

**Curriculum 2020 - 2021**  
**Industrial Systems Engineering - year 3**

**Semester 5**

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS	coeff	CODE
<b>BASIC SCIENCES</b>			<b>23,99</b>	<b>28</b>	<b>40</b>	<b>0</b>	<b>91,99</b>	<b>8</b>		
Mathematics and Computing 5	Probabilities and statistics	Probabilités et statistiques	13,33	16			29,33	8	1	POOC+
	Numerical analysis	Applications de l'analyse numérique	1,33		26,67		28		1	
	Object-oriented programming (C++)	Programmation orientée objet C++	9,33	12	13,33		34,66		1	
<b>ENGINEERING SCIENCES</b>			<b>67,34</b>	<b>88</b>	<b>77,33</b>	<b>0</b>	<b>232,67</b>	<b>16</b>		
Automatic and Control 5	Automatons and networks 1 Control systems engineering	Automates et réseaux 1 Systèmes asservis	4 16	20 8	20 16		24 44	4	1 1	AUR1 SYSASS
Electrical engineering 5	Microcontrollers 1 Electric machines 3	Microcontrôleurs 1 Machines électriques 3	8 6,67	8 16	16 22,67		32 22,67	4	1 1	MIC1 MAEL3 RDMAV
Mechanical engineering 5	Advanced strength of materials	RDM Avancé	12	16	8		36	8	1	
	Multibody mechanics	Mécanique des multicoorps	6,67	8	9,33		24		1	
	Continuum mechanics	Mécanique des milieux continus	18	16	16		50		2	MMC
<b>MODERN LANGUAGES</b>					<b>30,67</b>		<b>30,67</b>	<b>3</b>		
Languages 5	English 5	Anglais 5			30,67		30,67	3	1	ANG5
	French as a foreign language (only for non french-speaking international students)	Français Langue étrangère uniquement pour les étudiants étrangers non francophones					[21,33]		1	FLE5
<b>PROFESSIONAL AND PERSONAL DEVELOPMENT</b>			<b>8</b>	<b>46</b>	<b>13,34</b>	<b>20</b>	<b>87,34</b>	<b>3</b>		
Humanities, Professional and personal development 5	Entrepreneurship	Entrepreneuriat	2,67	4		20	26,67	3	1	CC5 EP55
	CCS-ethics	CCS-éthique	4		10,67		14,67		1	
	Sport	EPS		22			22		1	
	Sustainable engineering	Ingénierie durable	5,33	16	2,67	0	24		1	
<b>Semester 5 total</b>			<b>99,33</b>	<b>162</b>	<b>161,34</b>		<b>442,67</b>	<b>30</b>	<b>16</b>	

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS
Optional components	Spelling remediation	Remédiation en orthographe		16				1
	Second language	LV2			21,33			1
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école						1

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total
GST-PS	Elec. Course (12h MAEL, 2h40 ELNUM)	Parcours Elec. (12h MAEL, 2h40 ELNUM)		18			18
	Meca. Course (18h CAO, 4h FAB, 4h RDM)	Parcours Méca (18h CAO, 4h FAB, 4h RDM)	8	12			20
	Computing (29h20 ALGO)	Informatique (29h20 ALGO)		16			16
<b>Semester 5 total</b>			<b>8</b>	<b>46</b>	<b>0</b>	<b>0</b>	<b>54</b>

