Study Regulations
Governing the Master's Degree Programme in Visual Computing

24 April 2025

Note: This translation is provided for information purposes only. In the event of any discrepancy between the translation and the original German version published in the Official Bulletin (*Dienstblatt der Hochschulen des Saarlandes*), the provisions of the latter shall take precedence.

Pursuant to Section 60(1), first sentence of the Saarland Higher Education Institutions Act (SHSG) (Official Gazette of Saarland I, p. 1080) most recently amended in law by Article 1 of the Act of 10 July 2024 (Official Gazette I, p. 555) and on the basis of the Joint Examination Regulations for Bachelor's and Master's Degree Programmes of the Faculty of Mathematics and Computer Science at Saarland University of 25 February 2021 (Official Bulletin No. 62, p. 580) and with the consent of the Saarland University Senate, the Faculty of Mathematics and Computer Science at Saarland University hereby issues the following Study Regulations Governing the Master's Degree Programme in Visual Computing.

Section 1
Scope

These study regulations, which govern the content and structure of the Master's degree programme in Visual Computing, are based on the Joint Examination Regulations for the Bachelor's and Master's Degree Programmes of the Faculty of Mathematics and Computer Science at Saarland University of 25 February 2021 (Official Bulletin No. 62, p. 580) and on the Subject-Specific Regulations Governing the Master's Degree Programme in Visual Computing of 5 June 2025 (Official Bulletin No. 100, p. 1058). The Faculty of Mathematics and Computer Science is responsible for organizing the teaching, curriculum and examinations relating to these programmes.

Section 2
Objectives of the degree programme and career relevance

As visual impressions are the most important form of human sensory perception, there is an increasing trend in computer-assisted information processing to replace text-based content with visual representations. The computer-aided processing of visual information is of central significance in telecommunications, the multimedia sector, industrial quality control, medical technology, driver assistance systems, pattern recognition problems in bioinformatics, scientific computation, augmented reality applications, data science, artificial intelligence, media design and in robotics.

The goal of the Master's degree programme in Visual Computing is to teach students the fundamental principles, processes and applications of computer-assisted processing of visual information. The programme, which is based at the Department of Computer Science, maintains interdisciplinary links to numerous other disciplines, particularly mathematics, physics and electrical engineering but also to medical engineering, biology, computer linguistics and the cognitive sciences.

Section 3
Start and duration of programme

(1) Students can begin the programme at the beginning of the winter or summer semester of each year.

(2) The curriculum is organized such that the programme can be completed in four semesters (standard period of study).

Section 4
Types of academic instruction

The curriculum content is taught using the following types of academic instruction:

1. Lectures ('V', standard class size = 100): Lectures serve to introduce a particular subject area and also provide an overview of the relevant theoretical concepts and principles, methodologies and skills, technologies and practical implementations that are common to the subject. Lecture courses provide suggestions for further reading on a topic and open the way to acquiring a deeper understanding of an area through subsequent exercise and problem-solving classes, practical skills classes and self-directed study.

2. Exercise and problem-solving classes ('Ü', standard class size = 20): Exercise and problem-solving classes are small-group sessions used primarily to supplement and reinforce what was learned in the lectures. Students work on representative problems as this provides an opportunity for them to apply and deepen the knowledge they acquired in the lectures, to assess their personal understanding of a specific area and to clarify any questions that they may have.

3. Seminars ('S', standard class size = 15) Seminars provide an opportunity for students to broaden the knowledge and skills that they have already acquired and to gain a deeper understanding of a particular field of research by participating in discussions, giving presentations or completing seminar assignments based on their study of the specialist literature and relevant academic sources. They also help students acquire the skills necessary for the effective oral and visual presentation of scientific and academic content and encourage students to engage in critical analysis and discussion of research results. A seminar may also include project-related work in areas of current scientific interest or debate. The deeper understanding of a particular field that students acquire through project-related work in the Master's seminar may provide the basis for their final-year Master's thesis.

4. Practical skills classes and project work ('P', standard class size = 15; Master's thesis project, standard class size = 10): Practical skills classes or projects offer a number of practical, subject-related topics that introduce students to the specific approaches and methods used in a particular discipline or field of study. The necessary theoretical knowledge underlying a specific topic is acquired by attending lectures and studying the relevant scientific literature. An additional goal of the practical skills classes is to provide students with the opportunity to gain practical experience with computer-aided methods. Projects tend to address interdisciplinary topics. Working on a topic offers students the opportunity to work in supervised groups to tackle specific assignments from the initial solution design concept through to its final practical implementation. Students learn about the relationships between theory and practice not only through their own independent study and research, but also through project-based teamwork. Participation in a particular practical skills class or project may be dependent on a student having first successfully completed a required course of lectures and exercise and

problem-solving classes.

