

MASTER DEGREE IN MATERIALS SCIENCE – SUSTAINABLE MATERIALS – 2020-2021

Dual Degree UNIMIB-KU Leuven

First year at UNIMIB (yellow)

Second year at KU-Leuven (green), to be declared in the Erasmus Learning Agreement)

(blue): equivalent UNIMIB courses not to be attended but to be included in the Plan of Study, according to the Learning Agreement with KU Leuven)

Students must secure at least 12 ECTS by the end of February 2021 and 36 ECTS before the end of September 2021

MANDATORY FUNDAMENTAL-COURSES (36 ECTS)

5 COURSES	TYPE	ECTS	year	SEM
FUNCTIONAL ANALYSIS	SUPPLEMENTARY	6	1	1
SOLID STATE PHYSICS	CORE - Physics and Chemistry	8	1	1-2
PHYSICAL CHARACTERIZATION OF MATERIALS WITH LABORATORY	CORE - Physics and Chemistry	8	1	1-2
THERMODYNAMICS AND KINETICS OF MATERIALS	CORE - Physics and Chemistry	6	1	1
APPLIED PHYSICAL CHEMISTRY WITH LABORATORY	CORE - Physics and Chemistry	8	1	1-2

MANDATORY AREA-COURSES (18 ECTS)

MATERIALS AREA (PHYSICS)

COURSE	TYPE	ECTS	year	SEM
PHYSICS OF HOMOGENEOUS AND NANOSTRUCTURED DIELECTRICS	CORE - Physics and Chemistry	6	1	2

MATERIALS AREA (CHEMISTRY)

COURSE	TYPE	ECTS	year	SEM
PHYSICAL CHEMISTRY OF SOLID STATE AND SURFACES	CORE - Physics and Chemistry	6	1	2

APPLICATIONS AREA (TECHNOLOGY)

COURSE	TYPE	ECTS	year	SEM
LOW ENVIRONMENTAL IMPACT MATERIALS & PROCESSES	CORE - Physics and Chemistry	6	2	1
SUSTAINABLE MATERIALS MANAGEMENT (KU Leuven)		3	2	2
RESOURCE RECOVERY AND RECYCLING (KU Leuven)		3	2	2

MANDATORY APPLICATION-COURSES (12 ECTS)

MATERIALS AREA (APPLICATIONS)

COURSE	TYPE	ECTS	year	SEM
METALS SCIENCE AND SUSTAINABILITY	SUPPLEMENTARY	6	1	1
*BASIC CHEMISTRY FOR MATERIALS SCIENCE	SUPPLEMENTARY	6	1	1
*FUNDAMENTALS OF QUANTUM MECHANICS FOR MATERIALS SCIENTISTS	SUPPLEMENTARY	6	1	1

* students with BSc degrees different from Materials Science who need to fill a gap in physics and/or chemistry can attend these courses. However, these courses cannot be included in the plan of study.

MATERIALS AREA (APPLICATIONS)

COURSE	TYPE	ECTS	year	SEM
MATERIALS AND DEVICES FOR ENERGY ENGINEERING	SUPPLEMENTARY	6	1	1

MANDATORY INNOVATION-COURSE (6 ECTS)

COURSE	TYPE	ECTS	year	SEM
NANOTECHNOLOGY & INNOVATION	CORE - engineering	6	2	1
NANOMATERIALS FOR NANO-ELECTRONICS (KU-Leuven)		3	2	2
ADVANCED CERAMIC MATERIALS (KU-Leuven)		3	2	1

OTHER ACTIVITIES (48 ECTS)

ELECTIVES COURSES	TYPE	ECTS	year	SEM
<i>Suggestions:</i> CHEMISTRY AND TECHNOLOGY OF POLYMERS AND INDUSTRIAL APPLICATIONS (6 ECTS) PHYSICS AND TECHNOLOGY OF ELECTRONIC DEVICES WITH LABORATORY (6 ECTS)	TO BE CHOSEN FREELY BY THE STUDENT (art.10, comma 5, lettera a)	12	1-2	1-2
<i>Suggestions:</i> Management & Strategy (6 ECTS) (KU-Leuven) Mater.Phys.Techn.for Nanoelectr. (6ECTS) (KU-L)		12	2	

	TYPE	ECTS	year	SEM
MASTER THESIS	MASTER THESIS (art.10, comma 5, lettera c)	30	2	1-2
MASTER THESIS AND INTERNSHIP (KU-Leuven)		30	2	

	TYPE	ECTS	year	SEM
LABORATORY OF SCIENTIFIC LANGUAGE/FURTHER LINGUISTIC KNOWLEDGE (3 CFU)	ADDITIONAL TRAINING ACTIVITIES (code F in Table Soft skills)	3	1/2	
PROJECT MANAGEMENT (KU-Leuven)		3	2	2

	TYPE	ECTS	year	SEM
INTERNSHIP (3 CFU)	STAGE AND INTERNSHIP	3	2	1-2
ENGINEERING ECONOMY (KU-Leuven)		3	2	1