PGE3  
PME3  
PINFO3

**Curriculum 2020 - 2021**  
**Industrial Systems Engineering - Year 3**  
**Semester 6**

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	TUTORIAL CLASSES	PRACTICAL CLASSES	P	Total	ECTS	coeff
<b>BASIC SCIENCES</b>			<b>17,33</b>	<b>13,33</b>	<b>8</b>	<b>6</b>	<b>44,66</b>	<b>3</b>	
Mathematics and Computing 6	Database	Bases de données	9,33	8	8		25,33	3	2
	Statistical probabilities	Probabilités Statistiques			0	6	6		1
	Computing project management	Maîtrise d'œuvre informatique	8	5,33			13,33		1
<b>ENGINEERING SCIENCES</b>			<b>58,65</b>	<b>89,32</b>	<b>108</b>	<b>4</b>	<b>259,97</b>	<b>18</b>	
Electrical engineering 6	Microcontrollers 2	Microcontrôleurs 2	6,66	8	16		30,66	8	2
	Signal processing 1	Traitement du signal 1	9,33	10,66		4	23,99		1
	Electronical features	Fonctions de l'électronique	6,66	9,33	20		35,99		2
	Electric machines 4	Machines électriques 4			20		20		1
Mechanical engineering 6	Industrial thermal energy	Thermique industrielle	12	12	0		24	8	1
	Manufacturing methods	Méthodes de fabrication		12	12		24		1
	Fluid mechanics 1	Mécanique des Fluides 1	16	20	16		52		2
	Design studio 1	Bureau d'études 1			24		24		1
Management et production systems 6	Quality and statistic process control	Qualité et maîtrise statistique des processus	8	8			16	2	1
	Production management tools	Outils de gestion de production		9,33			9,33		1
<b>MODERN LANGUAGES</b>					<b>29,33</b>		<b>29,33</b>	<b>3</b>	
Languages 6	English	Anglais			29,33		29,33	3	1
	French as a foreign language (only for non french-speaking international students)	Français Langue étrangère uniquement pour les étudiants étrangers non francophones			[22,66]				
<b>PROFESSIONAL AND PERSONAL DEVELOPMENT</b>			<b>5,32</b>	<b>26,66</b>	<b>12</b>		<b>109,97</b>	<b>6</b>	
Humanities, professional and personal development 6	Course Research programme	Parcours recherche	2,66			18,67	21,33	6	1
	Culture and communication	Culture et communication	1,33	10,66	4		15,99		1
	Professional integration	Insertion professionnelle	2,66	4	8		14,66		1
	Introduction to procurements	Introduction aux achats	1,33	12			13,33		1
	Organisation management	Gestion des organisations	9,33	13,33			22,66		1
	Sport 6	EPS 6			22		22		1
<b>Semester 6 total</b>			<b>81,3</b>	<b>129,31</b>	<b>157,33</b>		<b>443,93</b>	<b>30</b>	<b>25</b>
EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS	
Optional components	Spelling remediation	Remédiation en orthographe		16					1
	Second language	LV2			22,66				1
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école							1

**Curriculum 2020 - 2021**  
**Industrial Systems Engineering - Year 4**

**Semester 7**

EDUCATIONAL MODULES	COMPONENTS	ELEMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS	Coef.
<b>ENGINEERING SCIENCES</b>			<b>90,65</b>	<b>94,66</b>	<b>58,66</b>	<b>41,33</b>	<b>285,29</b>	<b>22,00</b>	
Mathematics and Computing 7	Experimental design VBA development	Plan d'expériences Développement VBA	13,33 5,33	17,33 5,33			30,66 18,65	6	2 1
Electrical engineering 7	Advanced automation	Automatique avancée	13,33	16,00	8,00		37,33	8	2
	Power electronics	Electronique de puissance	13,33	14,67	12,00		40,00		2
	Signal processing 2	Traitement du signal 2	6,66	6,66	4,00	4,00	21,32		1
	Automatons and networks 2	Automate et réseaux 2				20,00	20,00		1
Mechanical engineering 7	Finite elements - structure calculations	Eléments finis - calcul de structures	16,00	16,00	12,00		44,00	8	2
	Vibrations of structures	Vibrations des structures	12,00	9,33	8,00		29,33		2
	Fluid mechanics 2	Mécanique des fluides 2	10,67	9,33	12,00		32,00		2
	Meca project	Projet de méca				12,00	12,00		1
<b>MODERN LANGUAGES</b>			<b>0</b>	<b>0</b>	<b>31</b>	<b>0</b>	<b>30,67</b>	<b>2,00</b>	
Languages 7	English 7	Anglais 7			30,67		30,67	2	2
	French as a foreign language (only for non french-speaking international students)	Français Langue étrangère uniquement pour les étudiants étrangers non francophones			[22,66]				
<b>PROFESSIONAL AND PERSONAL DEVELOPMENT</b>			<b>13</b>	<b>57</b>	<b>8</b>	<b>4</b>	<b>82,00</b>	<b>6,00</b>	
Humanities, professional and personal development 7	Humanities Project	Projet SHS		4,00	5,33	4,00	13,33	6	1
	Industrial marketing	Marketing industriel	4,00	12,00			16,00		1
	Culture and communication	Culture et communication		10,67	2,67		13,34		1
	Human resources management	GRH	9,33	8,00			17,33		1
	Sport 7	EPS 7		22,00			22,00		2
<b>Semester 7 total</b>			<b>103,98</b>	<b>151,33</b>	<b>97,33</b>	<b>45,33</b>	<b>397,96</b>	<b>30</b>	<b>24</b>

