



HÖGSKOLAN I GÄVLE

Sustainable Power Generation 7.5 cr

Uthållig kraftproduktion 7,5 hp

Set by Faculty of Engineering and Sustainable Development

Version

Set at

Valid from

2/26/18

HT2018

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|----------------------------|--------------------|
| Level | A1N |
| Education level | Second cycle |
| Course identifier | ETA003 |
| Credits | 7.5 cr |
| Main field of study | Energy Systems |
| Subject group | Energy Technology |
| Disciplinary domain | Technology 100.0 % |

Learning outcomes

After completion of the course the student shall be able to

1. describe and explain the principles of various conventional heat and power generation systems
2. present the main components of a power plant
3. describe and explain heat pumps and refrigeration machinery and their components
4. present the possibilities and limitations of heat and power generation systems, in particular with regard to sustainable environment
5. analyse conventional methods for heat and power generation from a systems perspective
6. compare different power generation alternatives and select the most appropriate for given conditions
7. optimise heat and power generation from a thermodynamic perspective
8. evaluate economical aspects of a power plant
9. plan and, using appropriate methods, undertake a project within predetermined time frames
10. in writing report and discuss their conclusions and the knowledge and arguments on which they are based
11. make assessments informed by disciplinary issues related to the course content
12. make assessments informed by economical aspects, environmental and social issues related to the course content.

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| Course content | Power generation systems Fundamental steam power principles Advanced steam power cycles Combined heat and power generation Boilers and combustion Basic gas turbine cycles Advanced gas turbine systems Combined cycles Combustion Compressor driven refrigeration and heat pump systems Absorption cooling systems Nuclear power plants Life-cycle-cost and availability Project work | | | | | | |
| Teaching | Lectures, project work, tasks and lessons | | | | | | |
| Prerequisites | English language proficiency equivalent to (the Swedish upper secondary school) English course 6/B. Completion of Bachelor's degree in technology or natural sciences of at least 180 credits, or equivalent foreign degree, at least 12 credits of which in thermodynamics and fluid mechanics, or equivalent knowledge. | | | | | | |
| Examination | Written examination and project work 0010 Written examination 6 credits examines Learning outcomes 1, 2, 3, 4, 5, 6, 7, 10, 11, grades A-F. 0020 Project Work 1,5 credits examines Learning outcomes 5, 7, 8, 9, 10, grades Pass, Fail. | | | | | | |
| Grade | A, B, C, D, E, Fx, F | | | | | | |
| Other regulations | Degree Criteria for final grade will be given by course responsible or examiner latest at the beginning of the course. | | | | | | |
| Sustainable environment | The majority of the course content deals with sustainable development.. | | | | | | |
| Module | <table border="0" style="width: 100%;"> <tr> <td style="width: 70%;">0010 Written examination</td> <td style="width: 10%; text-align: right;">6 cr</td> <td style="width: 20%; text-align: right;">Grade: AF</td> </tr> <tr> <td>0020 Project Work</td> <td style="text-align: right;">1.5 cr</td> <td style="text-align: right;">Grade: UG</td> </tr> </table> | 0010 Written examination | 6 cr | Grade: AF | 0020 Project Work | 1.5 cr | Grade: UG |
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