

[MRB101] DATA ANALYTICS

GENERAL INFORMATION

| | | | |
|------------------|---|--|---|
| Studies | Master's Degree in ROBOTICS AND CONTROL SYSTEMS | Subject | ? |
| Semester | 1 | Course | 1 |
| Character | COMPULSORY | Mention / Field of specialisation | |
| Plan | 2023 | Modality | Face-to-face |
| Credits | 3 | Hours/week | 0 |
| | | Language | ENGLISH |
| | | Total hours | 29 class hours + 46 non-class hours = 75 total hours |

PROFESSORS

INTXAUSTI ARBAIZA, ENEKO

REQUIRED PREVIOUS KNOWLEDGE

| Subjects | Knowledge |
|--|----------------------------------|
| (No specific previous subjects required) | (No previous knowledge required) |

LEARNING RESULTS

| LEARNING RESULTS | KC | SK | AB | ECTS |
|--|----|----|----|----------|
| M1R208 - Design and implement data preprocessing and modeling techniques to predict, classify and group data, being able to interpret and validate the models created for knowledge extraction. | | x | | 2,4 |
| M1R223 - Ability to work in multidisciplinary teams and in a multilingual environment and to communicate, both orally and in writing, knowledge, procedures, results and ideas related to subjects related to the Master's degree | | x | | 0,2 |
| M1R228 - To communicate your conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way | | x | | 0,4 |
| Total: | | | | 3 |

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

SECONDARY LEARNING RESULTS

RA091 [!] *Reconoce y utiliza conceptos del aprendizaje automático para aplicarlos en el preprocesamiento de datos*

| LEARNING ACTIVITIES | CH | NCH | TH |
|---|--------|------|---------|
| Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams | 2 h. | 5 h. | 7 h. |
| Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints | 1 h. | 5 h. | 6 h. |
| Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects | 4,5 h. | | 4,5 h. |
| Carrying out exercises and solving problems individually and/or in teams | 5,5 h. | 7 h. | 12,5 h. |

| EVALUATION SYSTEM | W | MAKE-UP MECHANISMS |
|--|-----|---|
| Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems | 20% | Individual written and/or oral tests or individual coding/programming tests |
| Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems | 20% | |
| Individual written and/or oral tests or individual coding/programming tests | 60% | |

Comments: All activities (control points, individual and group work, etc.) must have a minimum grade of 5 and an opportunity for recovery (except the PBL). If a control point is not passed (less than a 5), the retake is mandatory and the final grade will be the grade obtained in the retake. If an individual or group work is not passed (less than 5), the retake is mandatory and the final grade will be a maximum of 5. In the activities carried out it is necessary to obtain a minimum mark of 4 to calculate the average mark of the learning result. Otherwise, the note of the learning result will be that of the suspended activity. The system will calculate the final grade with the RA, applying the percentages defined in IKOF.

CH - Class hours: 13 h.

NCH - Non-class hours: 17 h.

TH - Total hours: 30 h.

RA092 [!] *Desarrolla y propone soluciones cuya base sea el análisis de datos utilizando los conceptos del aprendizaje automático comunicando sus conclusiones de manera argumentada en un segundo idioma*

LEARNING ACTIVITIES

| | <i>CH</i> | <i>NCH</i> | <i>TH</i> |
|---|-----------|------------|-----------|
| Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams | 2 h. | 16 h. | 18 h. |
| Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints | 2 h. | 3 h. | 5 h. |
| Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects | 2,5 h. | | 2,5 h. |
| Carrying out exercises and solving problems individually and/or in teams | 9,5 h. | 10 h. | 19,5 h. |

EVALUATION SYSTEM

W

MAKE-UP MECHANISMS

| | | |
|--|-----|---|
| Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems | 20% | Individual written and/or oral tests or individual coding/programming tests |
| Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems | 20% | |
| Individual written and/or oral tests or individual coding/programming tests | 60% | |

Comments: All activities (control points, individual and group work, etc.) must have a minimum grade of 5 and an opportunity for recovery (except the PBL). If a control point is not passed (less than a 5), the retake is mandatory and the final grade will be the grade obtained in the retake. If an individual or group work is not passed (less than 5), the retake is mandatory and the final grade will be a maximum of 5. In the activities carried out it is necessary to obtain a minimum mark of 4 to calculate the average mark of the learning result. Otherwise, the note of the learning result will be that of the suspended activity. The system will calculate the final grade with the RA, applying the percentages defined in IKOF.

CH - Class hours: 16 h.

NCH - Non-class hours: 29 h.

TH - Total hours: 45 h.

CONTENTS

[!]

0 Bases de Python para el análisis de datos

1 Preprocesamiento de datos

1.1 Limpieza

1.2 Transformaciones

1.3 Valores perdidos y valores anómalos

1.4 Selección/extracción/discretización de variables

1.5 Tratamiento de datos desbalanceados

2 Análisis de datos

2.1 Tipos de problemas

a) Clasificación

b) Regresión

c) Agrupamiento

2.2 Familias de modelos

2.3 Selección de modelos

2.4 Validación de modelos

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

- [!] *Apuntes de la asignatura*
- [!] *Artículos de carácter técnico*
- [!] *Consultas en páginas web relacionadas con el tema*
- [!] *Plataforma Moodle*
- [!] *Presentaciones en clase*
- [!] *Realización de prácticas en ordenador*
- [!] *Transparencias de la asignatura*
- [!] *Software específico de la titulación*

Bibliography

http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=MASTERROBOTIKA11&ejecuta=5&_ST