Teaching and Examination Regulations

Masterprogramme in Stochastics and Financial Mathematics Faculty of Science

Academic year 2020-2021

- A. Faculty section
- B1. Programme specific section general provisions
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Teaching and Examination Regulations Master's programme in Stochastics and Financial Mathematics

2020-2021



Several articles for the 2020-2021 academic year will be temporarily suspended or amended as a result of the measures to stop the spread of COVID-19. These changes are included in Appendix V.

Section A: Faculty section

1. General provisions

Article 1.1 Applicability of the Regulations

1.	These Regulations apply to anyone enrolled in the programme, irrespective of the academic year in which the student was first enrolled in the programme.	Advice OLC, approval FGV (9.38 sub b)
2.	These Regulations enter into force on 1 September 2020	Advice OLC, approval FGV (9.38 sub b)
3.	An amendment to the Teaching and Examination Regulations is only permitted to concern an academic year already in progress if this does not demonstrably damage the interests of students.	Advice OLC, approval FGV (9.38 sub b)

Article 1.2 Definitions

The following definitions are used in these Regulations (in alphabetical order) :

a.	academic year:	the period beginning on 1 September and ending on 31 August of the
		following calendar year;
b.	CvB:	the Executive Board of Vrije Universiteit Amsterdam.
c.	double degree programme:	joint programme in the context of cooperation between Vrije
		Universiteit Amsterdam and the educational institution within and
		outside the Netherlands, as to gain a double university degree; of the VU
		and the educational institution concerned; though not being the same as
		a 'joint degree programme' according to the art. 7.3c WHW';
d.	EC (European Credit):	an EC credit with a workload of 28 hours of study;
e.	educational component:	a unit of study of the programme within the meaning of the WHW;
f.	examination:	the final examination of the Master's programme;
g.	exemption:	Exemption from an examination/ practical/ fieldwork based on an earlier
		successfully completed examination, or knowledge / skills of a similar
		content, level and scope gained outside higher education;
h.	FGV:	Faculty joint assembly – assembly of the faculty student council and
		faculty staff council;
i.	interim examination:	an assessment of the student's knowledge, understanding and skills
		relating to a course component. The assessment is expressed in terms of
		a final mark. An interim examination may consist of one or more partial
		examinations. A resit always covers the same material as the original
		interim examination;
j.	joint degree:	a degree awarded by an institution together with one or more
		institutions in the Netherlands or abroad, after the student has
		completed a study programme (a degree programme, a major or a
		specific curriculum within a degree programme) for which the
		collaborating institutions are jointly responsible;
k.	OLC:	programme committee;



I.	period:	a part of a semester;
m.	practical exercise:	the participation in a practical training or other educational learning
	•	activity, aimed at acquiring certain (academic) skills. Examples of
		practical exercises are:
		 researching and writing a thesis or dissertation
		 carrying out a research assignment
		 taking part in fieldwork or an excursion
		 taking part in another educational learning activity aimed at
		acquiring specific skills, or
		 participating in and completing a work placement;
n.	programme:	the totality and cohesion of the course components, teaching
		activities/methods, contact hours, testing and examination methods and
		recommended literature;
о.	SAP/SLM:	the student information system (Student Lifecycle Management);
p.	semester:	the first (September - January) or second half (February - August) of an
		academic year;
q.	specialization:	optional route of study within a degree programme indicating a
		deepening of the (inter/multi) disciplinary context of the programme;
r.	study guide:	the guide for the study programme that provides further details of the
		courses, provisions and other information specific to that programme.
		The Study Guide is available electronically at:
		https://www.vu.nl/en/study-guide/;
s.	study monitor:	dashboard for students and academic advisors with data of the student
	(studiemonitor):	and that provides insight into the student's study progress;
t.	subject:	see 'educational component';
u.	substituting course/	see under c (double degree programme). A course obtained at the
	educational component:	educational institute, within the context of cooperation, that is
		mentioned in the diploma supplement as such; not being an 'exemption'.
۷.	Track:	full route of study within a broad bachelor's or master's degree
		programme or a fully English-language route of study within a Dutch-
	- /	language bachelor's or master's degree;
w.	Thesis/ internship work	scientific research, always resulting in a written report;
	placement::	
х.	university: WHW:	Vrije Universiteit Amsterdam; the Dutch Higher Education and Research Act (Wet on het Heger
у.	VV T VV.	the Dutch Higher Education and Research Act (Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek);
7	workload:	the workload of the unit of study to which an interim examination
z.		applies, expressed in terms of credits = EC credits (ECTS = European
		Credit and Transfer Accumulation System). The workload for 1 year
		(1,680 hours) is 60 EC credits.

The other terms have the meanings ascribed to them by the WHW.

2. Study programme structure

Article 2.1 Structure of academic year and educational components

1. The study programme will be offered in a year divided into two semesters.	Ordinance CvB, see appendix 3
2. Every semester consists of three consecutive periods of eight, eight and four weeks	Ordinance CvB,



3. Assessment and Examination

Article 3.1 Signing up for education and interim examinations

1.	Every student must sign up to participate in the educational components of the programme, the examinations and resits. The procedure for signing up is described in an annex to the Student Charter.	Ordinance CvB, see appendix 3
2.	Signing up may only take place in the designated periods.	Ordinance CvB, see appendix 3
3.	If a student does not pass the examination and the resit of a component, the student is obligated to take the whole component again. This rule does not apply to practical exercises and programmes that make use of partial marks that retain their validity. For further regulations see Section B of the programme involved.	Advice OLC, approval FGV (7.13 x)

Article 3.2 Type of examination

1. At the examiner's request, the Examination Board may permit a different form of	Advice OLC,
interim examination than is stipulated in the study guide.	Approval FGV
	(7.13 l)

