

[GAJ203] THERMO-FLUID POWER GENERATION CYCLES

GENERAL INFORMATION

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|------------------|------------------------------|-------------------|-----------------|---|
| Studies | DEGREE IN ENERGY ENGINEERING | | Subject | ? |
| Semester | 1 | Course | 3 | Mention / Field of specialisation |
| Character | COMPULSORY | | Language | ENGLISH |
| Plan | 2022 | Modality | Face-to-face | Total hours |
| Credits | 6 | Hours/week | 2.78 | 50 class hours + 100 non-class hours = 150 total hours |

PROFESSORS

ZARATE LARRINAGA, ENRIQUE

REQUIRED PREVIOUS KNOWLEDGE

| Subjects | Knowledge |
|-----------------|----------------------------------|
| FLUID MECHANICS | (No previous knowledge required) |
| THERMAL ENERGY | |

LEARNING RESULTS

| LEARNING RESULTS | KC | SK | AB | ECTS |
|--|----|----|----|----------|
| GAR309 - Analyzes the efficiency and suitability of different thermodynamic cycles for the design of energy production and cooling systems | | | x | 5,08 |
| G-RTR1 - To develop interdisciplinary projects specific to their specialty and of gradual complexity, - becoming aware of respect for human rights and fundamental rights, and analyzing and assessing the impact of the proposed solutions on the SDGs - to acquire and/or apply basic, advanced and /or avant-garde, demonstrating the ability to work in multidisciplinary teams and/or undertake further studies with a high degree of autonomy | | x | | 0,44 |
| G-RTR2 - To express information, ideas and the arguments that support them in an orderly, clear and coherent manner, orally and in writing, based on quality information, self-made or obtained from different sources, using inclusive and non-discriminatory language | | x | | 0,48 |
| Total: | | | | 6 |

KC: Knowledge or Content / SK: Skills / AB: Abilities

CONTENTS

1. Exergy

–Work potential of energy. Exergy.

–Exergy balance in closed and open systems.

2. Gas Power Cycles

–Joule-Brayton Cycle. Intercooling, reheating and regeneration.

–Jet-propulsion cycle

3. Vapor Power Cycles

–The Carnot Vapor Cycle.

–Rankine Cycle. Reheating and regeneration.

–Cogeneration.

-Combined cycles.

4. Refrigeration Cycles

–Reversed Carnot Cycle.

–The Vapor-Compression Refrigeration Cycle.

5. Humid air

–Specific and relative humidity. Thermal properties of humid air.

–Air conditioning.

–Wet cooling towers.

6. Hydrogen technologies

– Hydrogen production and storage.

– Hydrogen combustion.

– Fuel cells.

7. Heat exchangers

- LMTD and NTU methods.

- Selection of heat exchangers.

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Moodle Platform
Class presentations
Slides of the subject
Specific Master Software

Bibliography

http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in_k.pl?grupo=ENERGIA31&ejecuta=25