  

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS
Optional components	Spelling remediation	Rémédiation en orthographe		16				1
	Second language	LV2			21,33			1
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école						1

**CURRICULUM 2020 - 2021**  
**Industrial Systems Engineering - Year 4**  
**Semester 8**

EDUCATIONAL MODULES	COMPONENT	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS	Coef.
<b>Engineering sciences</b>			<b>47,99</b>	<b>170,66</b>	<b>108,00</b>	<b>58,67</b>	<b>95,99</b>	<b>8</b>	
Engineering sciences	Materials for engineers	Matériaux pour l'ingénieur	9,33	20,00			29,33	8	2
	Advanced object-oriented programming	Programmation Orientée Objet avancée	4	5,33		5,33	14,66		1
	Project management	Gestion de projet	2,67	13,33			16		1
	Dependability	Sûreté de fonctionnement		20			20		1
	Introduction to industrial management system	Introduction aux systèmes de management industriel		16			16		1
<b>Pre-orientation courses</b>			<b>23,99</b>	<b>86,67</b>	<b>72,00</b>	<b>26,67</b>	<b>32,00</b>	<b>3</b>	
Pre-orientation courses	Fluid mechanics 3	Mécanique des fluides 3		4	12		32	3	1
	Finite element calculations on Abaqus	Calcul éléments finis sur Abaqus			16				1
	Introduction to business intelligence	Introduction à l'informatique décisionnelle	8,00	5,33	8				1
	Automatons and networks 3	Automates et réseaux 3				10,67			1
	Business management simulation	Simulation de gestion d'entreprise				16			1
	Introduction to financial analysis	Introduction à l'analyse financière		16					1
	Industrial management system	Système de Management industriel		16					1
	Introduction to maintenance	Introduction à la maintenance		16					1
<b>MODERN LANGUAGES</b>			<b>0</b>	<b>0</b>	<b>16</b>	<b>0,00</b>	<b>16,00</b>	<b>2</b>	
Languages	English	Anglais			16,00		16	2	1
	French as a foreign language	FLE		[22,66]					
<b>PROFESSIONAL AND PERSONAL DEVELOPMENT</b>			<b>11</b>	<b>23</b>	<b>4</b>	<b>0,00</b>	<b>37,33</b>	<b>3</b>	
Humanities, professional and personal development	Entrepreneurship	Entrepreneuriat	5,33	6,67			12	3	1
	Psychosociology at work	Psychosociologie du travail	5,33	4	4		13,33		1
	Sport 8	EPS 8		12			12		1
<b>INTERNSHIP - Engineer assistant</b>			<b>17 weeks minimum</b>					<b>14</b>	
Semester 8-internship	Internship smooth running	Déroulement du stage						14	2
	Internship report	Rapport de stage							1
	Internship viva voce	Soutenance de stage							1
<b>Semester 8 total</b>			<b>69,31</b>	<b>264,00</b>	<b>148,00</b>	<b>58,67</b>	<b>181,32</b>	<b>30</b>	<b>22,00</b>

