# 11th Training Course: Renewable and Sustainable Energies

**Universidad Complutense de Madrid**
**Moncloa Campus (Ciudad Universitaria), Faculty of Physics**

**November 2026**

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| Thursday, November 19th | | | |
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| **Time** | **Room** | **Lecturers** | **Topics** |
| 9h00 - 9h30 | 4B<br>(ground floor) | | **Welcome and introduction** |
| 9h30 - 11h45 | 4B<br>(ground floor) | Dr. Ana Negredo | **An introduction to geothermal energy: the geophysical and geodynamic basis**<br>An overview of the physical fundamentals for geothermics. The different temporal and spatial scales of heat flow and geodynamic controls. |
| 11h45 - 12h15 | Sala de profesores<br>(faculty room, 1st floor) | Coffee break | |
| 12h15 - 14h30 | 4B<br>(ground floor) | Dr. Jorge Contreras<br>Dr. Loreto García | **Solar thermal energy: fundamentals, technologies and applications**<br>Fundamentals of solar thermal energy, main technologies and components, energy storage, practical demonstrations, applications and industry trends. |

| Friday, November 20th | | | |
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| **Time** | **Room** | **Lecturers** | **Topics** |
| 9h00 - 11h15 | 13<br>(ground floor) | Dr. Luis Durán | **Solar resource assessment**<br>Physical basics of the solar resource, measurement and evaluation of the solar resource, solar constant, spectral distribution, atmospheric absorption, attenuation of the resource, local effects. |
| 11h15 - 11h45 | Sala de profesores<br>(faculty room, 1st floor) | Coffee break | |
| 11h45 - 14h00 | 13<br>(ground floor) | Dr. Juan José Ledo | **Integrated geothermal exploration: electromagnetic methods, hydrothermal alteration, and case studies**<br>A comprehensive guide to 3D resistivity imaging, hydrothermal alteration modeling, and field case studies in volcanic and EGS environments. |

| Monday, November 23rd | | | |
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| **Time** | **Room** | **Lecturers** | **Topics** |
| 9h00 - 11h15 | 4B<br>(ground floor) | Dr. Javier Fullea | **Lithospheric structure and geothermal energy**<br>Geophysical-petrological lithospheric geothermal modelling integrating seismic and borehole data constraints, the role of mantle heat and crustal thermophysical properties in the prediction of the near surface geotherm. |
| 11h15 - 11h45 | Sala de profesores<br>(faculty room, 1st floor) | Coffee break | |
| 11h45 - 14h00 | 4B<br>(ground floor) | Dr. Eric García<br>Dr. Enrique San Andrés | **Solar photovoltaic energy: devices**<br>Introduction to solar photovoltaic energy. Photovoltaic devices. Materials and manufacturing techniques of solar cells. High efficiency devices and outlook. |

| Friday, November 27th | | | |
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| **Time** | **Room** | **Lecturers** | **Topics** |
| 9h00 - 11h15 | 13<br>(ground floor) | Dr. Eric García<br>Dr. Enrique San Andrés | **Solar photovoltaic energy: systems and modules**<br>Components of a photovoltaic system. Photovoltaic modules: simple panel model. Inverters. Photovoltaic installations. |
| 11h15 - 11h45 | Sala de profesores<br>(faculty room, 1st floor) | Coffee break | |
| 11h45 - 14h00 | 13<br>(ground floor) | Dr. Naeim Mousavi | **AI in geothermal energy assessment**<br>AI-based global geothermal heat-flow mapping: feature selection, prediction, and uncertainty for geothermal resource assessment. |
| 14h00 - 15h00 | 13<br>(ground floor) | | **Closing remarks and<br>presentation of attendance certificates** |