



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA



KUNGLIGA TEKNISKA  
HÖGSKOLAN - KTH  
ROYAL INSTITUTE OF  
TECHNOLOGY - STOCKHOLM

## **Materials and Sensor Engineering for Environmental Sustainability (MSE)**

**Study plan of all MSE students must include:**

- **12 ECTS credits of European Languages courses (Module EL),**
- **78 ECTS credits in Technical courses (Modules PE, ME and SE)**
- **30 ECTS credits devoted to training and final project**

**A minimum number of 24 credits for each module (Process Engineering (Module PE), Materials Engineering (Module ME) and Sensors and the Environment (Module SE) must be inserted in any individual study plan.**

**Fundamental courses in Process Engineering and Materials Engineering will be offered to students in the first year of MSE program at UNIBO.**

**The student will be guided to the selection of fundamental courses which better complement his/her previous university curriculum, in view of a fruitful attendance of specialization courses offered in the second year at KTH (Royal Institute of Technology).**

**List of subjects offered to MSE students at Alma Mater Studiorum - Università di Bologna (UNIBO)**

<i>Module</i>	<i>Course</i>	ECTS credits	Fall	Spring
PE	Thermodynamics of Materials	9,0	X	
	Process Industry and Sustainability	6,0		X
	Transport Phenomena Laboratory	3,0	X	
	Rheology	3,0	X	
	Photocatalytical Processes and Environmental Applications	3,0		X
ME	Materials Characterization	6,0	X	
	Laboratory of Materials Characterization	3,0	X	
	Polymeric Materials	6,0		X
	Science and Technology of Composite Materials	6,0	X	
SE	Solid State Chemistry and Laboratory	6,0	X	
	Environmental and Quality Aspects in Electronics Systems Design and Manufacturing	6,0	X	
	Mathematical Methods	6,0	X	
	Introduction To Numerical Methods	6,0	X	
	Wireless Sensor Networks	6,0	X	
	Nanotechnologies for Materials	6,0	X	
	Solid State Electronics	6,0		X
	Solid State Sensors	6,0		X
	Solid State Physical Chemistry	6,0		X
Biomedical Transducers	6,0		X	
EL	Italian Language and Culture basic level	6,0	X	X
	Italian Language and Culture intermediate level	6,0	X	X
	English Language	6,0	X	X

**List of subjects offered to MSE students at Kungliga Tekniska Högskolan (KTH)**

<i>Module</i>	<i>Course</i>	ECTS credits	Fall	Spring
PE	Industrial Energy Processes	7,5	X	
	Transport Phenomena, Advanced Course	7,5	X	
	Environmental Systems Analysis	6,0	X	
	Chemical Reaction Engineering	9,0		X
	Fuel Cell	6,0		X
	Renewable Fuel Production Processes	7,5		X
	Experimental Process Design	6,0	X	
	Renewable Energy Technology	6,0	X	
	Separation Processes for the Process Industry and the Environment	6,0	X	
	Sustainable System for Heat, Power and Materials Production	7,5	X	
ME	Mechanical properties of Materials	7,5	X	
	Biomedical Materials	7,5	X	
	Polymer Technology	6,0	X	
	Biopolymers	7,5		X
	Fibre Technology – Natural and Synthetic Fibres	7,5		X
	Analytical Separations	7,5		X
	Biocomposite Materials	7,5		X
	Inorganic Materials Chemistry	7,5		X
	Pulp and Paper Processes	7,5	X	
	Polymer Chemistry	7,5	X	
	Polymer Physics	7,5	X	
Polymer Engineering	9,0	X		
SE	Life Cycle Assessment	7,5	X	
	Information searching	1,5	X	
	Energy and Environment	6,0	X	
	Ideation - Creating a Business Idea	7,5		X
	Environmental Management	6,0		X
	Theory and Methodology of Science	7,5		X
EL	Swedish for Elementary Learners	7,5	X	X
	Technical English lower level	6,0	X	X
	Technical English intermediate level	6,0	X	X