

**Industrial Systems Engineering Department**  
**Curriculum 2022-2023**  
**Specialization Industrial engineering - 3rd year**

Teaching in BASIC SCIENCES
Teaching in ENGINEERING SCIENCES
Transversal teaching in LANGUAGES & HUMANITIES
Preprofessional teaching

Semester 5													
EDUCATIONAL MODULES	Hours	ECTS	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Online	Total	coeff		
Teaching in BASIC SCIENCES					23,99	28	40	0	0	91,99	3		
GI.B55	Mathematics and Computing 1	91,99	6	Probabilities and statistics	13,33	16				29,33	1		
				Numerical analysis	1,33		26,67			28	1		
				Object-oriented programming (C++)	9,33	12	13,33			34,66	1		
Teaching in ENGINEERING SCIENCES					66	88	78,67	0	0	232,67	20		
GI.S55	Electrical engineering 1	122,67	8	Automatons and networks 1	16	4	20			24	1		
				Control systems engineering	16	20	8			44	1		
				Microcontrollers 1	8	8	16			32	1		
	Mechanical engineering 1	110	8	Electric machines 3	6,67	16				22,67	1		
				Advanced strength of materials	12	16	8			36	1		
				Multibody mechanics	5,33	8	10,67			24	1		
Transversal teaching in LANGUAGES & HUMANITIES					10,66	48,67	45,34	10,67	0	115,34	6		
GI.T55	Languages, Humanities, professional and personal development	115,34	8	English 5			30,67			30,67	2		
				Entrepreneurship 1	5,33	6,67	1,33	10,67		24	1		
				CCS - introduction to ethics		4	10,67			14,67	1		
				Sport 5			22			22	1		
				Sustainable engineering	5,33	16	2,67	0		24	1		
Volume per semester per student for semester 5					440	30	100,65	164,67	164,01	10,67	0	440	29

EDUCATIONAL MODULES	Hours	ECTS	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	Total	
GI.P5.55				Elec. Course (12h MAEL, 8h00 (ELAN & ELNUM))		20		20	only elec profiles
				Méca. Course (10h40 CAP, 4h FAB, 5h20 RDM)	0	20		20	only meca profiles
				Computing		16		16	for everyone
Semester 5 total					0	56	0	56	

Semester 6													
EDUCATIONAL MODULES	Hours	ECTS	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Online	Total	coeff		
Teaching in BASIC SCIENCES					17,33	13,33	8	6	0	44,66	3,5		
GI.B56	Mathematics and Computing 2	44,66	3	Databases	9,33	8	8			25,33	2		
				Statistical probabilities				6		6	0,5		
				Computing project management	8	5,33				13,33	1		
Teaching in ENGINEERING SCIENCES					55,98	87,99	112	4	0	259,97	16,5		
GI.S56	Electrical engineering 2	110,64	8	Microcontrollers 2	6,66	8	16			30,66	2		
				Signal processing 1	6,66	9,33	4	4		23,99	1,5		
				Electronical features	6,66	9,33	20			35,99	2,5		
	Mechanical engineering 2	124	8	Electric machines 4		16	20			20	0,5		
				Industrial thermal energy	12	12				24	1,5		
				Manufacturing methods		12	12			24	1,5		
Management et production systems	25,33		8	Fluid mechanics 1	16	20	16			52	4		
				Design studio 1			24			24	1,5		
Transversal teaching in LANGUAGES & HUMANITIES					23,97	52,65	8	24	0	137,95	9		
GI.T56	Languages, Humanities, professional and personal development 2	137,95	9	English 6			29,33			29,33	2		
				Introduction to research	2,66			18,67		21,33	2		
				Entrepreneurship 2	2,66	6,66		5,33		14,65	1		
				Professional integration	2,66	4	8			14,66	1		
				Introduction to purchases	6,66	6,66				13,32	1		
				Organisation management	9,33	13,33				22,66	2		
				Sport 6			22	2,67		22	2		
Volume per semester per student for semester 6					440	30	97,28	153,97	128	34	0	441,58	29

