The French text of this document (see next page) shall be deemed the authentic version, the English translation being intended for information purposes only.

2021-2022 **Systems Engineering** **Management of Technology Section**
Interdisciplinary Minor **Minor Advisor : Prof. Th. Weber**

Lecturers, credits and course periods are subject to change **106 credits**
Courses already taken within the frame of the bachelor or master cannot be taken a second time in a minor

Codes	Courses		Lecturers	Course catalogue	Credits	Number of places	Semester	
	CORE COURSES							
MICRO-570	Advanced machine learning		Billard	MT	4			S
MICRO-455	Applied machine learning		Billard	MT	4	300	A	
MGT-484	Applied probability & stochastic processes		Sutter	MTE	4		A	
COM-502	Dynamical system theory for engineers		Thiran P.	SC	4			S
ENG-421	Fundamentals in systems engineering	1)	de Weck/Gass	EL	5		A	
MATH-265	Introduction to optimization and operations research		Lurkin	GC	3		A	
MGT-448	Statistical inference and machine learning (not given in 2021-22)	2)	Kiyavash	MTE	4		A	
	DOMAIN-SPECIFIC COURSES							
	Industrial engineering							
ME-416	Fundamentals of computer aided manufacturing		Kyritsis	GM	5		A	
ME-516	Lifecycle performance of product systems		Kyritsis/Friot	GM	3			S
	Operations research							
MGT-528	Operations: economics & strategy		Weber	MTE	4		A	
MGT-483	Optimal decision making		Kuhn	MTE	4			S
MGT-526	Supply chain management		Seifert	MTE	4	60		S
	Space systems engineering							
EE-584	Spacecraft design and system engineering		Foing	EL	4		A	
	Energy and process systems engineering							
ME-451	Advanced energetics		Maréchal	GM	5		A	
ME-454	Modelling and optimization of energy systems		Maréchal	GM	4		A	
	Systems biology							
BIO-463	Genomics and bioinformatics		Rougemont	SV	4			S
ChE-411	Principles and applications of systems biology		Hatzimanikatis	CGC	3		A	
BIO-341	Systèmes dynamiques en biologie		Naef	SV	4		A	
	Network systems engineering							
MGT-416	Causal inference		Kiyavash	MTE	3			S
COM-514	Mathematical foundations of signal processing		Bejar Haro/Simeoni	SC	6		A	
COM-512	Networks out of control	2)	Thiran P./Grossglauser	SC	4			S
	Control engineering							
ME-524	Advanced control systems		Karimi	GM	3			S
ME-523	Commande non linéaire		Müllhaupt	GM	3		A	
ME-425	Model predictive control		Jones	GM	4		A	
ME-421	System identification		Karimi	GM	3			S
	Project							
ENG-422	Optional project in Systems engineering		Various lecturers	--	8		A or S	

Remarks :
1) Recommended for everyone
2) Given every 2 years

Legend :
A = autumn S = spring
1 semester = 14 weeks

2021-2022 **Systems Engineering**
Mineur interdisciplinaire

Section de Management de la Technologie
Responsable : Prof. Th. Weber

Les enseignants, les crédits et la période des cours sont indiqués sous réserve de modifications.   **106   crédits offerts**
Les cours déjà suivis au bachelor ou au master ne peuvent pas être repris dans le mineur.

Codes	Matières		Enseignants	Livret des cours	Crédits	Nbre places	Période des cours	
	CORE COURSES							
MICRO-570	Advanced machine learning		Billard	MT	4			P
MICRO-455	Applied machine learning		Billard	MT	4	300	A	
MGT-484	Applied probability & stochastic processes		Sutter	MTE	4		A	
COM-502	Dynamical system theory for engineers		Thiran P.	SC	4			P
ENG-421	Fundamentals in systems engineering	1)	de Weck/Gass	EL	5		A	
MATH-265	Introduction to optimization and operations research		Lurkin	GC	3		A	
MGT-448	Statistical inference and machine learning (pas donné en 2021-22)	2)	Kiyavash	MTE	4		A	
	DOMAIN-SPECIFIC COURSES							
	Industrial engineering							
ME-416	Fundamentals of computer aided manufacturing		Kyritsis	GM	5		A	
ME-516	Lifecycle performance of product systems		Kyritsis/Friot	GM	3			P
	Operations research							
MGT-528	Operations: economics & strategy		Weber	MTE	4		A	
MGT-483	Optimal decision making		Kuhn	MTE	4			P
MGT-526	Supply chain management		Seifert	MTE	4	60		P
	Space systems engineering							
EE-584	Spacecraft design and system engineering		Foing	EL	4		A	
	Energy and process systems engineering							
ME-451	Advanced energetics		Maréchal	GM	5		A	
ME-454	Modelling and optimization of energy systems		Maréchal	GM	4		A	
	Systems biology							
BIO-463	Genomics and bioinformatics		Rougemont	SV	4			P
ChE-411	Principles and applications of systems biology		Hatzimanikatis	CGC	3		A	
BIO-341	Systèmes dynamiques en biologie		Naef	SV	4		A	
	Network systems engineering							
MGT-416	Causal inference		Kiyavash	MTE	3			P
COM-514	Mathematical foundations of signal processing		Bejar Haro/Simeoni	SC	6		A	
COM-512	Networks out of control	2)	Thiran P./Grossglauser	SC	4			P
	Control engineering							
ME-524	Advanced control systems		Karimi	GM	3			P
ME-523	Commande non linéaire		Müllhaupt	GM	3		A	
ME-425	Model predictive control		Jones	GM	4		A	
ME-421	System identification		Karimi	GM	3			P
	Project							
ENG-422	Optional project in Systems engineering		Divers enseignants	--	8		A ou P	

Remarques :
1) Recommandé pour tous
2) Cours donné tous les 2 ans

Légende :
A = automne, P = printemps
1 semestre comprend 14 semaines.