Module descriptions SPO 34

Study degree program: Optometry

Version dated **December 17, 2025**

The future in mind

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Note:
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Optometry degree program – mandatory modules

No.	Module / Courses	Type	Study Semester SWS							CP
			1.	2.	3.	4.	5.	6.	7.	
77001	**General Optics A**						Internship Semester			**5**
77101	General Optics 1	V,Ü,L	3							5
77102	General Optics 2	V,Ü,L	3							
77002	**Fundamentals of Natural Sciences A**									**5**
77103	Physiological Optics 1	V,Ü	2							5
77104	Chemistry, Biochemistry	V,Ü	2							
77003	**Fundamentals of Optometry**									**5**
77105	Fundamentals of Optometry	V,Ü,L	6							5
77004	**Applied Computer Science**									**5**
77106	Applied Computer Science	V,Ü,L	6							5
77005	**Technological and Scientific Fundamentals A**									**5**
77107	Workplace Optometry and Photometry 1	V,Ü,L	2							5
77108	Workplace Optometry and Photometry 2	V,Ü,L	2							
77006	**Digital Business Models/Start-up Management in Optometry**									**5**
77109	Digital Business Models/Start-up Management in Optometry	V,Ü, P	5							5
77007	**Management Skills for Optometrists (in English)**									**5**
77201	Management Skills for Optometrists (in English)	V,Ü, P		5						5
	Total SWS		**31**	**5**						
	Total CP		**30**	**5**						
	Total exams		**6**	**1**						

No	Module / Courses	Type	Study Semester SWS							CP
			1.	2.	3.	4.	5.	6.	7.	
							Internship Semester			
77008	**General Optics B**									**5**
77202	General Optics 3	V,Ü,L		3						5
77203	General Optics 4	V,Ü,L		3						
77009	**Fundamental of Natural Sciences B**									**5**
77204	Physiological Optics 2	V		2						5
77205	Fundamentals of Biostatistics	V,Ü		2						
77010	**Fundamentals of Natural Sciences C**									**5**
77206	Physiological Optics 3	V		4						5
77011	**Eyeglass Optics and Supply Laboratory**									**5**
77207	Optometry and Supply Laboratory	V,Ü,L		6						5
77012	**Optometric Diagnostics A**									**5**
77208	Optometric Eye Examination 1	V,Ü,L		4						5
77209	Optometric Eye Examination 2	V,Ü,L		2						
77013	**Communication Training in Optometry**									**5**
77301	Communication Training in Optometry	V,Ü			5					5
77014	**General Optics C**									**5**
77302	General Optics 5	V,Ü,L			6					5
77015	**Technological and Scientific fundamentals B**									**5**
77303	Eyeglass Lens Technology 1	V,Ü,L			3					5
77304	Eyeglass Lens Technology 2	V,Ü			1					
	Total SWS		**31**	**31**	**15**					
	Total CP		**30**	**30**	**15**					
	Total exams		**6**	**6**	**3**					

No	Module / Courses	Type	Study Semester SWS							CP
			1.	2.	3.	4.	5.	6.	7.	
77016	**Contact Lens Fitting A**						Internship Semester			**5**
77305	Contact Lens Fitting 1	V,L			3					5
77306	Contact Lens Fitting 2	V,L			3					
77017	**Optometric Diagnostics B**									**5**
77307	Optometric Eye Examination 3	V,Ü,L			4					5
77308	Binocular Vision 1	V,Ü,L			2					
77018	**Applied Optics and Laboratory**									**5**
77309	Applied Optics and Laboratory	V,Ü,L			6					5
77019	**Marketing and Consulting in Optometry**									**5**
77401	Marketing and Consulting Optometry	V,Ü, P				5				5
77020	**Wave Optics and Lab**									**5**
77402	Wave Optics and Lab	V,Ü,L				6				5
77021	**Contact Lens Fitting B**									**5**
77403	Contact Lens Fitting 3	V,L				6				5
77022	**Optometric Diagnostics C**									**5**
77404	Binocular Vision 2	V,L				6				5
77023	**Special Optometry**									**5**
77405	Introduction to Eye Diseases	V				2				5
77406	Low-Vision	V,Ü,L				2				
77024	**Technological and Scientific Fundamentals C**									**5**
77407	Eyeglass Lens Technology 3	V,Ü,L				3				5
77408	Study Design and Literature Review	V,Ü, P				1				
	Total SWS		**31**	**31**	**33**	**31**				
	Total CP		**30**	**30**	**30**	**30**				
	Total exams		**6**	**6**	**6**	**6**				