EDUCATIONAL MODULES	Hours	ECTS	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	Total
Optional elements		1		Spelling remediation		16		16
				French as a foreign language (only for international non francophone students)			21,33	21,33
				Second language 2			21,33	21,33
				Contribution to INSA Centre Val de Loire's development				

**Industrial Systems Engineering Department**  
**Curriculum 2022-2023**  
**Specialization Industrial engineering - 3rd year**

Semester 7												
EDUCATIONAL MODULES	Hours	ECTS	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Online	Total	coeff	
Teaching in BASIC SCIENCES					18,66	22,66	2,66	5,33	0	49,31	3,00	
GI.BS7	Mathematics and Computing 3	49,31	4	Design of Experiments Tool development	Plan d'expériences Développement d'applications	13,33 5,33	17,33 5,33	2,66 2,66	5,33	30,66 18,65	2,00 1,00	
Teaching in ENGINEERING SCIENCES					71,99	71,99	56,00	36,00	0	235,98	14,00	
GI.SI7	Electrical engineering 3	118,65	9	Advanced automation	Automatique avancée	13,33	16,00	8,00		37,33	2,00	
				Power electronics	Electronique de puissance	13,33	14,67	12,00		40,00	2,00	
				Signal processing 2	Traitement du signal 2	6,66	6,66	4,00	4,00	21,32	1,00	
				Automatons and networks 2	Automate et réseaux 2				20,00	20,00	1,00	
	Mechanical engineering 3	117,33	9	Finite elements - structural calculations	Elements finis - calcul de structures	16,00	16,00	12,00		44,00	3,00	
				Vibration of structures	Vibration des structures	12,00	9,33	8,00		29,33	2,00	
				Fluid mechanics 2	Mécanique des fluides 2	10,67	9,33	12,00		32,00	2,00	
				Mechanical project	Projet de méca			12,00		12,00	1,00	
Transversal teaching in LANGUAGES & HUMANITIES					14,66	58,00	36,00	4,00	0	112,66	8,00	
GI.TLS7	Languages, Humanities, professional and personal development 7	112,66	8	English 7	Anglais 7			30,67		30,67	2,50	
				Humanities project	Projet SHS		4,00	5,33	4,00		13,33	1,00
				Industrial marketing	Marketing industriel	4,00	12,00			16,00	1,00	
				Culture and communication 6	Culture et communication 6	1,33	12,00	0,00		13,33	1,00	
				HR management	GRH	9,33	8,00			17,33	1,00	
				Sport 7	EPS 7		22,00			0,00		22,00
Volume per semester per student for semester 7				397,95	30	105,31	152,66	94,66	45,33	0	397,95	25,00