Article 3.3 Oral interim examinations

1. An oral assessment is public unless the Examination Board in special cases determines	Advice OLC;
otherwise.	approval FGV
	(7.13 l and n)

Article 3.4 Determining and announcing results

1.	The examiner determines the result of a written interim examination as soon as	Ordinance CvB,
	possible, but at the latest within fifteen working days. By way of departure from that	see appendix 3
	stipulated in the first clause, the marking deadline for theses, internships/ work	
	placements and final assignments is no longer than twenty working days. The	
	examiner will then immediately ensure that the marks are registered and also ensures	
	that the student is immediately notified of the mark, taking due account of the	
	applicable confidentiality standards.	
2.	a. The examiner determines the result (i.e. mark) of an oral examination as soon as	Advice OLC;
	possible, but at the latest within one working day after the examination has finished	approval FGV
	and informs the student accordingly. The third sentence of the first paragraph applies.	(7.13 o)
	b. The examiner determines the result of an interim examination no later than five	
	working days before the next (interim) examination will be held.	
3.	In the case of alternative forms of oral or written examinations, the Examination	Advice OLC;
	Board determines in advance how and by what deadline the student will be informed	approval FGV
	of the results.	(7.13 o)

Article 3.5 Examination opportunities

1.	a. Per academic year, two opportunities to take examinations per educational	Ordinance CvB,
	component will be offered.	see appendix 3



	b. By way of exception to a., the options for retaking practical components, work	
	placements and theses are detailed in the relevant work placement manual, teaching	
	regulations or graduation regulations.	
2.	The most recent mark will apply in the event of a resit. A retake is allowed for both	Ordinance CvB,
	passed and failed units of study.	see appendix 3
3.	The resit for a (partial) interim examination must not take place within ten working days	Advice OLC;
	of the announcement of the result of the (partial) examination being resat.	approval FGV
		(7.13 j)
4.	The Examination Board may allow a student an extra opportunity to sit an examination if	Ordinance CvB, see appendix 3
	that student:	see appendix s
	 a) is lacking only those credits to qualify for their degree, and; 	
	b) has failed the examination during all the previously offered attempts, unless	
	participation in an examination was not possible for compelling reasons.	
	The extra opportunity can only be offered if it concerns a written examination, a paper	
	or a take home examination. This provision excludes the practical assignments and the	
	Master's thesis. Requests for an additional examination opportunity must be submitted	
	to the Examination Board no later than 15 July. If necessary, the method of examination	
	may deviate from the provisions in the study guide.	
5.	If an educational component is no longer offered in the following academic year, one	Advice OLC,
	opportunity will be provided to sit the interim examination(s) or parts thereof during the	approval FGV
	current academic year and a transitional arrangement for the subsequent period will be	(7.13 j)
	included in the programme-specific section of the teaching and examination regulation	
	(part B).	
	N /	

Article 3.6 Marks

	e olo marko					
1.	Partial marks are given o	n a scale fro	m 1 to 10	with no m	ore than one decimal point.	Ordinance C
	-					see appendiz
2.	The final marks are giver	in whole or	half poin	ts.		Ordinance C
	J		•			see appendi
3.	In deviation from paragr	aph 2, final r	narks bet	ween 5 and	d 6 will be rounded off to whole	Ordinance C
	marks: up to 5.50 round	ed down; fro	m 5.50 ro	unded up.	To pass a course, a 6 or higher	see appendi
	is required.					
	-	of a compon	ent consis	sts of two o	or more parts, each of which are	
		-			meaning: the final mark) must	
	be rounded off using the					
		From	То	Grade	Г	
		1,00	1,24	1	-	
		1,25	1,74	1,5	-	
		1,75	2,24	2,0	-	
		2,25	2,74	2,5	-	
		2,75	3,24	3,0	-	
		3,25	3,74	3,5	-	
		3,75	4,24	4,0	4	
		4,25	4,74	4,5	4	
		4,75	5,49	5,0	4	
		5,50	6,24	6,0	4	
		6,25	6,74	6,5	4	
		6,75	7,24	7,0	4	
		7,25	7,74	7,5	-	
				/-		1



	8,25	8,74	8,5			
	8,75	9,24	9,0			
	9,25	9,74	9,5			
	9,75	10,0	10			
4. The Examination Board can a	allow to us	se symbo	ls rather th	an numbers, for example;	Ordinance CvB,	
v(oldaan), g(oed), n(iet)v(ol)	d(aan), etc	.). In cas	e a studen [.]	t does not take part in any	see appendix 3	
(interim) examination, the e						

Article 3.7 Exemption

1.	 At the written request of the student, the Examination Board may exempt the student from taking one or more examination components, if the student: a) has passed a course component of a university or higher professional education programme that is equivalent in terms of content and level; b) has demonstrated through their work and/or professional experience that the 	Advice OLC; approval FGV (7.13 r)
	student has sufficient knowledge and skills with regard to the relevant course component.	
2.	The Master's thesis, the final work placement (c.q. internship) and the final project (c.q. final paper) are excluded from this exemption possibility.	Advice OLC; approval FGV (9.38 sub b)
3.	A maximum of 18 EC for a one-year master programme and 36 EC for a one two-year master programme can be accumulated through granted exemption. The substituting courses (educational components) are not included. This regulation does not apply if a student is (simultaneously) enrolled in multiple programmes, which lead to multiple degrees, where courses may be part of both programmes. The Examination Board may decide to deviate from this regulation for a programme.	Advice OLC,

Article 3.8 Validity period for results

1.	The validity period of interim examinations passed and exemption from interim	Legal provision
	examinations is unlimited, unless otherwise specified in Section B.	
2.	The validity period of a partial examination is limited to the academic year in which it was sat or until the end of the unit of study concerned, as stipulated for the relevant unit of study in Section B.	Advice OLC; approval FGV (9.38 sub b)