No	Module / Courses	Type	Study Semester SWS							CP
			1.	2.	3.	4.	5.	6.	7.	
77500	**Practical Semester in ophthalmic Optics / Optometry**									**30**
77501	Preparatory Seminar for practical Study Semester in AO	V					1			
77502	Practical Study Semester AO	P					X			30
77503	Colloquium Practical Study Semester AO	P								
77036	**Fundamentals of Medicine and Clinical Practice ****									**5**
77409	Eye Diseases	V						3		
77410	Supplements Eye Diseases and Contact Lenses	V, L						3		5
In the 6th semester of the Optometry degree program, 5 elective modules, each worth 5 CP, totaling 30 credit points, must be selected from the elective area. With the approval of the examination board, modules with equivalent CP credits from another bachelor´s degree program at Aalen University may also be selected.										
77901	**Elective subject AO-6.1**							X		**5**
77902	**Elective subject AO-6.2**							X		**5**
77903	**Elective subject AO-6.3**							X		**5**
77904	**Elective subject AO-6.4**							X		**5**
77905	**Elective subject AO-6.5**							X		**5**
77026	**Vocational / Work Education and Safety Technology in Optometry**									**5**
77709	Vocational / Work Education in Optometry	V,Ü							4	4
77710	Safety Technology / Entrepreneurship in Optometry	V							1	1
77028	**Contact Lens Fitting C**									**5**
77707	Contact Lens Fitting 4	V,L							6	5
77040	**Applied Optometry**									**5**
77708	Applied Optometry	V,Ü,L							4	5
	Total SWS		**31**	**31**	**33**	**31**		**WP ***	**15**	
	Total CP		**30**	**30**	**30**	**30**		**30 WP ***	**15**	
	Total exams		**6**	**6**	**6**	**6**		**6**	**4**	

Internship Semester

*WP=elective, BA=bachelor thesis, SG=general studies
**If students choose the international semester, they must complete the compulsory module 77036 „Fundamentals of Medicine and Clinical Practice“ in a comparable form at the foreign partner university.

No	**Module / Courses**	Type	Study Semester SWS							CP
			1.	2.	3.	4.	5.	6.	7.	
99999	**Bachelor thesis**									**12**
9999	Bachelor thesis	P							x	12
77999	**General Studies**									**3**
77999	General Studies	P							x	3
	Total SWS		**31**	**31**	**33**	**31**		**6 + WP ***	**15**	
	Total CP		**30**	**30**	**30**	**30**	**30**	**30 WP ***	**30 (15 + 12 BA + 3 SG)**	**210**
	Total exams		**6**	**6**	**6**	**6**		**6**	**4 + BA + SG**	**34 + BA + SG**

*WP=elective moduls, BA=bachelor thesis, SG=general studies

International Optometry (6th semester)

No	**Module / Courses**	Type	Study Semester SWS	CP
			6.	
77850	**International Optometry**			**30**
77651	Preparation for study semester abroad	V, Ü	1	30
77652	Studying abroad	X	X	
77653	Colloquium on International Optometry	P, S	1	

Elective area of study: Optometry

Modules from the elective area are shown as examples in the table below. In good time before the start of each semester, the examination board will publish a list of the modules („elective subjects“) offered in the elective area in an appropriate manner.

After approval by the examination board, it is possible to choose CP-equivalent modules from another bachelor´s degree program offered by Aalen University.

The courses from the elective modules must be selected in semester 6. A total of 25 credit points worth of elective modules must be selected in the Optometry program.

No	**Module / Courses**	Type	Study Semester SWS	CP
			6.	
77801	**Project Management**			**5**
77610	Project Management		4	5
77803	**App Development**			**5**
77613	App Development	V,Ü	4	5
77804	**Matlab/Python**			**5**
77614	Matlab/Python	V,Ü	4	5
77807	**Technical Optics**			**5**
77617	Image Technology	V	2	5
77618	Technical Optics Laboratory	L	4	
77810	**Optometry Project**			**5**
77621	Optometry Project	V,P	4	5
77811	**Context Training A**			**5**
77622	Law+Ethics	V	1	5
77623	Writing practice	V,Ü	2	

No	Module / Courses	Type	Study Semester SWS	CP
			6.	
77812	**Context training B**			**5**
77624	Englisch for Optometrists	V	2	5
77625	Argumentation und Rhetoric	V,Ü	1	
77813	**Subject supplements**			**5**
77626	Ray tracing and aberrations	V,Ü,L	2	5
77627	Optometry Project Supplement	V,Ü,L	1	

Module number: 77001 SPO version: 34

General Optics A

Course	Optometry
Module coordinator	Prof. Dr. Jürgen Nolting
Module type	Compulsory module
Semester	1st semester
Module duration	1 semester
Number of courses	2
Frequency	Winter
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Participation requirements e module	
Use in other S G	
Language	German

Module objectives **Technical skills**

Students can explain the basic optical effects of refraction and reflection within the framework of the paraxial approximation of geometric optics. They can describe the effect of simple optical elements (spherical mirrors, thin and thick lenses, lens systems consisting of two lenses). They can interpret the effect of apertures in the beam path and the significance of the pupil and aperture planes of optical systems. They can describe the structure of simple optical instruments (magnifying glass, microscope, telescope).

Students reproduce and adjust simple optical setups on the optical bench. They can perform simple optical measurements on these setups and interpret the measurement results.

Interdisciplinary skills
Through the practical course, students are able to work in groups of two and coordinate tasks, divide up work, and write a joint report
. In the self-study portion of the course, they develop the ability to
self-regulated learning. They can identify ways of obtaining information, e.g., through literature research.