Semester 8												
EDUCATIONAL MODULES	Hours	ECTS	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Online	Total	coeff	
Teaching in ENGINEERING SCIENCES					55,98	87,99	112	4	0	259,97	16,5	
GI.SI8	Engineering sciences	95,99	8	Materials for engineers	Matériaux pour l'ingénieur	6,66	8	16		30,66	2,00	
				Advanced object-oriented programming	Programmation orientée objet avancée	6,66	9,33	4	4	23,99	1,50	
				Project management	Gestion de projet							
				Dependability	Sûreté de fonctionnement	6,66	9,33	20		35,99	2,50	
				Introduction to industrial management systems	Introduction aux systèmes de management industriel		16	20		20	0,50	
Transversal teaching in LANGUAGES & HUMANITIES					23,97	52,65	8	24	0	137,95	9	
GI.TLS8	Languages, Humanities, professional and personal development	54,65	5	English 8	Anglais 8			29,33		29,33	2,00	
				Culture and communication 7	Culture et communication 7	0	10,66	2,66		21,33	2,00	
				Psychosociology at work	Psychosociologie du travail	2,66	6,66		5,33	14,65	1,00	
				Sport 8	EPS 8	2,66	4	8		14,66	1,00	
PREPROFESSIONAL TEACHING					24,00	73,00	36,00	27,00	0,00	160,00	15,00	
GI.PS8	Preorientation ACAD Preorientation IAI Preorientation IMC Preorientation ENR Preorientation PMFSI	32	3	Introduction to business intelligence	Introduction à l'informatique décisionnelle	8,00	5,33	8,00		21,33	2,00	
				Automatons and networks 3	Automates et réseaux 3				10,67	10,67	1,00	
				Business management simulation	Simulation de gestion d'entreprise				16,00	16,00	1,00	
				Introduction to financial analysis	Introduction à l'analyse financière		16,00			16,00	1,00	
				Fluid mechanics 3	Mécanique des fluides 3		4,00	12,00		16,00	1,00	
				Finite element calculations on Abaqus	Calcul éléments finis sur Abaqus			16,00		16,00	1,00	
	Physics of materials (for ENR students)	Physique des matériaux pour les ENR	8,00	8,00			16,00	1,00				
	Technical and geopolitical challenges of energy	Enjeux techniques et géopolitiques de l'énergie	8,00	8,00			16,00	1,00				
Semester 8 Internship	16 weeks minimum	14	Industrial management system	Système de management industriel			16,00		16,00	1,00		
			Introduction to maintenance	Introduction à la maintenance			16,00		16,00	1,00		
				Internship smooth running	Déroulement du stage					2,00		
				Internship report	Rapport de stage					1,00		
				Internship viva voce	Soutenance de stage					1,00		
Volume per semester per student for semester 8				182,64	30	58,66	163,98	56,00	32,00	0,00	310,64	26,50

TOTAL 4th YEAR GI

60

580,59

EDUCATIONAL MODULES	Hours	ECTS	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	Total
Optional elements		1	Spelling remediation	Remédiation en orthographe		16		16
			French as a foreign language (only for international non francophone students)	Français langue étrangère uniquement pour les étudiants étrangers non francophones			22,66	22,66
			Second language 2	LV2			22,66	22,66
			Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école				

**Curriculum 2022-2023**

Industrial Systems Engineering - year 5 - Semesters 9 & 10

SPECIALIZATION **AC**quisition Analysis and Decision

(GSI-5A-SEM9&10-ACAD)

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS	Coef.
<b>COMMON CORE</b>			<b>34,68</b>	<b>21,33</b>	<b>4</b>		<b>60,01</b>	<b>4</b>	
<b>S9-TC</b>	Human Resources management	Management des hommes	4	4			8	4	1
	Industry of the future	Industrie du futur	16				16		1
	Monitoring and innovation and industrial property	Veille et innovation et propriété industrielle	6,67	2,67			9,34		1
	Professional integration	Insertion professionnelle	2,67	1,33	4		8		1
	Labour law	Droit du travail	2,67	8			10,67		1
	Contract law	Droit des contrats	2,67	5,33			8		1
<b>PROJECT</b>					<b>60</b>		<b>60</b>	<b>4</b>	
	End-of-study project	Projet de fin d'études			60		60	4	
<b>Industrial systems</b>			<b>20</b>	<b>41,33</b>	<b>14,67</b>		<b>76</b>	<b>5</b>	
	Production system analysis	Analyse des systèmes de Production	12	12			24	5	1
	English at work	Anglais métier	16	20			20		2
	IOT : Internet of things	IOT : Internet of things	8	9,33	14,67	0	32		2
<b>Acquisition</b>			<b>46,66</b>	<b>44</b>	<b>28</b>		<b>127,99</b>	<b>7</b>	
	Virtual instrumentation	Instrumentation Virtuelle		2,67	8	9,33	20	7	2
	Piezoelectric materials and devices	Piezoelectric materials and devices	13,33	12			25,33		2
	Metrology and sensors	Métrologie et Capteurs	16	13,33			29,33		2
	Sound	Bruit	5,33	5,33			10,66		1
	Real time and embedded systems	Temps réel et systèmes embarqués	12	10,67	20		42,67		3
<b>Analysis</b>			<b>37,33</b>	<b>13,33</b>	<b>32</b>		<b>82,66</b>	<b>5</b>	
	Digital filtering	Filtrage Numérique	8		8		16	5	1
	Non-destructive test	Contrôle non destructif	8	6,67	8		22,67		1
	Image processing	Traitement d'images	8	6,66	8		22,66		2
	Data transmission	Transmission de données	13,33		8		21,33		1
<b>Decision</b>			<b>28,34</b>	<b>30,33</b>	<b>16</b>		<b>77,34</b>	<b>5</b>	
	GPGPU programming	Programmation GPU	2,67		4	2,67	9,34	5	1
	Computer Vision	Computer Vision	4	12	0		16		1
	Decision aids	Aide à la décision	9,67	8,33			18		1
	Machine learning	Machine Learning	12	10	12		34		2
<b>Semester 9 total</b>			<b>167,01</b>	<b>150,32</b>	<b>154,67</b>		<b>484</b>	<b>30</b>	<b>31,00</b>
EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS	Coef.
<b>Optional element</b>	Spelling remediation	Remédiation en orthographe		16			16		
	French as a foreign language (only for international non francophone students)	Français langue étrangère uniquement pour les étudiants étrangers non francophones)			21,33		21,33		
	Second language 2	LV2			21,33		21,33		
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école					0		
<b>END-OF-STUDY INTERNSHIP</b>				<b>24 weeks minimum</b>				<b>30</b>	
<b>Semester 10-Internship</b>	Internship smooth running	Déroulement du stage						30	2
	Internship viva voce	Soutenance de stage							1
	Internship report	Rapport de stage							1
<b>Semester 10 total</b>								<b>30</b>	