Article 3.9 Right of inspection and post-examination discussion

1.	Within twenty working days after the announcement of the results of a written interim examination, the student can, on request, inspect their assessed work, the questions and assignments set in it, as well as the standards applied for marking. The place and time will be announced at the time of the interim examination or on VUnet or Canvas.	Advice OLC; approval FGV (7.13 p en q)
2.	If a collective post-examination discussion has been organized, individual post- examination discussions will be held only if the student has attended the collective discussion or if the student was unable to attend the collective discussion through no fault of their own.	Advice OLC; approval FGV (7.13 q)
3.	Students who meet the requirements stipulated in paragraph 2 can submit a request for an individual post-examination discussion to the relevant examiner. The discussion shall take place at a time and location to be determined by the examiner.	Advice OLC; approval FGV (7.13 p en q)



4. Academic student counselling and study progress

Article 4.1 Administration of study progress and academic student counselling

1.	The faculty board is responsible for the correct registration of the students' study	Advice OLC;
	results. After the assessment of an educational component has been registered, every	approval FGV (7.13 u)
	student has the right to inspect the result for that component and also has a list of the	(7.15 u)
	results achieved at their disposal in VUnet.	
2.	Enrolled students are eligible for academic student counselling. Academic student	Advice OLC;
	counselling is in any case provided by	approval FGV (7.13 u)
	a. The Student General Counselling Service	(7.15 u)
	b. Student psychologists	
	c. Faculty academic advisors	

Article 4.2 Facilities for students with a disability

	- +.2 Fucilities for stadents with a disability	
1.	instance, submit a request to qualify for one or more special facilities with regard to teaching, practical training and interim examinations. These facilities will accommodate the student's individual disability as much as possible, but may not alter the quality or degree of difficulty of a unit of study or an examination. In all	Advice OLC; approval FGV (7.13 m)
2.	cases, the student must fulfil the exit qualifications for the study programme. The request referred to in the first paragraph must be accompanied by a statement from a doctor or psychologist. If possible, an estimate should be given of the potential impact on the student's study progress. In case of a chronic disability a single (one time) request suffices.	Advice OLC; approval FGV (7.13 m)
3.	Students who have been diagnosed with dyslexia must provide a statement from a BIG, NIP or NVO registered professional who is qualified to conduct psychological evaluation.	Advice OLC; approval FGV (7.13 m)
4.	The faculty board, or the responsible person on behalf of the faculty board, decides on teaching facilities and facilities regarding logistics. The Examination Board will rule on requests for facilities with regard to examinations.	Advice OLC; approval FGV (7.13 m)
5.	In the event of a positive decision in response to a request as referred to in paragraph 1, the student can make an appointment with the academic advisor to discuss the details of the provisions.	Advice OLC; approval FGV (7.13 m)
6.	A request for one or more facilities can be refused if it would place a disproportionate burden on the organization or the resources of the faculty or university were it upheld.	Advice OLC; approval FGV (7.13 m)
7.	If the disability justifies an extension of the interim examination time, the responsible person on behalf of the Examination Board will register in SAP this entitlement to an extension. If a disability justifies other measures to be taken, the Examination Board will advise the Faculty Board on the necessary measures to be taken. The student can consult the study monitor to check which facilities have been granted.	Advice OLC; approval FGV (7.13 m)
8.	The decision as referred to in paragraph 5 is valid for a maximum period of one year with the exception for the chronic diseases and disabilities.	Advice OLC; approval FGV (7.13 m)



5. Hardship clause

Article 5.1 Hardship clause

In instances not regulated by the Teaching and Examination Regulations or in the event of	Advice OLC;
demonstrable extreme unreasonableness and unfairness, the faculty board responsible for	approval FGV
the study programme will decide, unless the matter concerned is the responsibility of the	(9.38 sub b)
Examination Board.	



Section B1: Programme specific – general provisions

6. General programme information and characteristics

Article 6.1 Study programme information

1.	The programme Stochastics and Financial Mathematics CROHO number 60801 is	Advice OLC;
	offered on a full-time and part-time basis.	approval FGV
		(7.13 i)

Article 6.1a Deviant size of educational component

By way of derogation from art. 2.1 par. 3, the course Scientific Writing in English (X_400512) has a deviant size of 3 EC. Also units offered by Mastermath may have a deviant size of 8 EC.	Approval OLC (art. 7.13 lid 2, under e), approval CvB

Article 6.2 Teaching formats used and modes of assessment

1.	The programme uses the teaching formats as specified in the study guide.	Advice OLC; approval FGV (7.13 x)
2.	The modes of assessment used per educational component are specified in the study	Advice OLC;
	guide.	approval FGV (7.13 l)

Article 6.3 Academic student counselling

1.	The programme offers the following counselling in addition to the student	Advice OLC;
	counselling mentioned in Section A:	approval FGV
	- Not applicable	(7.13 u)

7. Further admission requirements

Article 7.1 Intake date(s)

1.	The programme starts twice a year: on September 1 and on February 1.	Advice OLC;
		approval FGV
		(9.38 sub b)

Article 7.2 Admission requirements

1.	obt	mission to the Master's programme is possible for an applicant who has cained a Bachelor's degree at an institution of academic higher education,	Partly legal provison & ordinance CvB, see
	wh	ich demonstrates the following knowledge, understanding and skills:	appendix 3. Admission
	a.	Equivalent to a Bachelor's degree in Mathematics or Technical Mathematics	requirements
		or (with sufficient mathematical content) in Business Analytics or	excepted from
		Econometrics or Actuarial Sciences, and whose English-language proficiency is	participation in
		at least equivalent to pre-university final exam level (VWO in the	WHW
		Netherlands).	
	b.	An applicant with a university degree in a field other than specified in	
		paragraph 7.2.1.a may be admitted to the programme by the Examination	
		Board if the following conditions are met:	



