**Energy Transition @ IST – Year 2**

At IST Energy Transition students can choose among the following specializations:

1. Fuels
2. Renewable Energy
3. Energy Efficiency

Independently from the chosen specialization all students will attend the following curricular units:

Mandatory (all Specializations)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Curricular Units | ECTS | Type | Sem. | Field |
| Decision Support Models  | 6,0 | Common | 2 | Business |
| Master thesis | 30 | Dissertation | 1/2 | Expert/Behavioural/Business |

1. For a specialization in Fuels students can choose among the following curricular units (limitations may apply):

Specialized - Fuels

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| --- | --- | --- | --- | --- |
| Curricular Units | ECTS | Type | Sem. | Field |
| Biofuels | 6,0 | Speci. | 1 | Expert |
| Combustion | 6,0 | Speci. | 2 | Expert |
| Alternative Fuels  | 6,0 | Speci. | 2 | Expert |
| Process Synthesis and Integration | 6,0 | Speci. | 2 | Expert |
| Oil and Gas | 6,0 | Speci. | 1 | Expert |
| Stochastic Modelling of Oil Reservoirs | 6,0 | Speci. | 2 | Expert |
| Waste to Energy | 6,0 | Speci. | 1 | Expert |

Complementary - Fuels

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Curricular Units | ECTS | Type | Sem. | Field |
| Air Pollution and Treatment of Gaseous Effluents | 4,5 | Compl. | 2 | Expert |
| Production and Demand of Electric Energy | 6,0 | Compl. | 1 | Expert |
| Industrial Processes Automation | 6,0 | Compl. | 2 | Expert |
| Energy Systems Optimization | 6,0 | Compl. | 2 | Expert |
| Sustainable Development, Energy and Environment | 6,0 | Compl. | 1 | Expert |
| Engineering Management Projects | 6,0 | Compl. | 2 | Behavioural/Business |
| Logistic Management and Operations | 6,0 | Compl. | 2 | Expert/ Business |

B. For a specialization in Renewable Energy students can choose among the following curricular units (limitations may apply):

Specialized – Renewable Energy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Curricular Units | ECTS | Type | Sem. | Field |
| Renewable Energies 1 | 4,5 | Speci. | 1 | Expert |
| Renewable Sources and Distributed Power Generation 1 | 6,0 | Speci. | 2 | Expert |
| Biofuels | 6,0 | Speci. | 1 | Expert |
| Electrical Machines | 6,0 | Speci. | 1 | Expert |
| Power System Network Analysis | 6,0 | Speci. | 1 | Expert |
| Turbomachinery | 6,0 | Speci. | 2 | Expert |
| Electrochemistry and Energy | 6,0 | Speci. | 2 | Expert |
| Hydropower | 6,0 | Speci. | 1 | Expert |
| Photovoltaic Solar Energy | 6,0 | Speci. | 1 | Expert |
| Solar Thermal Energy | 6,0 | Speci. | 1 | Expert |
| Marine Current & Tidal Energy | 6,0 | Speci. | 2 | Expert |
| Wave Energy | 6,0 | Speci. | 2 | Expert |
| Offshore Wind Energy | 6,0 | Speci. | 1/2 | Expert |
| Energy Storage | 6,0 | Speci. | 1 | Expert |
| Hydromineral and Geothermal Resources | 6,0 | Speci. | 2 | Expert |

(1) One of these curricular units is mandatory for students choosing this specialization.

Complementary – Renewable Energy

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| --- | --- | --- | --- | --- |
| Curricular Units | ECTS | Type | Sem. | Field |
| Production and Demand of Electric Energy | 6,0 | Compl. | 1 | Expert |
| Air Pollution and Treatment of Gaseous Effluents | 4,5 | Compl. | 2 | Expert |
| Power Electronics for Renewable Energy  | 6,0 | Compl. | 2 | Expert |
| Industrial Processes Automation | 6,0 | Compl. | 2 | Expert |
| Renewable Energy Resources | 6,0 | Compl. | 2 | Expert |
| Waste to Energy | 6,0 | Compl. | 1 | Expert |
| Energy Systems Optimization | 6,0 | Compl. | 2 | Expert |
| Sustainable Development, Energy and Environment | 6,0 | Compl. | 1 | Expert |
| Engineering Management Projects | 6,0 | Compl. | 2 | Behavioural/Business |
| Logistic Management and Operations | 6,0 | Compl. | 2 | Expert/ Business |
| Energy Services | 6,0 | Compl. | 2 | Expert |