**Curriculum 2022-2023**  
**Industrial Systems Engineering - year 5 - Semesters 9&10**  
**SPECIALIZATION Renewable Energies**  
**(GSI-5A-SEM9&10-ENR)**

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	TD	TP	P	Total	ECTS	Coef.
<b>COMMON CORE</b>									
S9-TC	Human Resources management	Management des hommes	4	4			8	4	1
	Industry of the future	Industrie du futur	16				16		1
	Monitoring and innovation and industrial property	Veille et innovation et propriété industrielle	6,67	2,67			9,34		1
	Professional integration	Insertion professionnelle	2,67	1,33	4		8		1
	Labour law	Droit du travail	2,67	8			10,67		1
	Contract law	Droit des contrats	2,67	5,33			8	1	
<b>ENR PROJECT &amp; TERRITORY</b>					60		60	4	
S9ENR-PROJ	ENR & territory end-of-study project	Projet de fin d'études ENR et territoire			60		60	4	
<b>SOLAR ENERGY</b>			22,67	20	8		86,67	5	
S9ENR-SOL	Photovoltaic technology : cells & solar panels	Technologie photovoltaïque : cellules et panneaux solaires	6,67	6,67		12	25,33	5	1
	Photovoltaic technology : operation & implementation	Technologie photovoltaïque : operation & application	8	13,33	8	12	41,33		2
	Solar thermal power	Energie solaire thermodynamique	8			12	20		1
<b>RENEWABLE ENERGIES INSTRUMENTATION</b>			20	24	16		61,33	4	
S9ENR-INSTRU	Metrology & sensors	Métrologie et capteurs	8	8	8		16	4	1
	Data analysis (only for ENR)	Analyse de données (spécifique ENR)	5,33	6,67	8		21,33		1
	Energy collection system	Systèmes de récupération d'énergie	6,67	9,33			24		1
<b>WIND ENERGY</b>			22,67	16	6,67	12	61,33	5	
S9ENR-EOL	Aero/hydrodynamics	Aéro/hydrodynamique	8		6,67		14,67	5	2
	Turbomachinery	Turbomachines	6,67	6,67			13,34		2
	Electric power generation originating from wind energy	Génération d'énergie électrique d'origine éolienne	8	9,33			17,33		2
<b>ENERGY STORAGE</b>			29,33	21,33	6,67	12	69,33		
S9ENR-STOC	Electrochemical storage	Stockage électrochimique	13,33	5,33			25,33	4	2
	Mechanical energy storage	Stockage mécanique	2,67	6,67			9,33		1
	Hydrogen technology	Technologie Hydrogène	13,33	9,33		12	34,67		2
<b>ENERGY &amp; SOCIETY</b>			45,34	30,67	0	12	88	5	
S9ENR-SOC	Electricity networks	Réseaux électriques	17,33				17,33	5	1
	Energy efficiency of buildings	Energétique des bâtiments	10,67	6,67		12	5		2
	Energy and environmental project management	Conduite de projets énergétiques et environnementaux	10,67				10,67		1
	Environmental law and environmental standards	Droit de l'environnement et normes environnementales	6,67	4			10,67		1
	English (for work)	Anglais métier	20	8	4		20		1
<b>Semester 9 total</b>			174,68	128	50,67	132	485	30	24,00
<b>Optional elements 9</b>									
S9	French a foreign language	Français langue étrangère uniquement pour les étudiants étrangers non francophones)		(32)					
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école						(1)	
	Contribution to a themed sector	Participation à une filière à thème						1 à 2	
	Project within a themed sector	Projet à l'intérieur d'une filière à thème						1 à 2	
<b>EDUCATIONAL MODULES</b>									
<b>END-OF-STUDY INTERNSHIP</b>								30	
Semester 10-Internship	Internship smooth running	Déroulement du stage							2
	Internship viva voce	Soutenance de stage						30	1
	Internship report	Rapport de stage							1
<b>Semester 10 total</b>								30	