	i.	the applicant's prior education, including any supplementary work,	
		contains at least 90 credits of mathematics;	
	ii.	the applicant has reached a final attainment level in stochastics equivalent	
		to the Bachelor's degree in Mathematics as taught at VU University	
		Amsterdam;	
	iii.	the applicant's prior education meets the qualification of a university	
		Bachelor's degree programme as defined in the Dublin descriptors;	
	iv.	the applicant's English language proficiency is at least equivalent to pre-	
		university final exam level (VWO in the Netherlands).	
2.		ants who wish to follow the track must, in addition to the provisions in raph 1, also meet the following requirements with regard to: Not applicable.	Partly legal provison & ordinance CvB, see appendix 3. Admission requirements excepted from participation in WHW
3.	Applic	ants with a bachelor's degree obtained at an institution outside the	Advice OLC;
	Nethe	rlands may be asked for additional methods to prove that they meet the	approval FGV
		sion requirements.	(9.38 sub b)
4.	An ap	plicant should demonstrate sufficient level of proficiency in English by	Advice OLC;
	meeti	ng at least one of the following standards, no more than two (2) years	approval FGV
	befor	e the start of the programme at the VU: Not applicable.	(9.38 sub b)
5.	Applic	ants are exempted from the requirements referred to in paragraph 4: Not	Advice OLC;
	applic	able.	approval FGV
			(9.38 ub b)
6.	The A	dmission Board will decide whether the applicant meets the admission	Advice OLC;
	requi	ements.	approval FGV
			(9.38 sub b)

Article 7.3 Selection criteria

1.	In addition to the admission requirements referred to in Article 7.2, the Faculty board	Partly legal
	also sets (at least two of) the following selection criteria: Not applicable.	provision &
		ordinance CvB,
		see appendix 3.
		Admission
		requirements
		excepted from
		participation in
		WHW

Article 7.4 Pre-Master's programme

ſ	1.	Applicants with a Bachelor's degree of a university of applied science (HBO) or a	Advice OLC;
		Bachelor's degree from an institution of academic higher education who wish to enter	approval FGV
		the programme but do not fulfill the admission requirements as stipulated in Article	(9.38 sub b)



	7.2 can request admission to the pre-Master's programme.	
2.	Further conditions and the procedure are set out in the relevant Pre-Master	Advice OLC;
	regulation of the faculty.	approval FGV
	-0	(9.38 sub b)

8. Interim examinations and results

Article 8.1 Sequence of interim examinations

1.	Before starting the Master Project Stochastics and Financial Mathematics	Advice OLC;
	(X_400502), the student must have earned all other programme credits except a	approval FGV (7.13 h, s & t)
	shortfall of 8 EC is permissible.	(7.13 11, 3 & 1)

Article 8.2 Validity period for results

1.	As laid down in Article 3.8.	Advice OLC;
		approval FGV
		(7.13 k)
2.	A student may request the Examination Board to extend the validity of an exam. If the	Legal provision
	exam shows that a student's knowledge is insufficient or outdated, or if the student's	
	skills and insights evaluated in the exam are demonstrably outdated, the Examination	
	Board may impose a supplementary examination, impose a replacement examination	
	or refuse to extend the period of validity.	
3.	In situations where a limited period of validity applies, the period of validity of	Legal provision
	examinations may be extended in the event of extenuating circumstances as	
	stipulated in WHW Article 7.51, paragraph 2, with at least the period of allocated	
	financial assistance specified in WHW Article 7.15, paragraph 1.	



Section B2: Programme specific – content of programme

9. Programme objectives, tracks/specializations, exit qualifications and language

Article 9.1 Workload

1.	The programme has a workload of 120 EC.	Advice OLC;
		(7.13 a)

Article 9.2 Tracks and/or specializations

The programme has the following specializations:	Approval OLC;
- Data Science;	(7.13 a)
- Financial Mathematics.	

Article 9.3 Programme objective

The programme aims are for the student to acquire sufficient knowledge, skills and insight	Advice OLC;
within the field of Stochastics and Financial Mathematics, and any related disciplines, to	(7.13 a)
be able to operate as an independent professional at an academic level, and to be a	
suitable candidate for a subsequent course of study leading to a career in research or	
development. Another aim of the programme is to develop students' understanding of the	
interrelationships between academic disciplines, as well as their sense of social	
responsibility.	

Article 9.4 Exit qualifications

1.	The graduate:	Approval OLC
1.	 has thorough theoretical and practical knowledge of the fields of Modern Probability, Statistics and Stochastic Operations Research and their application in financial mathematics, the life sciences or in industry, for example; has insight into the development and the heuristics of modern mathematics, especially Stochastics, and has gained research experience in an area of Stochastics; is capable of becoming conversant in other sub-fields of Stochastics within a reasonable period of time; is capable of formulating a plan for a research project based on a broad research question; is capable of analysing and formulating research results, and of drawing conclusions from them; is capable of studying the professional literature (including international publications) in relevant sub-fields, and of utilizing the relevant content; is capable of applying knowledge of Stochastics in a broader (multidisciplinary) context, and has experience of using probabilistic models to examine problems in fields such as economics, biology or physics; has sufficient knowledge of, and insight into, the social role of Stochastics and Financial Mathematics to decide on a responsible choice of profession and 	Approval OLC (7.13 c)
	 professional practice; is capable of cooperating with others, of imparting knowledge to others, and of 	
	delivering a lecture both to specialists and to a wider audience. The graduate who focuses on scientific research is able to	



	 study and combine mathematical literature from various sources, and augment the field of mathematics with contributions of their own; contextualize the results and conclusions obtained, within the framework of results obtained by others. 	
	 The graduate focuses on applications of Stochastics in a business setting or for an organization is able to: define a solution-based scientific question from a problem of a quantitative and/or stochastic nature in the organization or business; 	
	 implement such questions in the form of targeted research; interpret and present data obtained from analyses conducted on different scales and different levels of abstraction. 	
2.	Not applicable.	Approval OLC (7.13 b)
3.	Language proficiency may be taken into account in the assessment of (interim) examinations	Approval OLC (7.13 c)

