.04.2025 | K2 | sound pressure, and sound pressure level | Face-to-Face | Lecture | Textbook Ch16 |
| 19.04.2025 | K2 | Activity No.7 | asynchronous | Assignment | Textbook Ch16 |
| 21.04.2025 | K2 | sound power, and sound power level, dB & dBA | Face-to-Face | Lecture | Textbook Ch17 |
| 23.04.2025 | K2 | sound power, and sound power level, dB & dBA | Face-to-Face | Lecture | Textbook Ch18 |
| 26.04.2025 | K2 | Activity No.8 | asynchronous | Assignment | Textbook Ch17+18 |
| **28.04.2025** | K1, K2, S1 | **Mid Exam** | Face-to-Face | Lecture | Textbook |
| 30.04.2025 | K2 | Human ears | Face-to-Face | Lecture | Textbook Ch19 |
| 03.05.2025 | K2 | Activity No.9 | asynchronous | Assignment | Textbook Ch19 |
| 05.05.2025 | K2, S2 | sound propagation in free field conditions and indoors | Face-to-Face | Lecture | Textbook Ch20 |
| 07.05.2025 | K2, S2 | sound propagation in free field conditions and indoors | Face-to-Face | Lecture | Textbook Ch20 |
| 10.05.2025 | K2, S2 | Activity No.10 | asynchronous | Assignment | Textbook Ch20 |
| 12.05.2025 | S2 | reverberation time, absorption coefficient | Face-to-Face | Lecture | Textbook Ch1 |
| 14.05.2025 | S2 | reverberation time, absorption coefficient | Face-to-Face | Lecture | Textbook Ch1 |
| 17.05.2025 | K2, S2 | Activity No.11 | asynchronous | Assignment | TextbookCh1 |
| 19.05.2025 | K2, S2 | Sound insulation | Face-to-Face | Lecture | Textbook Ch1 |
| 21.05.2025 | K2, S2 | Sound insulation | Face-to-Face | Lecture | Textbook Ch1 |
| 24.05.2025 | K2, S2 | Activity No.12 | asynchronous | Assignment | Textbook Ch2 |
| 26.05.2025 | S2 | Background noise criteria | Face-to-Face | Lecture | Textbook Ch2 |
| 28.05.2025 | S2 | Background noise criteria | Face-to-Face | Lecture | Textbook Ch2 |
| 31.05.2025 | S2 | Activity No.13 | asynchronous | Assignment | Textbook Ch3 |
| 02.06.2025 | S2 | Building code and criteria of different noise level | Face-to-Face | Lecture | Textbook Ch3 |
| 04.06.2025 | S2 | Building code and criteria of different noise level | Face-to-Face | Lecture | Textbook Ch3 |
| 07.06.2025 | -------------- | Official Holiday | asynchronous | Assignment | Textbook |
| 09.06.2025 | C1 | Illumination & Acoustics applications | Face-to-Face | Lecture | Textbook |
| 11.06.2025 | C1 | Illumination & Acoustics applications | Face-to-Face | Lecture | Textbook |

\*Teaching procedures: (Face-to-Face, synchronous, asynchronous). \*\* Teaching methods: (Lecture, video….).

\*\*\* Reference: (Pages of the book, recorded lecture, video….)

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| **Eighth: Assessment Methods** |

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| **Methods** | **Online Learning** | **Blended Learning** | **Face-To-Face**  **Learning** | **Specific Course Output to be assessed**  \*\*If any CILO will not be assessed in the course, mark NA. | | | | |
| **K1** | **K2** | **S1** | **S2** | **C1** |
| **First Exam** |  |  |  |  |  |  |  |  |
| **Second Exam** |  |  |  |  |  |  |  |  |
| **Mid-term Exam** |  | **30** |  | **15** |  | **5** |  | **10** |
| **Participation** |  |  |  |  |  |  |  |  |
| **Asynchronous Activities** |  | **20** |  |  |  | **7** | **7** | **6** |
| **Quizzes** |  |  |  |  |  |  |  |  |
| **Assignments** |  |  |  |  |  |  |  |  |
| **Group presentation** |  |  |  |  |  |  |  |  |
| **Final Exam** |  | **50** |  |  | **15** | **10** | **15** | **10** |
| **Total out of 100** |  | **100** |  | **15** | **15** | **22** | **22** | **26** |

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| **Ninth: Course Policies** |

* All course policies are applied on all teaching patterns (online, blended, and face-to-face Learning) as follows:

1. Punctuality.
2. Participation and interaction.
3. Attendance and exams.

* Academic integrity: (cheating and plagiarism are prohibited).

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| **Approval** | **Name** | **Date** | **Signature** |
| **Head of Department** | Dr Dalia Al-Tarazi | 03/03/2025 |  |
| **Faculty Dean** | Dr Abdullah Khatib | 03/03/2025 |  |