**Curriculum 2022-2023**

Industrial Systems Engineering - year 5 - Semesters 9&10

**SPECIALIZATION Industrial Purchases Engineering**

(GSI-5A-SEM9&10-IA)

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS	Coef.
<b>COMMON CORE</b>									
S9-TC	Human Resources management	Management des hommes	34,68	21,33	4		60,01	4	
	Industry of the future	Industrie du futur	4	4			8		1
	Monitoring and innovation and industrial property	Veille et innovation et propriété industrielle	16				16		1
	Professional integration	Insertion professionnelle	6,67	2,67			9,34	4	1
	Labour law	Droit du travail	2,67	1,33	4		8		1
	Contract law	Droit des contrats	2,67	8			10,67		1
			2,67	5,33			8		1
<b>PROJECT</b>									
	End-of-study project	Projet de fin d'études			60		60	4	
<b>Purchases</b>									
			122,67	47,99	12		182,66	9	
	Purchasing process	Démarche achat	70,67	33,33	6,67		110,67		1
	Purchasing tools and techniques	Outils et techniques de l'achat	52	14,66	5,33		71,99	9	1
<b>Negotiations and business relations</b>									
			29,33	24			53,33	3	
	Business negotiation engineering	Ingénierie de la négociation commerciale	20	16			36		2
	National and international commercial contract law	Droit national et international des contrats commerciaux	9,33	8			17,33	4	1
<b>Supply-chain and management</b>									
			29,33	13,33			46,66	4	
	Financial management and control	Gestion et contrôle financier		13,33			13,33	4	1
	Supply Chain management	Supply Chain management	29,33	0			33,33		2
<b>General company culture</b>									
			36	44	0		80	6	
	English at work	Anglais métier		28			28		1
	Work culture	Culture professionnelle	20	16			36	5	1
	International culture	Culture internationale	16				16		1
<b>Semester 9 total</b>			<b>216,01</b>	<b>106,65</b>	<b>76</b>		<b>483</b>	<b>30</b>	<b>17,00</b>
<b>Optional elements 9</b>									
	French as a foreign language (only for international non francophone students)	Français langue étrangère uniquement pour les étudiants étrangers non francophones)						(1)	
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école						(1 ou 2)	
<b>EDUCATIONAL MODULES</b>									
<b>END-OF-STUDY INTERNSHIP</b>									
				24 weeks minimum				30	
Semester 10-Internship	Internship smooth running	Déroulement du stage							2
	Internship viva voce	Soutenance de stage						30	1
	Internship report	Rapport de stage							1
<b>Semester 10 total</b>								<b>30</b>	