Section 5
Structure and content of the programme

(1) To graduate from the Master's programme Visual Computing, students shall earn a total of 120 credits as defined by the European Credit Transfer System (ECTS). Of these, at least 106 credits and at most 110 credits shall be from graded assignments. As a rule, students are required to earn 30 credits per semester.

(2) The degree programme covers modules associated with the sections listed below. Appendix A provides details of the modules and module elements in each of these categories, the type of academic instruction used, the associated workload (number of credit hours per week), the ECTS credits earned, the type of academic assessment and whether the module is graded.

1. Students must earn 18 graded ECTS credits from the core lecture courses 'Visual Computing' (each worth 9 CP; mandatory elective). Of the 18 ECTS credits earned in this section, 9 credits must be earned either from the 'Computer Graphics' lecture course or from the 'Image Processing and Computer Vision' lecture course, unless the student can demonstrate that they have completed equivalent curricular content in a previous degree programme.

   If equivalent lecture courses were completed previously, e.g. during the student's Bachelor's degree programme, the credits required in this section can also be acquired by completing lecture courses from Section 5(2), items 2 and 3.

2. At least 12 and at most 18 graded credits must be earned in the 'Visual Computing' core lecture courses (each worth 9 credits; mandatory elective) or from the 'Visual Computing' advanced lecture courses (number of credits that can be earned depends on the course taken).

3. At least 21 and at most 28 graded credit points must be earned from the 'Wider Visual Computing' core lectures (each worth 9 credits; mandatory elective) or from the 'Wider Visual Computing' advanced lecture courses (number of credits earned depends on the course taken) or from the seminars in the field of Visual Computing (7 credits; mandatory elective). Note: no more than one additional seminar (cf. Sec. 5(2), item 3) and one additional core lecture course in the field of 'Wider Visual Computing' is permitted.

4. 7 graded credits from the Visual Computing seminars offered (each worth 7 credits; mandatory elective)

5. 12 graded credits from the 'Master's Seminar' module (12 credits)

6. 30 graded credits from the 'Master's Thesis' module (30 credits)

7. At least 14 ungraded credits from selectable modules in the following areas (mandatory elective section):
   a. Master's level practical assignments or projects (each worth 6 credits)
   b. Freely selectable modules from the following areas: core lecture courses in Visual Computing, advanced lecture courses in Visual Computing or seminars in Visual Computing or the corresponding module categories in the Master's degree programme in Computer Science
   c. Tutoring and supervising undergraduate students in exercise and problem-solving classes (usually 4 credits)
   d. Language courses (maximum of 6 credits; modern languages only and not the student's native language)
   e. Internship in industry (maximum of 6 credits) for which an application was submitted

to and approved by the Examination Board.

f. Modules for which an application has been submitted to and approved by the Examination Board. For example, students have the option of submitting an application to the Examination Board requesting recognition of certain student activities (particularly university-related administrative activities) or of attendance at courses teaching key skills (maximum of 3 credits in each case).

(3) Students may select either entire modules or individual module elements from the mandatory electives offered. Credits from academic assessments and examinations that were used to obtain the preceding Bachelor's degree cannot also be used to meet the degree requirements of the Master's programme. However, any credits from academic assessments and examinations that were earned during the Bachelor's degree period but that were not used to meet the total credit requirements for the Bachelor's programme may be transferred to the Master's programme provided that they do not exceed 30 credits in total.

(4) Students are required to accumulate a total of 42 credits in the mandatory section (of which 30 credits are from the 'Master's Thesis' module and 12 credits are from the 'Master's Seminar') and at least 78 credits in the mandatory electives section.

(5) The number of places available in practical skills classes, seminars and in the mandatory elective modules 'Tutoring' and 'Language Courses' are limited and vary depending on the specific module or module element. Admission to these modules is managed by the module coordinator.

(6) Academic credits are either graded or ungraded. A graded academic assessment or examination cannot be split into ungraded and graded credits.

(7) A student who received academic credits for successfully completing the core lecture courses Visual Computing and Wider Visual Computing is permitted to retake the assessment or examination on one further occasion within the standard period of study in order to improve the mark awarded (cf. Sec. 13(4) of the Examination Regulations). A student who has received academic credits for successfully completing an advanced lecture course in Visual Computing and Wider Visual Computing is permitted to retake the assessment or examination on one further occasion within the same examination period in order to improve the mark awarded, provided that the lecturer gave notice at the beginning of the course that the final examination or assessment may be repeated for this purpose. The student will be awarded the higher of the two grades achieved. In all other cases, students are not permitted to repeat an assessment or examination for which they have already achieved at least the minimum passing grade.