Learning content Physical fundamentals of general optics
Reflection, flat mirrors, angular mirrors
Refraction, flat interface, plane-parallel plate, prism, wedge
Refracting spherical surface, constructions
Thick lenses, designs
Lens systems, designs
Spherical mirrors, constructions
Equivalent mirrors, designs;
Outlook for optical instruments
Magnification
Magnifying glass, microscope, telescope, camera
Apertures and aperture images
Aperture diaphragm, entrance and exit pupils
Field stop, entrance and exit aperture
Vignetting

Literature Recommendation:
Pedrotti: Optics for Engineers - Fundamentals, Springer Verlag
Roth: General Optics, DOZ-Verlag
Nolting: Beam Limitation, DOZ-Verlag

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77101	General Optics 1	Prof. Dr. Nolting, Staff	V,Ü,L	3	3
77102	General Optics 2	Prof. Dr. Nolting, Staff member	V,Ü,L	3	2

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77101, 77102	PLK (90 minutes)	100	

Requirements for admission to the module examination
The laboratory internship to be completed as part of modules 77101 and 77102 must have been successfully completed.

Further feedback during the course of study
Discussion of the internship reports

Comments: ---

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam (e-exam)
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Last update: January 13, 2023, Prof. Dr. Jürgen Nolting

Module number: 77002 SPO version: 34

Fundamentals of Natural Sciences A

Course	Optometry
Module coordinator	Prof. Dr. med. Thomas Kirschkamp
Module type	Compulsory module
Semester	1st semester
Module duration	1 semester
Number of courses	2
Frequency	Winter
Credits	5
Workload Attendance	60 hours
Workload Self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students are able to understand the fundamentals of physiological optics and ophthalmic technologies. They can describe and explain the visual system and its most important functions.
They can explain the structure of the visual system and thus understand the psychological stress experienced by customers who suffer from a defect in the visual system. Students can name psychophysical assessment criteria and examination procedures for the visual system.
In addition, they can explain basic chemical processes and can recognize, name, and describe them.

Interdisciplinary skills

Through exercises, students are able to apply their specialist knowledge. They are thus able to discuss the content both within the specialist community and with customers.

Learning content

Physiological Optics 1
Eye models according to Gullstrand
Eye model according to Listing
Purkinje mirror images
Optical pachometry

Chemistry, Biochemistry
Structure of matter: methods and models, structure of the atom, electrostatic forces, elements, periodic table, chemical bonds, molecules, ions, metals and alloys, three-dimensional structure of molecules, metals and salts and their representation (formulas), organic molecules, functional groups, nomenclature, isomerism.
Material systems and chemical reactions: interactions between molecules, properties of matter in different states of aggregation, amounts of substance (moles), solutions, hydrophilic and lipophilic substances, soaps and surfactants, concentration, osmotic pressure, reaction equations, material balance in reactions, acid-base reactions, redox reactions, polymerization, plastics.
Molecules and reactions in the organism (Biochemistry): Amino acids, peptides, proteins, fats (triglycerides), phospholipids, mono-, di- and polysaccharides, proteoglycans, vitamins, energy production, metabolic reactions in the eye (glycolysis, lactic acid fermentation, gluconeogenesis, glycogen metabolism), fatty acid degradation.

Literature

Physiological Optics 1

Basic literature:
- Deetjen, Speckmann: Physiology

Further reading:
- Bennet, Rabbetts: Clinical Visual Optics
- Straub, Kroll, Küchle: Ophthalmological Examination Methods
- Goldstein: Perceptual Psychology
- Lang: Ophthalmology
- Grehn: Ophthalmology
- Schmidt, Schaible: Neurophysiology and Sensory Physiology
- Hart (editor): Adler's Physiology of the Eye
- Kandel, Schwartz, Jessell (eds.): Neuroscience
- Kaufmann (ed.): Strabismus

Chemistry Fundamentals
- Specified by the respective lecturer

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77103	Physiological Optics 1	Prof. Dr. med. Thomas Kirschkamp	V,Ü	2	2
77104	Chemistry, Biochemistry	NN	V,Ü	2	3

[1] *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

Module examination (prerequisite for the award of credit points)

Course no.	Type and duration of performance assessment[1]	Determination of module grade	Comments
77103, 77104	PLK (90 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: December 3, 2022, Prof. Dr. med. Thomas Kirschkamp

1 *PLK Written exams* *PLR Presentation* *PLL Laboratory work* *PLT Learning diary*
PLS Term paper/research report *PLE Draft* *PLF Portfolio* *PMC Multiple choice*
PLM Oral examination *PLP Project* *PPR Internship* *PLC Multimedia-based exam (e-exam)*
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77003 SPO version: 34

Fundamentals of Optometry

Course	Optometry / Optometry
Module coordinator	Prof. Dr. Ulrike Paffrath
Module type	Compulsory module
Semester	1st semester
Module duration	1 semester
Number of courses	1
Frequency	Winter
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students are able to examine and describe different materials used in eyeglass lenses and frames. Students are also able to name eyeglass lens materials. Students also learn to describe mathematical techniques.

Interdisciplinary skills
Through exercises and laboratory practicals, students will be able to apply their technical knowledge. Students will be able to further develop their teamwork skills through group work in laboratories and tutorials.