Article 9.5 Language of instruction

1.	The language of instruction is English.	Approval OLC (9.18)
2.	The 'Gedragscode vreemde taal' (code of conduct foreign languages) applies	Ordinance CvB, see appendix 3

10. Curriculum structure

Article 10.1 Composition of the programme

1.	The programme comprises at least a package of compulsory components and an individual Master's thesis or academic internship.	Ordinance CvB, see appendix 3
2.	Additionally the programme can offer: - electives	Advice OLC; (7.13 a)
3.	Educational components are categorized as specialized (400), research oriented (500) and highly specialized (600) level.	Ordinance CvB, see appendix 3
4.	The programme comprises at most two 300-level (advanced bachelor level) courses in total.	Advice OLC; (7.13 a)

Article 10.2 Compulsory educational components

A detailed description per educational component can be found in the Study Guide.

Compulsory for both spe	cializations			
Educational component	course code	nr of EC	level	Advice OLC;
Master Project Stochastics and Financial	XM_400502	36	600	(7.13 a)
Mathematics				
Master Seminar in Stochastics	XM_41011	6	400	
Measure Theoretic Probability	XMM_400244	8	400	1
Scientific Writing in English	X_400512	3	400	

Constrained choice for Data Science: at least 2 out of 3				
Educational component	course code	nr of EC	level	Advice OLC;



Advanced Machine Learning	XM_0010	6	400	(7.13 a)
Dynamic Programming and Reinforcement Learning	XM_0093	6	400	
Statistical Models	X_400418	6	400	

Constrained choice for Financial Mathematics: at least 2 out of 4				
Educational component	course code	nr of EC	level	Advice OLC;
Interest Rate Models	X_418091	6	500	(7.13 a)
Portfolio Theory	X_400535	6	500	
Stochastic Processes for Finance	X_400352	6	400	

Article 10.3 Elective educational components

the Examination Board:				(7.13 a)
Educational component	course code	nr of EC	level	
Advanced Machine Learning	XM_0010	6	400	-
Advanced Topics in Stochastic Analysis	XMU_0019	6	400	
Applied Analysis: Financial Mathematics	X_400076	6	400	
Applied Stochastic Modeling	X_400392	6	400	
Asymptotic Statistics	XMM_400323	8	500	
Bayesian Statistics	XMM_40004	8	400	
Computational Finance	XMU_418045	6	400	
Data-driven Decision Making in Operations		6	400	
Research	XMU_0026			
Dynamic Programming and Reinforcement		6	400	1
Learning	XM_0093			
Entrepreneurship in Analytics and AI	XM_0090	6	400	
Ergodic Theory	XMM_418138	8	400	
Forensic Probability and Statistics	XMM_0005	8	400	
Functional Analysis	XMM_400328	8	500	
Interest Rate Models	X_418091	6	500	
Machine Learning Theory	XMM_0002	8	400	
Optimization of Business Processes	X_400422	6	400	
Partial Differential Equations	XMM_400330	8	500	
Performance of Networked Systems	X_405105	6	400	
Portfolio Theory	X_400535	6	500	
Queueing Theory	XMM_400397	6	400	
Queues and Levy Fluctuation Theory	XMU_0002	6	400	
Simulation Methods in Statistics	X_400258	6	400	
Statistical Models	X_400418	6	400	1
Statistics for High-Dimensional Data*)	X_405113	6	400	
Statistics for Networks **)	X_405110	6	600	
Stochastic Integration	XMM_400470	8	400	
Stochastic Networks	XMU_0018	6	400	
Stochastic Processes	XMM_400339	8	400	
Stochastic Processes for Finance	X_400352	6	400	
Stochastic Simulation	XMU_0001	6	400]



Tim	ne Series	XMM_400571	8	400	
-	*) not in 2020-2021, taught every other year **) taught every other year				
2.	2. If the student wishes to take a different educational component than listed, advance			Advice OLC;	
	permission must be obtained in writing from the	ne Examination Boa	rd.		(7.13 a)
3.	The student can choose (at most) 12 EC of elec	tives outside of ma	thematics.		Advice OLC;
					(7.13 a)

Article 10.4 Practical exercise Not applicable

Article 10.5 Participation in practical training and tutorials

Not applicable

11. Evaluation and transitional provisions

Article 11.1 Evaluation of the education

1.	The education provided in this programme is evaluated in accordance with the	Approval OLC
	document 'Kwaliteitszorg Onderwijs BETA'.	(7.13 a1)

Article 11.2 Transitional provisions

By way of departure from the Teaching and Examination Regulations currently in force, the				
following transitional provisions apply for students who started the programme under a	(7.13 a)			
previous set of Teaching and Examination Regulations:				
- For the students who have earned the credits of Master Seminar in Stochastics and				
Financial Mathematics (XM_0056), Master Seminar in Stochastics (XM_41011) is				
not compulsory.				

Advice and approval by the Programme Committee, on June 9th, 2020.

Approved by the Faculty Joint Assembly, on June 16th, 2020.

Adopted by the board of the Faculty of Science on July 17th, 2020.



Appendix I

Overview of articles that must be included in the OER

Based on Article 7.13, paragraph 2, of the WHW and other Articles of the Act.

