



**In the name of God. All praise is due to Allah. The lord of the
worlds. The Beneficent the Merciful.**

Course Plan: Energy Modeling

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| Unit/Topic | Energy Modeling |
| Date | Based on education department |
| Level | MSc (Master of Science) |
| Department | Agricultural Machinery and Mechanization |
| University | Agricultural Sciences and Natural Resources University of Khuzestan |
| Educator | Morteza Taki (PhD) |

Timetable and topics for teaching and evaluation

| Topic | Session |
|---|----------------|
| Introduction | Week 1 |
| Introduction to heat transfer (Conduction) | Week 2 |
| Introduction to heat transfer (Convection) | Week 3 |
| Introduction to heat transfer (Radiation) | Week 4 |
| Sun and Its Component (latitude and Longitude, Calculation the solar radiation on a flat surface) | Week 5 |
| Solar collectors (Flat plate) | Week 6 |
| Solar collectors (Solar Furnaces) | Week 7 |
| (PC, FR, PDR collectors) | Week 8 |
| Solar collectors (Heliostat and spherical Collectors) | Week 9 |
| Solar Cells (Introduction-P-N connection) | Week 10 |
| Solar Cells (Type of solar cells, Application of solar cells) | Week 11 |
| Solar Cells (Solar trackers, Structures of solar cell power plant) | Week 12 |
| principles of solar photovoltaic systems design | Week 13 |
| Solar greenhouses (Energy storage and loss reduction in greenhouses) | Week 14 |
| Energy in Agriculture (Part 1) | Week 15 |
| Energy in Agriculture (Part 2) | Week 16 |

Evaluation

| Method | Date | Point |
|---------------|-------------------------------|--------------|
| Presentation | Based on the timetable | 0-2 |
| Final exam | Based on education department | 18-20 |

References

۱. ثقفی، محمود. انرژی‌های تجدیدپذیر. ۱۳۹۶. انتشارات دانشگاه شاهد تهران.
۲. محمود، لایقی. انرژی خورشیدی (فناوری‌ها و کاربردها جلد اول). ۱۳۹۵. انتشارات جهاد دانشگاهی دانشگاه تهران
3. A, Labouret and M, Villoz. 2015. Solar photovoltaic Energy. Springer
4. A.R., Jha. 2017. Solar cell technology and Applications. CRC Press

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| Educator: Morteza Taki (PhD) | The head of Department: Mahmoud Ghaseminejad Raeini (PhD) |
| <i>Morteza Taki</i> | |