C. For a specialization in Energy Efficiency students can choose among the following curricular units (limitations may apply):

Specialized – Energy Efficiency

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| --- | --- | --- | --- | --- |
| Curricular Units | ECTS | Type | Sem. | Field |
| Pump and Hydropower Systems | 6,0 | Speci. | 2 | Expert |
| Water Resources Modelling and Planning | 6,0 | Speci. | 2 | Expert |
| Process Synthesis and Integration | 6,0 | Speci. | 2 | Expert |
| Indoor Comfort in Buildings | 4,5 | Speci. | 1 | Expert |
| Air-conditioning in Buildings | 6,0 | Speci. | 1 | Expert |
| Built Environments and Impacts | 4,5 | Speci. | 1 | Expert |
| Energy in Transports | 4,5 | Speci. | 1 | Expert |

Complementary – Energy Efficiency

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| --- | --- | --- | --- | --- |
| Curricular Units | ECTS | Type | Sem. | Field |
| Computational Fluid Mechanics | 6,0 | Compl. | 1 | Expert |
| Production and Demand of Electric Energy | 6,0 | Compl. | 1 | Expert |
| Road Traffic Engineering | 4,5 | Compl. | 1 | Expert |
| Industrial Processes Automation | 6,0 | Compl. | 2 | Expert |
| Regions and Networks | 6,0 | Compl. | 1 | Expert |
| Urban Mobility Management | 4,5 | Compl. | 2 | Expert |
| Energy Systems Optimization | 6,0 | Compl. | 2 | Expert |
| Sustainable Development, Energy and Environment | 6,0 | Compl. | 1 | Expert |
| Renewable Energies | 4,5 | Compl. | 1 | Expert |
| Engineering Management Projects | 6,0 | Compl. | 2 | Expert |
| Logistic Management and Operations | 6,0 | Compl. | 2 | Expert |
| Energy Services | 6,0 | Compl. | 2 | Expert |

Students can further choose from a pool of free curricular units independently from the chosen specialization

Free (all Specializations)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Curricular Units | ECTS | Type | Sem. | Field |
| Analysis and Synthesis of Algorithms | 6 | Free | 2 | Expert |
| Project Risk Evaluation and Management | 6,0 | Free | 2 | Expert/ Business |
| Ambient Intelligence | 7,5 | Free | 1 | Expert |
| Embedded Computational Systems | 6,0 | Free | 2 | Expert |
| Economics | 6,0 | Free | 2 | Business |
| Engineering Economics | 6,0 | Free | 1 | Business |
| Commercial & Strategic Management | 6,0 | Free | 2 | Behavioural/Business |
| Marketing Management | 6,0 | Free | 2 | Behavioural/Business |
| Technology Based Entrepreneurship | 7,5 | Free | 1/2 | Business |
| Fundamentals of Operations Research | 6,0 | Free | 2 | Business |
| Seminars on Innovation and Sustainable Development | 4,5 | Free | 1 | Expert |
| Environmental and Sustainability Challenges in Engineering | 1,5 | Free | 1 | Expert |
| Environmental Impacts | 6,0 | Free | 1 | Expert |
| Natural & Technological Risks | 4,5 | Free | 2 | Expert |
| Industrial Safety and Health | 6,0 | Free | 2 | Expert |
| Public Policies for Energy | 6,0 | Free | 1 | Expert |
| Corporate Control and Corporate Governance | 6,0 | Free | 1 | Business |
| Industrial Organization | 6,0 | Free | 1 | Behavioural/Business |
| Free optional | - | - | 1/2 | - |