Learning content

Fundamentals of ophthalmic supply laboratories:
Handling lens and frame materials

Fundamentals of frame and lens materials in ophthalmic optics:
Materials for eyeglass frames
Materials for eyeglass lenses and coatings

Fundamentals of mathematical methods:
Fundamentals of mathematics related to optometry: e.g., functions, error calculation, complex numbers, differential and integral calculus for optometric topics

Literature

Bohn: Technology for Opticians
Look and Bliedtner: Fundamentals of Optics and Technologies for Opticians
Mathematics:
Fetzer and Fränkel, Mathematics 1, Springer;
Papula, Volume 1, Mathematics for Engineers, Vieweg and Teubner;

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77105	Fundamentals of Optometry	Prof. Dr. Paffrath	V,Ü,L	6	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77105	PLF	Short written test during the semester 70% Presentation and report 30%	

Requirements for admission to the module examination
Successful participation in laboratory practicals

Further feedback during the course

Comments:

Last update: January 16, 2023, Prof. Dr. Ulrike Paffrath

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77004 SPO version: 34

Applied Computer Science

Degree program	Optometry
Module coordinator	Prof. Dr. Jürgen Nolting
Module type	Compulsory module
Semester	1st semester
Module duration	1 semester
Number of courses	1
Frequency	Winter
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	Audiology and hearing acoustics
Speech	German

Module objectives **Technical skills**

Students can apply the basic elements of procedural programming (data types, linear programs, conditional statements, loops, subroutine techniques, local and global data spaces) and can create Windows Forms applications in Visual Basic using standard objects. Students can describe the basics of algorithmic problem solving in Visual Basic and Excel. To solve algorithmic problems, students can use problem-specific applications programmed in Visual Basic or, alternatively, spreadsheet programs. They can explain and compare both methods. They can also create graphics in Excel. Students can compare the two approaches to solving problems in the field of optometry or audiology in order to select and implement the more efficient one.

Interdisciplinary skills
By forming learning groups with alternating leaders, students can moderate and resolve team conflicts. Exercises related to the lectures promote motivation and self-management. By applying the programming skills they have learned to problems of their own choosing, they can be
be highly creative. Students can apply goal-oriented, problem-oriented working methods when programming on the computer. They can identify and apply various options for obtaining information.

Learning content
Fundamentals of procedural and object-oriented programming
Introduction to Visual Basic
Event-driven program flow
Loops
Local and global data spaces
Subroutines
Spreadsheets and charts with Excel

Literature
Theis: Introduction to Visual Basic 2017, Rheinwerk Publishing

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77106	Applied Computer Science	Nolting	V,Ü,L	6	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77106	PLM (15 minutes) graded	100	

Requirements for admission to the module examination
The programming exercises to be completed as part of module 77106 must have been successfully passed.

Further feedback during the course --

Comments: --

Last update: April 5, 2023, Prof. Dr. J. Nolting

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77005 SPO version: 34

Technological and Scientific Fundamentals A

Course	Optometry
Module coordinator	Prof. Dr. Jürgen Nolting
Module type	Compulsory module
Semester	1st semester
Module duration	1 semester
Number of courses	2
Frequency	Winter
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives

Technical skills

Students can perform various lighting measurements in the laboratory and evaluate the measurement results. They can describe the various photometric quantities. They can describe the various light sources and their basic physical principles. They can distinguish between and describe the various types of glare. Students will be able to perform a simple workplace analysis, justify it, and suggest initial improvement measures. They will also be able to identify the influence of daylight on humans.

Interdisciplinary skills

Through the internship, students are able to work in pairs and coordinate tasks, divide up work, and write a joint report
. In the self-study portion of the course, they develop the ability to
self-regulated learning. They can identify ways of obtaining information, e.g., through literature research.

Learning content

Photometry units and quantities
Influence of light on the visual apparatus, psyche, and biological processes
Quantities and units in surface optics
History, technology, and physics of light generation
Criteria for good lighting and implementation in everyday life
Workplace analysis
Practical application:
Various light measurement exercises
Simple workplace analysis

Literature

Recommendation:
Schröder: Technical Optics, Vogel Publishing
Nolting/Dittmar: Optical Measurement Technology – Radiometry, Photometry, and Color Measurement, DOZ-Verlag
Sutter: Protection Against Optical Radiation, VDE-Verlag

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77107	Workplace Optometry and Photometry 1	Prof. Dr. Jürgen Nolting, Staff member	V,Ü,L	2	3
77108	Occupational Optometry and Photometry 2	Prof. Dr. Jürgen Nolting, Staff member	V,Ü,L	2	2

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comments
77107, 77108	PLK (60 minutes)	100	

Requirements for admission to the module examination
The laboratory internship to be completed as part of modules 77107 and 77108 must have been successfully completed.

Further feedback during the course of study
Discussion of the internship reports

Comments: --

Last update: December 7, 2022, Prof. Dr. Jürgen Nolting

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number : 77006 SPO version : 34

Digital Business Models Start-up Management Optometry Optometry

Degree program	B.Sc. Optometry/Optometry
Module name	Digital Business Models/Start-up Management Optometry/Optometry
Module coordinator	Prof. Dr. Anna Nagl
Module type	Compulsory module
Semester	1st semester
Module duration	1 semester
Number of courses	1
Frequency	Winter
Credits	5
Workload Attendance	75
Workload for self-study	75
Participation requirements Requirements Module	
Use in other other degree programs	
Language	German

Module objectives

Technical skills
Students will be able to assess important digital trends and approaches for business model innovations and their impact on optometry/optometry and develop a digital business model or business plan.
Students are able to evaluate the commercial and legal requirements for the competitiveness of a company and professional development potential in an optometry business. Furthermore, students are able to prepare, carry out, and evaluate tasks related to the establishment and takeover of an optometry business, taking into account personal, legal, and business conditions and objectives, and to justify their significance for a business concept. Students are able to manage a company, identify operational growth potential, and develop corporate strategies, taking into account company-related strengths and weaknesses as well as market-related opportunities and risks, particularly against the backdrop of digitalization and the rapid development of artificial intelligence.