Section A: Faculty section

2. Study programme structure					
Article 2.1 Structure of academic year and educational components	7.13 paragraph 2 sub e				
3. Assessment and Examination					
Article 3.2 Type of examination	7.13 paragraph 2 sub h, l, j				
Article 3.3 Oral interim examinations	7.13 paragraph 2 sub l, n				
Article 3.4 Determining and announcing results	7.13 paragraph 2 sub o				
Article 3.5 Examination opportunities	7.13 paragraph 2 sub h, j				
Article 3.7 Exemption	7.13 paragraph 2 sub r				
Article 3.8 Validity period for results	7.13 paragraph 2 sub k				
Article 3.9 Right of inspection and post-examination discussion	7.13 paragraph 2 sub p, q				
4. Academic student counselling and study progress					
Article 4.1 Administration of study progress and academic student counselling	7.13 paragraph 2 sub u				
Article 4.2 Facilities for students with a disability	7.13 paragraph 2 sub m				

Section B1: Programme specific – general provisions

6. General programme information and characteristics			
Article 6.1 Study programme information 7.13 paragraph 2 sub i			
Article 6.2 Teaching formats used and modes of assessment	7.13 paragraph 2 sub l, x		
[option:] Article 6.3 Academic student counselling 7.13 paragraph 2 sub			
7. Further admission requirements			
Article 7.2 Admission requirements	7.30b paragraph 1		
Article 7.3 Selection criteria7.30b paragraph 2, 5			
8. Interim examinations and results			
Article 8.1 Sequence of interim examinations	7.13 paragraph 2 sub h, s, t		
[option 1:] Article 8.2 Validity period for results	7.13 paragraph 2 sub k		
[option 2:] Article 8.2 Validity period for results	7.13 paragraph 2 sub k		

Section B2: Programme specific – content of programme

9. Programme objectives, tracks/specializations, exit qualifications and land	nguage		
Article 9.1 Workload	7.13 paragraph 2 sub g		
Article 9.2 Tracks and/or specializations	7.13 paragraph 2 sub a		
Article 9.3 Programme objective	7.13 paragraph 2 sub a		
Article 9.4 Exit qualifications	7.13 paragraph 2 sub b, c		
Article 9.5 Language of instruction	9.18 (implementation		
	expected in 2020)		
10. Curriculum structure			
Article 10.1 Composition of the programme	7.13 paragraph 2 sub a		
Article 10.2 Compulsory educational components	7.13 paragraph 2 sub a		
[Optional] Article 10.3 Elective educational components	7.13 paragraph 2 sub a		
[Optional] Article 10.4 Practical exercise	7.13 paragraph 2 sub d		
Article 10.5 Participation in practical training and tutorials	7.13 paragraph 2 sub d		
11. Evaluation and transitional provisions			
Article 11.1 Evaluation of the education	7.13 paragraph 2 sub a1		
Article 11.2 Transitional provisions 7.13 paragraph 2			



Appendix II

Overview of advisory and approval rights of Programme Committees (OLC) and Faculty Joint Assembly (FGV) *(English underneath)*

Onderwerpen Onderwijs – en Examenregeling (OER) 7.13 lid 2 WHW		FGV		OplC	
		Α	1	Α	
a. de inhoud van de opleiding en van de daaraan verbonden examens					
a1. de wijze waarop het onderwijs in de desbetreffende opleiding wordt geëvalueerd					
b. de inhoud van de afstudeerrichtingen binnen een opleiding					
c. de kwaliteiten op het gebied van kennis, inzicht en vaardigheden die een student zich bij beëindiging van					
de opleiding moet hebben verworven					
d. waar nodig, de inrichting van praktische oefeningen					
e. de studielast van de opleiding en van elk van de daarvan deel uitmakende onderwijseenheden					
f. de nadere regels, bedoeld in de artikelen 7.8b, zesde lid, en 7.9, vijfde lid (BSA)					
g. ten aanzien van welke masteropleidingen toepassing is gegeven aan artikel 7.4a, achtste lid (verhoogde studielast)					
h. het aantal en de volgtijdelijkheid van de tentamens alsmede de momenten waarop deze afgelegd kunnen					
worden					
i. de voltijdse, deeltijdse of duale inrichting van de opleiding					
j. waar nodig, de volgorde waarin, de tijdvakken waarbinnen en het aantal malen per studiejaar dat de					
gelegenheid wordt geboden tot het afleggen van de tentamens en examens					
k. waar nodig, de geldigheidsduur van met goed gevolg afgelegde tentamens, behoudens de bevoegdheid van					
de examencommissie die geldigheidsduur te verlengen					
l. of de tentamens mondeling, schriftelijk of op een andere wijze worden afgelegd, behoudens de					
bevoegdheid van de examencommissie in bijzondere gevallen anders te bepalen					
m. de wijze waarop studenten met een handicap of chronische ziekte redelijkerwijs in de gelegenheid worden					
gesteld de tentamens af te leggen					
n. de openbaarheid van mondeling af te nemen tentamens, behoudens de bevoegdheid van de					
examencommissie in bijzondere gevallen anders te bepalen					
o. de termijn waarbinnen de uitslag van een tentamen bekend wordt gemaakt alsmede of en op welke wijze					
van deze termijn kan worden afgeweken					
p. de wijze waarop en de termijn gedurende welke degene die een schriftelijk tentamen heeft afgelegd,					
inzage verkrijgt in zijn beoordeelde werk					
q. de wijze waarop en de termijn gedurende welke kennis genomen kan worden van vragen en opdrachten,					
gesteld of gegeven in het kader van een schriftelijk afgenomen tentamen en van de normen aan de hand					
waarvan de beoordeling heeft plaatsgevonden					
r. de gronden waarop de examencommissie voor eerder met goed gevolg afgelegde tentamens of examens in					
het hoger onderwijs, dan wel voor buiten het hoger onderwijs opgedane kennis of vaardigheden, vrijstelling					
kan verlenen van het afleggen van een of meer tentamens					
s. waar nodig, dat het met goed gevolg afgelegd hebben van tentamens voorwaarde is voor de toelating tot het afleggen van andere tentamens					
t. waar nodig, de verplichting tot het deelnemen aan praktische oefeningen met het oog op de toelating tot					
het afleggen van het desbetreffende tentamen, behoudens de bevoegdheid van de examencommissie					
vrijstelling van die verplichting te verlenen, al dan niet onder oplegging van vervangende eisen					
u. de bewaking van studievoortgang en de individuele studiebegeleiding					
v. indien van toepassing: de wijze waarop de selectie van studenten voor een speciaal traject binnen een					
opleiding, bedoeld in artikel 7.9b, plaatsvindt (excellentietraject binnen een opleiding)					
x. de feitelijke vormgeving van het onderwijs					
alle overige onderwerpen die in de OER zijn geregeld maar die niet als zodanig zijn genoemd in art. 7.13 WHW					
onder a t/m x. De letterina komt overeen met de letterina van artikel 7.13 lid 2 WHW					