(8) The core lecture courses taken within the mandatory electives block are offered at least once every two years. Seminars and advanced lecture courses will not necessarily be repeated. The Dean of Studies will ensure that a sufficient number of modules are offered in each academic year.

(9) The language of instruction is usually English and will be announced at the beginning of each module or module element. The Master's programme is designed so that it can be completed successfully entirely through courses taught in English.

(10) The modules offered as mandatory electives may be modified, though any such change shall require the approval of the Examination Board. New or modified modules or module elements, their weighting in ECTS credits and their classification within the different sections

of the programme will be announced before the semester begins.

(11) Detailed information regarding the content of modules and module elements is provided in the module catalogue that will be made available in suitable form. Any changes or amendments to the information in the module catalogue not covered in these study regulations shall be reported to the Dean of Studies and documented in appropriate form.

(12) Course attendance may be compulsory for certain seminars, exercise and problem-solving classes, and practical skills classes. Students will be notified of this by the instructor at the beginning of the module or module element. The compulsory attendance requirement is normally deemed to have been met if a student was present for at least 85 per cent of the course sessions. If there are reasonable grounds for a student's absence, the student may be offered the option of completing alternative assignments.

Section 6
Study plan

The Dean of Studies shall compile a study plan based on these study regulations that includes details of the types and scope of the modules / module elements offered (Appendix A) with recommendations on how students can organize and structure their studies efficiently (Appendix B). The study plan will be made available in suitable form. The range of modules / module elements offered in the different module categories in a particular semester will be published in the Saarland University course catalogue for that semester.

Section 7
Study counselling

The Central Student Advisory Service (*Zentrale Studienberatung*) at Saarland University provides counselling and guidance to prospective students and enrolled students concerning the content, structure and requirements of academic study at Saarland University. It also can advise and assist students with respect to their study options as well as with planning and organizing their studies. (2) Questions concerning curricular demands, learning objectives, admission requirements and study planning and organization can be addressed to the programme adviser for the Master's programme in Visual Computing. Questions relating to individual modules can be addressed to the respective module coordinators.

Section 8
Studying abroad

Students have the opportunity to spend part of the programme studying abroad or conducting an internship in another country. Students interested in either of these options should attend a consultation session, take preparatory language courses if required, and should clarify credit transfer arrangements in accordance with the relevant examination regulations by completing a study abroad learning agreement. Information on study abroad opportunities, exchange programmes, scholarships and administrative formalities is available from the Saarland University International Office or from the relevant departmental or subject representative. As foreign host universities and scholarship-awarding bodies often have early application deadlines and long application processing times, study abroad applications should normally be submitted to the Examinations Office one year before the planned start date.

Section 9
Master’s thesis and Master’s seminar

(1) By completing a Master’s thesis, students demonstrate that they are able to work independently on tackling problems in the core discipline of visual computing. The completion period for the Master’s thesis is six months. Students are awarded 30 CP for completing their Master’s thesis.

(2) Before finishing their Master’s thesis, each student shall have successfully completed a Master’s seminar in an area with direct relevance to the topic being addressed in the thesis. Students attending a Master’s seminar shall give an oral presentation on the problem they propose to tackle in their Master’s thesis.

(3) Students shall register their thesis project with the Examinations Office no later than the end of the semester after the semester in which they successfully completed the Master's seminar. Students who fail to meet this deadline will be required to successfully complete another Master’s seminar.

Section 10
Commencement and Transitional Provisions

(1) This regulation shall come into force on the day after it is announced in the Official Bulletin of the Institutions of Higher Education in Saarland (*Dienstblatt der Hochschulen des Saarlandes*).

(2) Students who began studying for their Master’s degree in Visual Computing at the Faculty of Mathematics and Computer Science before these regulations entered into force shall continue to study under the regulations applicable at the time they began the programme, but shall complete their studies including the final academic assessment and examination phase by the end of summer semester 2028.