Interdisciplinary skills
Students are able to apply their skills to specific tasks both independently and in a team. In addition, they are able to prepare presentations and discuss and defend them in a so-called pitch.

Learning content

- Management and business leadership skills for entrepreneurs (e.g., team building, communication and leadership skills, project and quality management, and business law for entrepreneurs)
- Guidelines for creating a business model
- Guidelines for creating a business plan

Literature

- Current scripts available on the LMS (Learning Management System) Canvas
- Nagl, A. 2020: The Business Plan: Creating Professional Business Plans. With checklists and case studies. 10th edition, Springer Gabler Verlag
- Bozem, K./Nagl, A. 2021: Successfully implementing digital business models: Business model building with checklists and case studies. 2nd edition, Springer Gabler Verlag
- Further current literature on business models and business plans.

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77109	Digital Business Models/Start-up Management Optometry/Optometry	Prof. Dr. Anna Nagl/ Lecturer	V, Ü, P	5	5

Module examination (prerequisite for the award of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77109	PLF	The portfolio consists of presentations (50%) and written assignments (50%).	

Requirements for admission to the module examination

Further feedback during the course

Comments:

Last update: December 21, 2022, Prof. Dr. Anna Nagl

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1 *V Lecture; L Laboratory; S Seminar; PR Internship; EX Experiment; X Not fixed; E Excursion; Ü Practical; P Project; K Colloquium; EL E-learning*
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams; PLR Presentation; PLL Laboratory work; PLT Learning diary; PLS Term paper/research report; PLE Draft; PLF Portfolio; PMC Multiple choice; PLM Oral examination; PLP Project; PPR Internship; PLC Multimedia-based Examination (e-exam); PLA Practical work*
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77007 SPO version: 34
Management Skills for Optometrists in English

Degree	B.Sc. Optometry
Module name	Management Skills for Optometrists in English
Module coordinator	Prof. Dr. Anna Nagl
Module type	Compulsory module
Semester	2nd semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	75
Workload for self-study	75
Participation requirements Requirements Module	
Use in other other degree programs	
Language	English

Module objectives

Technical skills
The student can demonstrate fundamental understanding, knowledge of competencies, and knowledge in areas of optometric practice. The students are able to develop strategic decisions and realize concepts in leadership, strategy, management, and marketing. They can demonstrate knowledge about basic business characteristics of an optometry practice, such as mission statements, calculations, and budget planning. They are able to overview complex relationships within a business itself and in connection with competitors.

Interdisciplinary skills
The students are able to transfer management skills in the field of optometry. The students are able to evaluate alternative strategic options for innovative optometry practices. The students have the ability to look after patients in a safe, appropriate, and confidential environment. They have the ability to communicate by adhering to appropriate ethical and cultural standards.
They have the ability to comply with legal, professional, and ethical issues.

Learning content

Among others:

- the legal obligations for optometric practice,
- ethical and cultural standards,
- a safe environment through quality assurance and risk management strategies,
- using strategies to promote health and prevent illnesses, and
- participating in continuing professional development activities to maintain competencies and knowledge in areas of optometric practice.

Literature Current scripts and recommended reading are available on the LMS (Learning Management System) of Aalen University in Canvas.

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77201	Management Skills for Optometrists in English	Prof. Dr. Anna Nagl/ Lecturer	V, Ü, P	5	5

Module examination (prerequisite for the awarding of credit points)

LV No.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77201	PMC 60 minutes		

Requirements for admission to the module examination

Further feedback during the course of study

Com**ments**:

Last update: December 21, 2022, Prof. Dr. Anna Nagl

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1 ***V*** *Lecture* ***L*** *Laboratory* ***S*** *Seminar* ***PR*** *Internship* ***EX*** *Experiment* ***X*** *Not fixed*
E *Excursion* ***Ü*** *Practical* ***P*** *Project* ***K*** *Colloquium* ***EL*** *E-learning*
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 ***PLK*** *Written exams* ***PLR*** *Presentation* ***PLL*** *Laboratory work* ***PLT*** *Learning diary*
PLS *Term paper/research report* ***PLE*** *Draft* ***PLF*** *Portfolio* ***PMC*** *Multiple choice*
PLM *Oral examination* ***PLP*** *Project* ***PPR*** *Internship* ***PLC*** *Multimedia-based Examination (e-exam)*
PLA *Practical work*
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77008 SPO version: 34

General Optics B

Study	Optometry
Module coordinator	Prof. Dr. Ulrike Paffrath
Module type	Compulsory module
Semester	2nd semester
Module duration	1 semester
Number of courses	2
Frequency	Summer
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students can describe how prismatic and toric lenses are calculated for an eye with a refractive error and can determine their main cuts. They can classify the most important imaging errors in spherical lenses. Students can describe diffraction and interference and can interpret and clarify questions relating to these phenomena.

Interdisciplinary skills
Through the internship, students can coordinate tasks in small groups, divide up the work, and write a joint report. They are able to reflect on their own actions.