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS
Optional components	Spelling remediation	Remédiation en orthographe	16					1
	Second language	LV2		22,66				1
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école						1

**Curriculum 2020 - 2021**

**Industrial systems engineering - year 5 - Semesters 9 & 10  
SPECIALIZATION ACquisition 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>										
S9-TC	Human Resources management	Management des hommes	30,67	8	4		59,99	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	4	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>										
	End-of-study project	Projet de fin d'études			60		60	4		
<b>Industrial systems</b>										
	Production system analysis	Analyse des systèmes de Production	20	41,33	14,67		76	5	1	
	English at work	Anglais métier		20			20	5	2	
	Web architecture, intra/extranet automatons	Architecture web, automates intra/extranet	8	9,33	14,67	0	32		2	
<b>Acquisition</b>										
	Virtual instrumentation	Instrumentation Virtuelle	46,66	44	28		127,99	7	2	
	Piezoelectric materials and devices	Piezoelectric materials and devices		2,67	8	9,33	20		2	
	Metrology and sensors	Métrieologie et Capteurs	13,33	12			25,33	7	2	
	Sound	Bruit	16	13,33			29,33		1	
	Real time and embedded systems	Temps réel et systèmes embarqués	5,33	5,33			10,66		3	
			12	10,67	20		42,67			
<b>Analysis</b>										
	Digital filtering	Filtrage Numérique	37,33	13,34	32		82,67	5	1	
	Non-destructive test	Contrôle non destructif	8	8			16		1	
	Image processing	Traitement d'images	8	6,67	8		22,67	5	2	
	Data transmission	Transmission de données	8	6,67	8		22,67		1	
			13,33	8			21,33			
<b>Decision</b>										
	GPGPU programming	Programmation GPU	28,34	28,33	16		75,34	5	1	
	Computer Vision	Computer Vision	2,67	4	2,67		9,34		1	
	Decision aids	Aide à la décision	4	12	0		16	5	1	
	Machine learning	Machine Learning	9,67	8,33			18		1	
			12	8	12		32		2	
<b>Semester 9 total</b>			<b>163</b>	<b>152,32</b>	<b>154,67</b>		<b>482</b>	<b>30</b>	<b>31,00</b>	
<b>Semester 9 optional components</b>										
	French as a foreign language	Français Langue étrangère						(1)		
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école						(1 ou 2)		
<b>EDUCATIONAL MOIDULES</b>										
<b>END-OF-STUDY INTERNSHIP</b>			<b>24 weeks minimum</b>					<b>30</b>		
<b>Semester 10-Intership</b>	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 2020 - 2021**

Industrial Systems Engineering - year 5 - Semesters 9&10

**SPECIALIZATION Industrial Purchases Engineering**

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

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	P	Total	ECTS	Coef.
<b>COMMON CORE</b>			30,67	25,32	4		59,99	4	
<b>S9-TC</b>	Human Resources management	Management des hommes		8			8		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	4	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>					60		60	4	
	End-of-study project	Projet de fin d'études			60		60	4	
<b>Purchases</b>			122,66	54,67	12		189,33	9	
	Purchasing process	Démarche achat	74,66	36	6,67		117,33	9	1
	Purchasing tools and techniques	Outils et techniques de l'achat	48	18,67	5,33		72		1
<b>Negotiations and business relations</b>			22,67	19,99			42,66	3	
	Business negotiation engineering	Ingénierie de la négociation commerciale	16	13,33			29,33		2
	National and international commercial contract law	Droit national et international des contrats commerciaux	6,67	6,66			13,33	3	1
<b>Supply-chain and management</b>			29,33	21,33			50,66	4	
	Financial management and control	Gestion et contrôle financier		13,33			13,33	4	1
	Logistics	Logistique	29,33	8			37,33		2
<b>General company culture</b>			42,67	9,33	28		80	6	
	English at work	Anglais métier			28		28		1
	Work culture	Culture professionnelle	18,67	9,33			28	6	1
	International culture	Culture internationale	24				24		1
<b>Semester 9 total</b>			205,33	121,31	76		483	30	17,00
<b>Optional components</b>									
	French as a foreign language	Français Langue étrangère						(1)	
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école						(1 ou 2)	
<b>EDUCATIONAL MODULES</b>									
<b>COMPONENTS</b>									
<b>ÉLÉMENTS CONSTITUTIFS</b>									
<b>END-OF-STUDY INTERNSHIP</b>				24 weeks minimum				30	