Saarbrücken, 12 November 2025

Univ.-Prof. Dr. Ludger Santen
President of Saarland University

Appendix A. Modules, assessments and examinations in the Master's degree programme 'Visual Computing'

Master's degree programme (M.Sc.) Visual Computing

						Winter semester		**Summer semester**		**Winter semester**		**Summer semester**	
						Subject semester							
Department / Institution	**Modules**	**Type of assessment**		**ECTS credits**		**1**		**2**		**3**		**4**	
			Grading	ungraded	graded	V / Ü / P hrs/wk	ECTS credits	V / Ü / P hrs/wk	ECTS credits	V / Ü / P hrs/wk	ECTS credits	L / EP / S hrs/wk	ECTS credits
Core lecture course in VC	(Modules in the core lecture courses in VC; each worth 9 credits, see below)	written exam(s), PVL	b	0	18	4 / 2 / 0	9			4 / 2 / 0	9		
Core lecture courses in VC or advanced lecture courses in VC	(modules offered subject to change, core (9 credits) or advanced lecture courses (variable credits))	written exam(s), PVL, oral, written	b	0	12-18			2 / 2 / 0	6				
								2 / 2 / 0	6	2 / 2 / 0	3		
Core lecture courses in Wider VC or advanced lecture courses in Wider VC or VC seminar	(variable credits, see list below)	written exam(s), PVL, oral, written	b	0	21-28	4 / 2 / 0	9	2 / 2 / 0	6				
						2 / 2 / 0	6	2 / 2 / 0	6				
Mandatory elective section: VC seminars*	(modules offered subject to change, each worth 7 credits)	oral, written	b	0	7					0 / 0 / 3	7		
Mandatory elective section: 'Freely selectable modules'	(modules offered subject to change, variable credits, see list below)		u	at least 14	0	2 / 2 / 0	6		5				
	Master's seminar	oral, written	b	0	12						12		
	Master's thesis	Master's thesis	b	0	30								30
TOTAL				**at least 14**	**106-110**		**30**		**29**		**31**		**30**

Core lecture courses in Core Visual Computing					
	Computer Graphics	written exam(s), PVL	b	0	9
	Image Processing and Computer Vision	written exam(s), PVL	b	0	9
	Human Computer Interaction	written exam(s), PVL	b	0	9
	Machine Learning	written exam(s), PVL	b	0	9
The Examination Board may add modules to or withdraw modules from this list.					

Advanced lecture courses in Core Visual Computing					
	Advanced Topics in Neural Rendering and Reconstruction	written exam(s), PVL	b	0	3
	Differential Equations in Image Processing and Computer Vision	written exam(s), PVL	b	0	9
	High-Level Computer Vision	written exam(s), PVL	b	0	6
	Realistic Image Synthesis	written exam(s), PVL	b	0	9
The Examination Board may add modules to or withdraw modules from this list. *					

Core lecture courses in 'Wider Visual Computing'					
	Convex Analysis and Optimization	written exam(s), PVL	b	0	9
	Cyber-Physical Systems	written exam(s), PVL	b	0	9
	Internet Transport	written exam(s), PVL	b	0	9

The Examination Board may add modules to or withdraw modules from this list.	Digital Transmission and Signal Processing	written exam(s), PVL	b	0	9

Advanced lecture courses in 'Wider Visual Computing'					
	Fundamentals of Signal Processing	written exam(s), PVL	b	0	6
	Optimization for Machine Learning	written exam(s), PVL	b	0	6
The Examination Board may add modules to or withdraw modules from this list. *					

Seminars in Visual Computing The Visual Computing seminars offered may vary from semester to semester. The Examination Board may add modules to or withdraw modules from this list. *		oral, written	b	0	7

Mandatory elective section: 'Freely selectable modules'					
	Tutoring		u	4	0
	Language courses (max. 6 credits)	oral, written	u	3 or 6	0
	Master's level practical assignments or projects (each worth 6 credits)		u	6	0
	Internship (max. 6 credits)		u	6	0
	Further modules from Visual Computing	written exam(s), PVL	u	variable	0
The Examination Board may add modules to or withdraw modules from this list.					

* The range of modules offered in these module categories varies from semester to semester and is published in the course catalogue. The Examination Board may add modules to or withdraw modules from this list.

Key:

V = Lecture,

Ü = Exercise and problem-solving class,

P = Project or practical training,

PVL = Preliminary assessment,

credits = ECTS credits

credit hrs/wk = no. of class or supervised hours per week during the semester

Appendix B

Sample study plan Master's Degree Programme in Visual Computing

1	Core Lecture in Visual Computing (9 credits)	Core Lecture in Wider Visual Computing (9 credits)		Advanced Lecture in Visual Computing (6 credits)	Mandatory Elective (6 credits)	30
2	Advanced Lecture in Visual Computing (6 credits)	Advanced Lecture in Visual Computing (6 credits)	Advanced Lecture in Wider Visual Computing (6 credits)	Advanced Lecture in Wider Visual Computing (6 credits)	Mandatory Elective (5 credits)	29
3	Core Lecture in Visual Computing (9 credits)	Advanced Lecture in Visual Computing (3 credits)		Seminar in Visual Computing (7 credits)	Master's Seminar (12 credits)	31
4	Master's Thesis (30 credits)					30