**Curriculum 2022-2023**  
Industrial Systems Engineering - year 5 - Semesters 9&10  
SPECIALIZATION Mechanical Engineering and Design  
(GSI-5A-SEM9&10-IMC)

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS	Coef.	
<b>COMMON CORE</b>			<b>34,68</b>	<b>21,33</b>	<b>4</b>		<b>60,01</b>	<b>4</b>		
S9-TC	Human Resources management	Management des hommes	4	4			8	4	1	
	Industry of the future	Industrie du futur	16				16		1	
	Monitoring and innovation and industrial property	Veille et innovation et propriété industrielle	6,67	2,67			9,34		1	
	Professional integration	Insertion professionnelle	2,67	1,33	4		8		1	
	Labour law	Droit du travail	2,67	8			10,67		1	
	Contract law	Droit des contrats	2,67	5,33			8		1	
<b>PROJECT</b>					<b>60</b>		<b>60</b>	<b>4</b>		
	End-of-study project	Projet de fin d'études			60		60	4		
<b>Materials</b>			<b>52</b>	<b>28</b>	<b>0</b>		<b>73,33</b>	<b>5</b>		
	Metallic materials implementation	Mise en œuvre des matériaux métalliques	4				24	5	2	
	Advanced materials	Matériaux avancés	14,67	5,33			28		2	
	Polymeric and composite materials	Matériaux polymères et composites	21,33	14,67			8		1	
	Fatigue and fracture mechanics	Fatigue et mécanique de la rupture	12	8			13,33		1	
<b>Aerodynamics and transport</b>			<b>45,33</b>	<b>28</b>	<b>0</b>		<b>73,33</b>	<b>5</b>		
	Energy transfer in turbomachinery	Transfert de l'énergie dans les turbomachines	12	12			24	5	2	
	Aerodynamics	Aérodynamique	12	16			28		2	
	Vehicle technology	Technologie automobile	8				8		1	
	Reciprocating internal combustion engines	Moteurs alternatifs a combustion interne	13,33				13,33		1	
<b>Experimental and numerical methods</b>			<b>84</b>	<b>56</b>	<b>12</b>		<b>152</b>	<b>8</b>		
	Robust optimization	Optimisation robuste	8	12			20	8	1	
	Nonlinear mechanics	Mécanique non linéaire	28	8			36		1,5	
	Thermo-mechanical simulations	Simulations thermo-mécaniques	12	12			24		1	
	Vibrations and acoustics	Vibrations et acoustique	12	12			24		1	
	Crash	Crash	12	12			24		1	
	Experimental vibration analysis	Analyse vibratoire expérimentale	12		12		24		1	
<b>General culture for engineers</b>			<b>8</b>	<b>24</b>	<b>20</b>		<b>52</b>	<b>3</b>		
	Eco-design and components recycling (in english)	Eco-conception et recyclage des composants (en anglais)	8	4			12	3	1	
	English at work	Anglais métier		20	20		40		2	
<b>Semester 9 total</b>			<b>224,01</b>	<b>157,33</b>	<b>96</b>		<b>470,67</b>	<b>29</b>	<b>27,50</b>	
<b>Optional elements 9</b>										
	Second language 9	LV2-9						1		
	French as a foreign language	Français langue étrangère						1		
	Contibution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école								
<b>EDUCATIONAL MODULES</b>										
<b>END-OF-STUDY INTERNSHIP</b>										
			<b>24 weeks minimum</b>						<b>30</b>	
Semester 10-Internship	Internship smooth running	Déroulement du stage						30	2	
	Internship viva voce	Soutenance de stage					1			
	Internship report	Rapport de stage					1			
<b>Semester 10 total</b>								<b>30</b>		

**Curriculum 2020 - 2021**  
Industrial Systems Engineering - year 5 - Semesters 9&10  
SPECIALIZATION Performance Maintenance and Reliability of Industrial System  
(GSI-5A-SEM9&10-PMFSI)