Learning content

Prismatic elements and their combination;
decentration and prismatic effect, centering errors;
Toric elements, cylindrical lenses, astigmatic lenses
Principal sections, principal curvatures, and refractive indices; Euler's theorem
Combination of obliquely crossed toric elements
Circles of dispersion and depth of field;
Introduction, classification of imaging errors
Chromatic aberrations, achromaticity
Spherical aberration, influencing factors, best lens shape
Coma; astigmatism of oblique beams; image field curvature
Distortion;
Reflecting conic aspheres; refracting conic aspheres, applications;
wave theory, Huygens' principle; gradient optics
Superposition of waves, interference; coherence, visible interference
Application: optical coherence tomography (OCT)
Diffraction at rectangular slits, double slits, gratings, circles

Literature

Pedrotti et al. Optics for Engineers, Springer Verlag
Diepes, Optics and Technology of Eyeglasses

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77202	General Optics 3	Prof. Dr. Paffrath	V,Ü,L	3	3
77203	General Optics 4	Prof. Dr. Paffrath	V,Ü,L	3	2

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77202, 77203	PLF	Short written test during the semester 70% Presentation and report 30%	

Requirements for admission to the module examination

Further feedback during the course

Comments:

Last update: April 20, 2024, Prof. Dr. U. Paffrath

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77009 SPO version: 34

Fundamentals of Natural Sciences B

Degree program	Optometry
Module coordinator	Prof. Dr. med. Thomas Kirschkamp
Module type	Compulsory module
Semester	2nd semester
Module duration	1 semester
Number of courses	2
Frequency	Summer
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students are able to understand the fundamentals of physiological optics and ophthalmic technologies. They can describe and explain the visual system and its most important functions.
They can explain the structure of the visual system and thus understand the psychological stress experienced by customers who suffer from a defect in the visual system. Students can name psychophysical assessment criteria and examination procedures for the visual system.
With a basic knowledge of medical statistics, students are able to graphically represent and describe measurement data, select and confidently apply appropriate statistical analysis methods, and correctly interpret their results. They can create and classify diagnostic test indicators.

Interdisciplinary skills

Through exercises, students are able to apply their specialist knowledge. They are thus able to discuss the content both within the specialist community and with customers. They can write papers independently. Through teamwork, they can resolve conflicts, distribute tasks, and work on them together.

Learning content

Physiological Optics 2
Refraction anomalies
Geometric circle of confusion and depth of field according to the Listing model of the eye

Phenomena from sensory physiology
Visual acuity and contrast

Biostatistics
Introduction
Descriptive statistics: Graphical representations and empirical measures
Chance, probability, and distributions
Inferential statistics: confidence intervals and hypothesis testing (in particular parametric and nonparametric tests for one or two samples: t-test and Wilcoxon test)
Correlation and regression for pairs of values

Literature

Physiological Optics 2

Basic literature:
- Deetjen, Speckmann: Physiology

Further reading:
- Bennet, Rabbetts: Clinical Visual Optics
- Straub, Kroll, Küchle: Ophthalmological Examination Methods
- Goldstein: Perceptual Psychology
- Lang: Ophthalmology
- Grehn: Ophthalmology
- Schmidt, Schaible: Neurophysiology and Sensory Physiology
- Hart (editor): Adler's Physiology of the Eye
- Kandel, Schwartz, Jessell (eds.): Neuroscience
- Kaufmann (ed.): Strabismus

Fundamentals of Biostatistics
- specified by the respective lecturer

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77204	Physiological Optics 2	Prof. Dr. med. Thomas Kirschkamp	V	2	3
77205	Fundamentals of Biostatistics	Prof. Dr. Christina Schwarz	V,Ü	2	2

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comments
77204, 77205	PLK (90 minutes)	100	

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: December 8, 2025, Prof. Dr. C. Schwarz

Module number: 77010 SPO version: 34

Fundamentals of Natural Sciences C

Course	Optometry / Focus on Clinical Optometry
Module coordinator	Prof. Dr. med. Thomas Kirschkamp
Module type	Compulsory module
Semester	2nd semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students are able to understand the fundamentals of physiological optics and ophthalmic technologies. They can describe and explain the visual system and its most important functions.
They can explain the structure of the visual system and thus understand the psychological stress experienced by customers who suffer from a defect in the visual system. Students can name psychophysical assessment criteria and examination procedures for the visual system.

Interdisciplinary skills

Through exercises, students are able to apply their specialist knowledge. They are thus able to discuss the content both within the specialist community and with customers.

Learning content

Correction of spherical ametropia
Accommodation effort and success in the corrected spherically ametropic eye
Retinal image sizes in the corrected spherically ametropic eye

Perimetry
Colors and color vision
Color vision testing
Tonometry
Pachymetry
Fundamentals of vision

Literature

Basic literature:
- Dietze: The Optometric Examination
- Deetjen, Speckmann: Physiology

Further reading:
- Straub, Kroll, Küchle: Ophthalmological examination methods
- Lang: Ophthalmology
- Grehn: Ophthalmology

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77206	Physiological Optics 3	Prof. Dr. med. Thomas Kirschkamp	V	4	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77206	PLK (60 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: December 3, 2022, Prof. Dr. med. Thomas Kirschkamp

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77011 SPO version: 34

Optometry and dispensing laboratory

Course	Optometry / Ophthalmic Optics/Optometry
Module coordinator	Prof. Dr. Ulrike Paffrath
Module type	Compulsory module
Semester	2nd semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students can explain how eyeglass frames and lenses are used to meet customer needs. They can identify the most important centering errors in eyeglass lenses. Students can explain the basic methods used in the optical supply laboratory and can justify the issues involved.

