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| **Date:** | Examination No.: | Version:2021-2022 | Start:16/01/2024 |
| **Module Name - Code** | **Building Technology** |
| **Module Language:** | English |
| **Responsible:** | **Dr. Hardi K. Abdullah** |
| **Lecture (s):** | **Assist. Lec. Faten R. Yasin** |
| **College:** | College of Engineering – Salahaddin University-Erbil |
| **Duration:** | 15 weeks – 1 semester (spring) |
| **Course outcomes:** | The course aims at providing a fundamental understanding of the **physics and technologies related to buildings** and to propose an overview of the various issues that have to be adequately combined **to offer the occupants a physical, functional and psychological well-being**. Students will be guided through the different components, constraints and systems of a work of architecture. These will be examined both independently and in the manner in which they interact and affect one another.The course serves both as an introduction to the physical processes lying behind the design of the building envelope, interior and equipment, and as an initiation for a proper integration of technology in architecture. |
| **Course Content:** | • information technology in buildings,• the software used to design them, and• new technologies in building systems.Design concepts and technologies to create buildings that **contribute to a more humane and environmentally responsible built world**. Strategies employed toward these ends include: • integrated architectural design strategies, • resource accounting through material flow analysis and life cycle assessment, • structural design and optimization, • building and urban energy modeling and simulation, • human comfort analysis, • control design and engineering, • technologically-informed design methods. • low-energy and passive building energy strategies, • performance-driven computational design approaches, and • various issues of energy and material resources at the urban scale**Schedule of Lectures**The schedule listed on this page is tentative and may change during the term.

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| **Week** | **Date** | **Lecture Topics** |
| Week 1 | 13.2.2024 | Coursebook description |
| Week 2 | 20.2.2024 | Introduction to Building Technology |
| Week 3 | 27.2.2024 | Construction technologies, Material Technologies and Design technologies |
| Week 4 | 5.3.2024 | Holiday |
| Week 5 | 12.3.2024 | Holiday |
| Week 6 | 19.3.2024 | Architecture in the Digital age: Design and manufacturing  |
| Week 7 | 26.3.2024 | Mid-term Exam |
| Week 8 | 2.4.2024 | Digital fabrication, Interactive and responsive designs |
| Week 9 | 9.4.2024 | Parametric design, generative design, and algorithmic design |
| Week 10 | 16.4.2024 | Building Integrated Photovoltaics (BIPV) |
| Week 11 | 23.4.2024 | Folding design techniques  |
| Week 12 | 30.4.2023 | Performance-based design, simulation and optimization |
| Week 13 | 7.5.2024 | Bio-inspired design and review of lectures |
| Week 14 | 14.5.2024 | Final Exam |

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| **Literature:** | • Szokolay, Steven. Introduction to Architectural Science: The Basis of Sustainable Design. Burlington, MA: Architectural Press, 2004. ISBN: 9780750658492.• Deplazes, Andrea. Constructing Architecture. Basel, Switzerland: Birkhäuser, 2006. ISBN: 9783764371890.• Ching, Francis D. K., and Cassandra Adams. Building Construction Illustrated. New York, NY: John Wiley & Sons, 2000. ISBN: 9780471358985.• Allen, Edward, and David Swoboda. How Buildings Work: The Natural Order of Architecture. New York, NY: Oxford University Press, 2005. ISBN: 9780195161984.• Allen, Edward, and Joseph Iano. Fundamentals of Building Construction: Materials and Methods. New York, NY: John Wiley & Sons, 2003. ISBN: 9780471219033.• Lechner, Norbert. Heating, Cooling, Lighting: Design Methods for Architects. New York, NY: John Wiley & Sons, 2000. ISBN: 9780471241430. |
| **Type of Teaching:** | 4 hours (2 hours theoretical and 2 hours practical) |
| **Pre-requisites:** | None |
| **Preparation Modules:** | Environment and Sustainability |
| **Frequency:** | Spring Semester  |
| **Requirements for credit points:** | For the award of credit points, it is necessary to pass the module set presentations and exams. It contains:The module has weekly works, assignments, pre final and final presentations for the required project set.**Student's attendance is required in all classes**. |
| **Credit point:** | 4 |
| **Grade Distribution:** | Assignments include problem sets and field studies. The design project includes energy, thermal, lighting and acoustic assessments of an existing building as well as an analysis of its architectural design considerations and construction method. The buildings are selected at the beginning of the semester by the students in teams of 3. Short written reports are due for each analysis.**Grading Method:**

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| **Task/ activity** | **Percentage (%)** |
| Seminar, quiz and attendance | 15 |
| Mid-term exam | 10 |
| Project | 15 |
| Final exam | 60 |

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| **Work load:** | The workload is 110 hrs. It is the result of 60 hrs. attendance and 50 hrs. self-studies (Assignments, preparation for project set and applications). |