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	TD	TP	P	Total	ECTS	Coef.
<b>COMMON CORE</b>			<b>30,67</b>	<b>25,32</b>	<b>4</b>		<b>59,99</b>	<b>4</b>	
S9-TC	Human Resources management	Management des hommes		8			8	4	1
	Industry of the future	Industrie du futur	16				16		1
	Monitoring and innovation and industrial property	Veille et innovation et propriété industrielle	8	1,33			9,33		1
	Professional integration	Insertion professionnelle	2,67	1,33	4		8		1
	Labour law	Droit du travail	1,33	9,33			10,66		1
	Contract law	Droit des contrats	2,67	5,33			8	1	
<b>PROJECT</b>					<b>60</b>		<b>60</b>	<b>4</b>	
S9PMFSI-PROJ	End-of-study project	Projet de fin d'études			60		60	4	
<b>Production management</b>			<b>52</b>	<b>44</b>	<b>0</b>		<b>96</b>	<b>6</b>	
S9PMFSI-GESPROD	Production system analysis*	Analyse des Systèmes de Production*	12	12			24	6	1
	Production system simulation (ARENA)	Simulation des systèmes de Production (ARENA)	12	12			24		1
	Supply Chain & Logistics*	Supply chain & logistique *	12	4			16		1
	Industrialization*	Industrialisation *	8	8			16		1
	Continuous improvement /Lean	Amélioration continue / Lean	8	8	0		16		1
<b>EHS</b>			<b>40</b>	<b>52</b>	<b>0</b>		<b>92</b>	<b>5</b>	
S9PMFSI-QHSE	Integrated management system*	Systèmes de management intégré *	24	16			40	5	1
	Regulation / prevention plan*	Règlementation / plan de prévention *	12	8			20		1
	Eco-design & recycling	Eco-conception & recyclage	4	8			12		1
	English at work	Anglais métier		20			20		1
<b>Reliability and dependability</b>			<b>58,67</b>	<b>13,33</b>	<b>8</b>		<b>80</b>	<b>5</b>	
S9PMFSI-SDF	Sustainability, Fatigue and lifespan*	Durabilité, Fatigue et Durée de vie *	12	8	8		28	5	2
	Advanced materials*	Matériaux avancés*	14,67	5,33			20		2
	Dependability engineering	Ingénierie de la SDF	32	0			32		2
<b>Maintenance</b>			<b>70</b>	<b>14</b>	<b>8</b>		<b>100</b>	<b>6</b>	
S9PMFSI-MAINTE	Engineering data analysis and optimisation*	Analyse de données d'ingénierie et optimisation *	22	6		4	32	6	1
	Mainten. Operat. (16h00) : Pro.Log.Manag. Inter. (ERP) - Process Management (BPM)	Mainten. Operat. (16H00) / Pro. Log. Gest. Int. (ERP) - Gest. des Processus (BPM)	32	8			40		1
	Monitoring and machine vibration diagnosis ((ISO AFNOR/E90D)*)	Surveillance et diagnostic vibratoire des machines (ISO AFNOR/E90D) *	16	0	8	4	28		1
<b>Semester 9 total</b>			<b>251,34</b>	<b>148,65</b>	<b>80</b>	<b>0</b>	<b>487,99</b>	<b>30</b>	<b>24,00</b>
<b>Optional elements 9</b>									
S9PMFSI-ELFAC	French a a foreign language (only for international non francophone students)	Français langue étrangère uniquement pour les étudiants étrangers non francophones)						(1)	
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école						(1)	
	Contribution to INSA Centre Val de Loire's development - Active member	Participation au rayonnement de l'école - Membre actif						2	
<b>EDUCATIONAL MODULES</b>									
<b>END-OF-STUDY INTERNSHIP</b>									
				<b>24 weeks minimum</b>				<b>30</b>	
Semester 10-Internship	Internship smooth running	Déroulement du stage						30	2
	Internship viva voce	Soutenance de stage							1
	Internship report	Rapport de stage							1
<b>Semester 10 total</b>								<b>30</b>	