[MMD104] DATA ENGINEERING

GENERAL INFORMATION

Studies	MASTER'S DEGREE IN BIOMEDICAL TECHNOLOGIES			**Subject**	?
Semester	1	**Course**	1	**Mention / Field of specialisation**	???
Character	OPTIONAL				
Plan	2023	**Modality**	Face-to-face	**Language**	ENGLISH
Credits	3	**Hours/week**	2.6	**Total hours**	46.8 class hours + 28.2 non-class hours = **75 total hours**

PROFESSORS

GARITANO GARITANO, IÑAKI

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	*(No previous knowledge required)*

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
MMRA20 - Understanding the process of data intake, storage and display	x			2,1
MMRA26 - To apply the knowledge acquired and your problem-solving skills in new, little-known or changing environments within broader (or multidisciplinary) contexts related to your area of study		x		0,72
MMRA28 - 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		0,18
			Total:	3

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

SECONDARY LEARNING RESULTS

RMM142 **[!]** ***Conoce y comprende las causas y soluciones de la ingeniería de datos masiva***

LEARNING ACTIVITIES	CH	NCH	TH
Computer simulation exercises, individually and/or in teams	10 h.	6 h.	16 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	3 h.	2 h.	5 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Individual written and/or oral tests or individual coding/programming tests	100%	Individual written and/or oral tests or individual coding/programming tests

CH - Class hours: 13 h.
NCH - Non-class hours: 8 h.
TH - Total hours: 21 h.

RMM143 **[!]** ***Conoce y comprende las soluciones de la vanguardia del conocimiento en recolección, ingesta y almacenamiento***

LEARNING ACTIVITIES	CH	NCH	TH
Computer simulation exercises, individually and/or in teams	15 h.	9 h.	24 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	5 h.	2,5 h.	7,5 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Individual written and/or oral tests or individual coding/programming tests	100%	Individual written and/or oral tests or individual coding/programming tests

CH - Class hours: 20 h.
NCH - Non-class hours: 11,5 h.
TH - Total hours: 31,5 h.

RMM144 **[!]** ***Analiza las variables intervinientes en la solución de los problemas y plantea acciones para lograr una situación estable asumiendo responsabilidades en el equipo de trabajo, afrontando contingencias y organizando y planificando tareas.***

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	5,5 h.	3,5 h.	9 h.

EVALUATION SYSTEM	W
Individual written and/or oral tests or individual coding/programming tests	40%
Co-assessment	5%
Prototype / Product	55%

Comments: If the score of the defense is lower than 5, this evaluation item will be evaluated in its entirety (%100) with the score of the defense. A co-evaluation system will be implemented to adjust the score of the student based on his or her participation in the Project.

MAKE-UP MECHANISMS

Observation (technical capacity, attitude and participation)

CH - Class hours: 5,5 h.
NCH - Non-class hours: 3,5 h.
TH - Total hours: 9 h.

RMM145 **[!]** ***Conoce y es capaz de aplicar las herramientas de resolución de problemas en el campo de la Ingeniería Biomédica con iniciativa, toma de decisiones, creatividad y razonamiento crítico.***

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	5,5 h.	3,5 h.	9 h.

EVALUATION SYSTEM	W
Individual written and/or oral tests or individual coding/programming tests	40%
Co-assessment	5%
Prototype / Product	55%

Comments: If the score of the defense is lower than 5, this evaluation item will be evaluated in its entirety (%100) with the score of the defense. A co-evaluation system will be implemented to adjust the score of the student based on his or her participation in the Project.

MAKE-UP MECHANISMS

Observation (technical capacity, attitude and participation)

CH - Class hours: 5,5 h.
NCH - Non-class hours: 3,5 h.
TH - Total hours: 9 h.

RMM146 **[!]** ***Define el problema, el desarrollo de la solución, así como las conclusiones de manera eficaz, argumentando y justificando cada una de ellas, y haciendo un uso correcto del lenguaje, por escrito y de manera oral.***

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	1,5 h.	1 h.	2,5 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory	50%

MAKE-UP MECHANISMS

Observation (technical capacity, attitude and participation)

exercises, term projects, challenges and problems	
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	50%

CH - Class hours: 1,5 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 2,5 h.

RMM147 **[!]** ***Define los objetivos, realiza la planificación para su consecución y su seguimiento sistemático coordinando su trabajo con los demás miembros del equipo.***

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	1,3 h.	,7 h.	2 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	50%
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	50%

MAKE-UP MECHANISMS
Observation (technical capacity, attitude and participation)

CH - Class hours: 1,3 h.
NCH - Non-class hours: ,7 h.
TH - Total hours: 2 h.

CONTENTS

1.- Data engineering concepts

2.- Big Data, definition, evolution and objective

3.- Data engineering challenges

4.- Data sources

5.- Distributed data ingestion

6.- Distributed data storage

7.- Result visualization

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources
Subject notes
Topic related web quires

Bibliography

Kafka [Libro] : the definitive guide: real-time data and stream processing at scale.ISBN: 978-1-4919-3613-9 (online) 978-1-4919-3616-0 (papel) O'Reilly Media, 2017. Neha Narkhede, Gwen Shapira, Todd Palino

Designing data intensive applications : the big ideas behind reliable, scalable, and maintainable systems. Kleppmann, Martin. O'Reilly, 2017. ISBN: 978-1-491-90311-7 (online) 978-1-449-37332-0 (papel)