Interdisciplinary skills
During the internship, students can coordinate tasks and divide up the work in small groups. They are able to reflect on their own actions.

Learning content

In-depth study of materials, eyeglass frames, and lenses with regard to the customer
In-depth study of designs/images of eyeglass lenses
Instruments and tools used in the optical supply laboratory
Supplying customers with frames and lenses
Focus areas: including fitting and centering

Literature

The Practice of Optical Eyeglass Fitting, Jörg Tischer, DOZ-Verlag
Eyeglass Fitting, Johannes Eber, Wolfgang Schulz; DOZ-Verlag
Diepes, Blendowske: Optics and Technology of Eyeglasses, DOZ-Verlag

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77207	Optometry and Supply Laboratory	Prof. Dr. Paffrath	V,Ü,L	6	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77207	PLF	Short written test during the semester 70% Presentation and report 30%	

Requirements for admission to the module examination
Successful participation in the laboratory practical

Further feedback during the course

Comments:

Last update: January 16, 2023, Prof. Dr. Ulrike Paffrath

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77012

SPO version: 34

Optometric Diagnostics A

Study	Optometry
Module coordinator	Prof. Dr. Judith Ungewiß
Module type	Compulsory module
Semester	2nd semester
Module duration	1 semester
Number of courses	2
Frequency	Summer
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students acquire sound knowledge of refractive errors and are able to describe and differentiate between them. They can explain the basics of objective refraction determination using skiascopy and can apply this knowledge in practice. They can name the basic measuring principles of manual and automatic refractometers and can explain the factors that influence automatic refraction determination.

Interdisciplinary skills

Through internships, they can resolve conflicts by working together in a team. They can independently create supplementary handouts and/or presentations on the lecture content (optional).

Learning content Introduction and definitions:

Objective refraction
Methods of retinoscopy (theory and practice)
Refractometry
Ophthalmometry

Subjective refraction
Refractive errors and visual acuity (theory and practice)
Determining the best sphere (theory and practice)
Methods for determining astigmatism (theory and practice)
Methods for binocular adjustment (theory and practice)

Testing methods for near vision
Determining the range of accommodation (theory and practice)
-Determining the near addition using different methods (theory and practice)
-Binocular adjustment at close range (theory and practice)

Medical history
-Legal basis, confidentiality, retention obligation
-The IO index card
-Main reason for the visit
-Visual, ocular, and other symptoms, personal history
-Eye health, general health, family history
-Complete initial examination (theory and practice)

Functional tests, general screening
-Cover/uncover (theory and practice)
-Near point of convergence (theory and practice)
-Eye motility, smooth eye movements, saccades (theory and practice)
-Pupil reflex test (theory and practice)
-Confrontation test (theory and practice)

Literature Basic literature:
- Diepes: Refraction determination
- Dietze: The optometric examination
- Lachenmayr, Friedburg, Buser: Eye - Glasses - Refraction

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77208	Optometric Eye Examination 1	Prof. Dr. Judith Ungewiß, Staff	V,Ü,L	4	3
77209	Optometric eye examination 2	Prof. Dr. Judith Ungewiß, Staff	V,Ü,L	2	2

[1] *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

Module examination (prerequisite for the awarding of credit points)

LV No.	Type and duration of performance assessment[1]	Determination of module grade	Comment
77208, 77209	PLK (60 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: May 12, 2024, Prof. Dr. Jürgen Nolting

1 *PLK Written exams* *PLR Presentation* *PLL Laboratory work* *PLT Learning diary*
PLS Term paper/research report *PLE Draft* *PLF Portfolio* *PMC Multiple choice*
PLM Oral examination *PLP Project* *PPR Internship* *PLC Multimedia-based exam (e-exam)*
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77013 SPO version: 34
Communication training in optometry and optometry

Degree program	B.Sc. Optometry/Optometry
Module name	Communication Training in Optometry/Optometry
Module coordinator	Prof. Dr. Anna Nagl
Module type	Compulsory module
Semester	3rd semester
Module duration	1 semester
Number of courses	1
Frequency	Winter
Credits	5
Workload Attendance	75
Workload for self-study	75
Participation requirements Prerequisite Module	
Use in other other degree programs	
Language	German

Module objectives

Technical skills
Students are able to reflect on their own communication behavior. They are able to communicate effectively in teams and learn to apply and reflect on important measures to ensure successful communication. Students are able to apply the basics of conversation and conflict management as well as time management. Furthermore, students will be able to explain visual impairments and interpret prescriptions from ophthalmologists. They will be able to transfer the prescriptions to lens and frame consultation and fitting, thereby deriving appropriate and individual solutions for opticians'/optometrists' customers.

Interdisciplinary skills
With additional support from coaching in the 7th semester in consultation and sales talks, students are able to apply the communication skills required in daily practice when advising customers and colleagues in optometry businesses with "real" customers.

