ENSI CAEN
ÉCOLE PUBLIQUE D'INGÉNIEURS
CENTRE DE RECHERCHE

Materials Science & Chemistry

Fall semester (Sept - Feb)
2nd year of Master

Teaching Units	Teaching modules	Code	Hours			ECTS
			Course	Practical Work	Total	
Languages	French as a foreign language		20		**20**	**5**
Research Project	Writing Report Oral Defense					**10**
Industrial Project	Writing Report Oral Defense					**5**

⚠ **Important note**: you cannot choose courses from different blocks. You must choose courses inside one single block (**either** Energy & Materials **or** Catalysis for Energy and Environment **or** Organic Synthesis)

Energy & Materials

Materials Science	Luminescent materials		15		**15**	**3**
	Criteria for materials selection		3	12 TP	**15**	**3**
	Amorphous materials		14		**14**	**3**
	Application of finite elements to thermo-mechanical coupling			12 TP	**12**	**3**
	Corrosion of materials		22	7TD-4TP	**32**	**3**
Choice 1 (Materials for Energy)	Fuel cells		10	4 TP	**14**	**2,5**
	Thermoelectricity		14		**14**	**2,5**
Choice 2 (Materials for structures)	*Fatigue and materials failure*		12	5 TD	**17**	**2**
	Assembly and tribology: finite elements modeling		14	12 TP	**26**	**3**
Total					***116/131***	**20**

Courses in italics are taught in French with slides, handouts and examinations in English

Chemistry – Catalysis for energy and environment

Catalysis for Energy & Environment	Life cycle analysis: Application to processes		15		**15**	**2.5**
	Biofuels & refining		15		**15**	**2.5**
	Capture, recovery and hydrogenation of CO_2		15		**15**	**2.5**
	Remediation Catalysis		15		**15**	**2.5**
	Hydrogen and synthetic gas (SynGas)		15		**15**	**2.5**
Chemical Engineering	Applied Fluid Mechanics	-	10	5TD+16TP	**31**	**4**
	Engineering of separation process		15	12 TP	**27**	**3.5**
Total					**133**	**20**

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Chemistry - Organic Synthesis						
Analytical Chemistry and Chemical engineering	Engineering of separation process		15	12 TP	**27**	**4**
Organic Synthesis	Retrosynthetic analysis & Total synthesis		20		**20**	**3**
	Asymmetric synthesis & organometallics		20		**20**	**3**
	Heterocyclic compounds		20		**20**	**3**
	Catalysis and industry		10		**10**	**2**
	Heteroelements		20		**20**	**3**
	Energy Transition		15		**15**	**2**
Total					**132**	**20**

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