De lettering komt overeen met de lettering van artikel 7.13 lid 2 WHW

Afkortingen:

- FGV: Facultaire Gezamenlijke Vergadering
- OplC: Opleidingscommissie
- I: Instemmingsrecht
- A: Adviesrecht



Appendix II (English)

Overview of advisory and approval rights of Programme Committees (OLC) and Faculty Joint Assembly (FGV) *Disclaimer: this is a translation which only serves as an aid. No rights may be derived from it. The Dutch document prevails.*

Article 7.13, paragraph 2, of the Higher Education and Research Act	FG	/	Ор	OplC	
		Α	Ι	Α	
a. content of the programme and associated examinations					
a1. the manner in which teaching and education in the relevant programme are evaluated					
b. the content of the specializations offered as part of the programme					
c. the programme's final attainment levels with regard to the knowledge, understanding and skills					
d. where applicable, the design of practical exercises					
e. the study load of the programme and of each of its constituent educational units					
f. the detailed rules referred to in Article 7.8b, sixth paragraph, and Article 7.9, fifth paragraph (recommendation on continuation of studies)					
g. the Master's programmes to which Article 7.4a, eighth paragraph, applies (elevated study load)				Γ	
h. the number and sequence of examinations and the times at which these can be taken					
i. the full-time, part-time or work-study structure of the programme				i i	
j. where necessary, the order, and the periods in which and the number of times per academic year that the opportunity to sit examinations and final degree assessments is given					
k. where necessary, the period of validity for pass grades awarded for examinations, notwithstanding the authority of the Examination Board to extend this period of validity					
I. whether examinations are administered in oral, written or another form, notwithstanding the authority of the Examination Board to decide otherwise					
m. the way in which students with a disability or chronic health condition are given a reasonable opportunity to take the examinations					
n. the public nature of oral examinations, subject to the right of the Examination Board to determine otherwise in special cases					
o. the period within which the results of an examination must be announced, together with details of whether this period can be altered and if so in what way					
p. the way in which and the period within which students who have taken an examination are given the opportunity to inspect their marked work					
q. the way in which and the period within which information can be provided about the questions asked and exercises given in the framework of a written examination and about the standards used for assessment					
r. the grounds on which the Examination Board could grant exemption from the taking of one or more examinations to students who have previously passed examinations in higher education or have acquired knowledge or skills outside higher education					
s. where necessary, the stipulation that students must pass certain examinations as a condition for admission to other examinations					
t. where necessary, the obligation to take part in certain practical exercises with a view to admission to the examination in question, subject to the authority of the Examination Board to grant exemption from this obligation, with or without the imposition of alternative requirements					
u. the monitoring of academic progress and individual student support and guidance;					
v. where applicable, the manner in which students are selected for a special track within a programme as referred to in Article 7.9b (excellence track within a programme)					
x. the actual design of the education provided.					
All other matters that are regulated in the Academic and Examination Regulations but which are not mentioned as such in Article 7.13 of the Higher Education and Research Act under points a to x.					

Abbreviations used:

- FGV: Faculty Joint Assembly
- OLC: Programme Committee
- I: right of approval
- A: right of advice



Appendix III

Ordinances VU CvB and Binding Guidelines (richtlijn)

Section A, article:	Concerns:	CvB ordinance / guideline
2.1.1, 2.1.2	Year planning two semesters 8-8-4 (uniforme jaarkalender VU-UvA)	29-9-2008 (period 2009-2015) 22-05-2014 (periode 2016-2025)
2.1.3, 2.1.4	Educational components	Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017
3.1	Signing up for education and interim examinations	CvB ordinance 30-09-2010, prior consent USR.
3.4.1	Determination and publication of the results (1) Grading deadline exams 10 workdays (2) Theses 20 workdays	 (1) Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017 ((2) Quality demand 11 from the VU assessment policy, CvB ordinance 15-05-2012
3.5.1	Two possibilities to take examinations per year	Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017
3.5.2	Retake: most recent grade is valid. A pass can be retaken	Taken from the UvA guidelines, as part of the harmonization, CvB ordinance 24-02-2014
3.5.4	Extra retake last year	Included in (prior) model OER 16-17 following a request from committee O&O and adopted by CvB op 27-10-2015
3.6	Grades	CvB ordinance 30-09-2010, with University council's consent. As a result of harmonization UvA, the guideline: 5.5 is a pass, has been added. CvB ordinance 24-02-2014.
Section B1, article:	Concerns:	CvB ordinance / guideline
7.2	Admission criteria; at least WO Bachelor's degree	Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017
7.3	Selection criteria; type of criteria	Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017
Section B1, article:	Concerns:	CvB ordinance / guideline
10.1	Composition programme	Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017
10.2	Categorization of components	Richtlijn Bachelor en Masteronderwijs, revised on 6 June 2017



Appendix IV

Article 2.1 of the Higher Education and Research (Implementation) Act (*Uitvoeringsbesluit*) Entered into force on 1 June 2018