**Curriculum 2020 - 2021**  
**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>30,67</b>	<b>25,32</b>	<b>4</b>		<b>59,99</b>	<b>4</b>	
<b>S9-TC</b>	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>	
	End-of-study project	Projet de fin d'études			60		60	4	
<b>Materials</b>			<b>56</b>	<b>32</b>	<b>20</b>		<b>108</b>	<b>6</b>	
	Metallic materials implementation	Mise en œuvre des matériaux métalliques	4		20		24	6	1
	Advanced materials	Matériaux avancés	14,67	5,33			20		1
	Composite materials	Matériaux composites	13,33	2,67			16		1
	Polymeric and composite materials implementation	Mise en œuvre des matériaux polymères et composites	12	12			24		1
	Fatigue and fracture mechanics	Fatigue et mécanique de la rupture	12	12			24		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	1
	Aerodynamics	Aérodynamique	12	16			28		1
	Vehicle technology	Technologie automobile	8				8		1
	Reciprocating internal combustion engines	Moteurs alternatifs à combustion interne	13,33				13,33		1
<b>Experimental and numerical methods</b>			<b>78,67</b>	<b>57,33</b>	<b>12</b>		<b>148</b>	<b>8</b>	
	Robust optimization	Optimisation robuste	8	12			20	8	1
	Nonlinear mechanics	Mécanique non linéaire	22,67	9,33			32		1
	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>4</b>	<b>8</b>	<b>20</b>		<b>32</b>	<b>3</b>	
	Eco-design and components recycling (in english)	Eco-conception et recyclage des composants (en anglais)	4	8			12	3	1
	English at work	Anglais métier			20		20		1
<b>Semester 9 total</b>			<b>214,67</b>	<b>150,65</b>	<b>116</b>		<b>481,32</b>	<b>30</b>	<b>23,00</b>
<b>Optional components 9</b>									
	Second language (Spanish, german, chinese or portuguese)	LV2-9 (Espagnol ou allemand ou chinois ou portugais)						1	
	French as a foreign language	Français Langue étrangère						1	
	Sport 9	Sport 9						1	
	Contribution to INSA Centre Val de Loire's development	Participation au rayonnement de l'école						(1 ou 2)	
<b>END-OF-STUDY INTERNSHIP</b>									
	Internship smooth running	Déroulement du stage							2
<b>S10-Internship</b>	Internship viva voce	Soutenance de stage						30	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>	
<b>S9-TC</b>	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	1
<b>PROJECT</b>					<b>60</b>		<b>60</b>	<b>4</b>	
<b>S9PMFSI-PROJ</b>	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>	
<b>S9PMFSI-GESPROD</b>	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>	
<b>S9PMFSI-QHSE</b>	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 (in english)	Eco-conception & recyclage (en anglais) *	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>	
<b>S9PMFSI-SDF</b>	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>	
<b>S9PMFSI-MAINT</b>	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. Opérat. (16H00) / Pro. Log. Gest. Int. (ERP) - Gest. des Processus (BPM)	32	8			40		1
	Monitoring and machine vibration diagnosis	Surveillance et diagnostic vibratoire des machines (ISO AFNOR/E900) *	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 components 9</b>									
<b>S9PMFSI-ELFAC</b>	French as a foreign language	Français Langue étrangère						(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	

EDUCATIONAL MODULES	COMPONENTS	ÉLÉMENTS CONSTITUTIFS	C	Tutorial classes	Practical classes	Total	ECTS	Coef.
<b>END-OF-STUDY INTERNSHIP</b>							<b>30</b>	
<b>S10-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>	