(English underneath)

1 De persoonlijke omstandigheden bedoeld in de artikelen 7.8b, derde lid, en 7.9, derde lid, van de wet, zijn uitsluitend:

- a. ziekte van betrokkene,
- b. lichamelijke, zintuiglijke of andere functiestoornis van betrokkene,
- c. zwangerschap van betrokkene,
- d. bijzondere familie-omstandigheden,
- e. het lidmaatschap, daaronder begrepen het voorzitterschap, van:

1. bij universiteiten: de universiteitsraad, faculteitsraad, het orgaan dat is ingesteld op grond van de medezeggenschapsregeling, bedoeld in artikel 9.30, derde lid, onderscheidenlijk artikel 9.51, tweede lid, van de wet, het bestuur van een opleiding of de opleidingscommissie, alsmede het lidmaatschap van het bestuur van een stichting die blijkens haar statuten tot doel heeft de exploitatie van voorzieningen, behorende tot de studentenvoorzieningen, dan wel van een daarmee naar het oordeel van het instellingsbestuur gelet op de taak gelijk te stellen orgaan,

2. bij hogescholen: de medezeggenschapsraad, deelraad, studentencommissie of opleidingscommissie.

f. andere in de regelingen, bedoeld in de artikelen 7.8b, zesde lid, en 7.9, vijfde lid, van de wet door het instellingsbestuur aan te geven omstandigheden waarin betrokkene activiteiten ontplooit in het kader van de organisatie en het bestuur van de zaken van de instelling,

g. het lidmaatschap van het bestuur van een studentenorganisatie van enige omvang met volledige rechtsbevoegdheid, dan wel van een vergelijkbare organisatie van enige omvang, bij wie de behartiging van het algemeen maatschappelijk belang op de voorgrond staat en die daartoe daadwerkelijk activiteiten ontplooit.

2 Het instellingsbestuur kan voor de toepassing van het eerste lid, onderdeel g, nadere regels vaststellen omtrent het aantal bestuursleden dat ten hoogste per organisatie per studiejaar in aanmerking komt, zomede omtrent welke bestuursfuncties in aanmerking komen.



Appendix IV (English)

Article 2.1 of the Higher Education and Research (Implementation) Act Entered into force on 1 June 2018

Disclaimer: This is a translation which only serves as an aid. No rights may be derived from it. The Dutch document prevails.

1. The extenuating personal circumstances referred to in Article 7.8b, paragraph 3 and 7.9, paragraph 3 of the Act (WHW) are limited to:

- a. illness of the person concerned,
- b. physical, sensory or other impairment of the person concerned,
- c. pregnancy of the woman concerned,
- d. extenuating family circumstances,
- e. membership, including the chairmanship of:

 at universities: the university council, faculty council, the body established under the participation regulation referred to in Article 9.30, paragraph 3 or Article 9.51, paragraph 2 of the Act, the programme management or the Programme Committee, or membership on the board of a foundation whose bylaws allow for the exploitation of facilities belonging to the student services, or an equivalent body with regard to its activities in the opinion of the board of the institution,
 at universities of applied science: the participation council, district council, student committee or Programme Committee.

f. other circumstances to be designated by the board of the institution in the regulation as referred to in Article 7.8b, paragraph 6 and Article 7.9, paragraph 5 of the Act in which the person concerned engages in activities within the framework of the organization and the administration of the affairs of the institution, g. membership on the board of a student organization of any size with full legal capacity, or a similar organization of any size, whose primary task regards general societal interest and which actually develops activities for this purpose.

2. The institutional board may, for the purposes of the first paragraph, part g, establish specific rules regarding the maximum number of eligible board members per organization per academic year, as well as the eligible administrative offices.



Appendix V

Addendum to the 2020-2021 Academic and Examination Regulations Master's degree programmes

Several articles for the 2020-2021 academic year will be temporarily suspended or amended as a result of the consequences of the measures to stop the spread of COVID-19. These amendments apply exclusively to the 2020-2021 academic year, which ends 31 August 2021. In this regard, reference is also made to the addendum to the Application and Registration Regulations for the 2020-2021 academic year.

Part B1 Programme-specific section

Article 7.2 Admission requirements

Supplementary to Article 7.2.1, students* are also admissible for the 2020-2021 academic year (start date September 2020) if, at the latest by 31 August 2020

they have earned at least 150 EC of the Bachelor's programme (university in The Netherlands or EEA (European Economic Area)) that confers entitlement to admission, under the following conditions:

- The Bachelor's degree certificate must still be obtained before 1 September 2021 or before the Master's degree certificate is obtained, whichever comes first. If this condition is not met, the student will not be able to continue or complete the Master's programme.
- Additional admission requirements (not EC related) remain applicable.

they have earned at least 24 EC of the bridging or pre-Master's programme, under the following conditions:

- The bridging or pre-Master's programme must still be successfully completed before 1 September 2021 or before the Master's degree certificate is obtained, whichever comes first. If this condition is not met, the student will not be able to continue or complete the Master's programme.
- Additional admission requirements (not EC related) remain applicable.

*The above supplements do not apply to non-EEA students who must complete a Bachelor's programme outside of the Netherlands.

Article 7.4 Bridging or pre-Master's programme

Supplementary to Article 7.4.1, students* are also admissible for the 2020-2021 academic year (start date September 2020) if, at the latest by 31 August 2020 they have earned at least 210 EC of the designated HBO Bachelor's programme, under the following conditions:

- The HBO Bachelor's diploma must still be obtained before 1 September 2021 or before the bridging or pre-Master's programme is completed, whichever comes first. If this condition is not met, the student will not be able to complete or continue the programme.
- Additional admission requirements (not EC related) remain applicable.

*The above supplements do not apply to non-EEA students who must complete a Bachelor's programme outside of the Netherlands.