Learning content

In addition to sales training for eyeglasses and optometric services (which is offered through a coaching concept in small teams by the so-called "trainers" of the 7th semester (see course on vocational and work pedagogy) for the "trainees" of the 3rd semester on the following topics:
- Greeting
- Needs assessment (key point: medical history)
- Feature-benefit argumentation
- Offer, presentation, and pricing
- Handling objections
- Closing the sale
- Farewell – "The lasting impression"
- After the purchase
- Complaints

This module covers
- Presentation techniques and visualization
- Moderation
- time management and
- conversation techniques and conflict management
.

Literature

- Current scripts available on the LMS (Learning Management System) Canvas

- Klaus, L. (2022): Guide to "Consulting and Sales Techniques" in Optometry https://coe-campus.de/weiterbildung/beratungs-und-verkaufstechniken-hochschule-aalen [accessed on 12/21/2022]

- Nagl, A./Wollherr, T. (2008): Selling and Consulting in Optometry. The Guide for Opticians. ZVA-inform Brochure No. 22. DOZ-Verlag series. Heidelberg.

- Morgret, K. (2010): Eyes open when advising on glasses: A workbook for promoting learning autonomy in the module "Marketing and Sales in Optometry and Audiology" at Aalen University. Bachelor's thesis.

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77301	Communication Training in Optometry/Optometry	Prof. Dr. Anna Nagl/ Lecturer	V, Ü	5	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
7730	PLM 30 minutes	100	

1 *V Lecture; L Laboratory; S Seminar; PR Internship; EX Experiment; X Not fixed; E Excursion; Ü Practical; P Project; K Colloquium; EL E-learning*
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams; PLR Presentation; PLL Laboratory work; PLT Learning diary; PLS Term paper/research report; PLE Draft; PLF Portfolio; PMC Multiple choice; PLM Oral examination; PLP Project; PPR Internship; PLC Multimedia-based Examination (e-exam); PLA Practical work*
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: December 21, 2022, Prof. Dr. Anna Nagl

Module number: 77014 SPO version: 34

General Optics C

Study	Optometry
Module coordinator	Prof. Dr. Jürgen Nolting
Module type	Compulsory module
Semester	3rd semester
Module duration	1 semester
Number of courses	1
Frequency	Winter
Credits	5
Workload Attendance	60 hours
Workload Self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students can describe basic concepts and relationships in the field of technical optics. Students can independently analyze problems and calculate solutions in the subject area covered.

Students describe the relationships in the field of "Optical instruments for visual use." Students can explain and justify the structure and functioning of the optical instruments presented. They can analyze and explain the optical properties of optical instruments. They can apply elements of physical and geometric optics and construct an optical instrument. They can evaluate and justify when an optical instrument is used appropriately.

Interdisciplinary skills
Through the laboratory exercises, students are able to work in pairs and coordinate tasks, divide up work, and write a joint report. The proportion of self-study enables them to engage in self-regulated learning. They can obtain information, e.g., through literature research.

Learning content

Beam limitation
Illumination systems (condensors, interlaced beam path)
Magnification
Magnifying glasses and eyepieces
Microscopes, Köhler illumination, contrast methods
Projectors, telescopes, and telescopes
Electronic image capture and reproduction
Basic principles of image processing
Photographic optics, lenses, depth of field
Other topics: Image stabilization, autofocus, stereoscopy
Technical optics in optometry: ophthalmometers, autorefractometers, OCT
Night vision and infrared devices
Quantum optical light generation: lasers and nonlinear optical effects

Literature Recommendation:
Schröder: Technical Optics, Vogel Publishing
Radloff: Lasers in Science and Technology, Spektrum-Verlag
Bergmann-Schäfer: Textbook of Experimental Physics, Vol. 3 – Optics, de Gruyter

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77302	General Optics 5	Prof. Dr. Nolting Employee	V,Ü,L	6	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
7730	PLK (90 minutes)	100	

Prerequisites for admission to the module examination
The laboratory internship to be completed as part of module 77302 must have been successfully completed.

Further feedback during the course
Discussion of the internship reports

Comments: --

Last update: September 30, 2024, Prof. Dr. Jürgen Nolting

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77015 SPO version: 34

Technological and Scientific Fundamentals B

Course	Optometry
Module coordinator	Prof. Dr. Christina Schwarz
Module type	Compulsory module
Semester	3rd semester
Module duration	1 semester
Number of courses	2
Frequency	Winter
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students are able to calculate spherical lenses for a vision-impaired eye and determine their geometry. They can calculate the most important imaging errors in spherical lenses. Students can explain the geometric-optical fundamentals of imaging errors in single vision lenses and can interpret and discuss related issues.

Interdisciplinary skills
Through exercises, students are able to solve tasks together as a team and discuss technical issues. This promotes their independence and personal responsibility.

Learning content The optics of the eye

Basic optical, geometric, and technical properties of spherical and aspherical single vision lenses, multifocal lenses, and conventional progressive lenses, as well as the special features of cylindrical and prismatic lenses. Conventional and modern manufacturing methods are also covered.

Measurement and practical value
Multifocal lenses
Progressive lenses
Clear vision zones
Indoor lenses
Centering devices/lens centering

Literature Diepes, Blendowske: Optics and Technology of Eyeglasses, DOZ-Verlag

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77303	Eyeglass Lens Technology 1	Prof. Dr. Christina Schwarz	V,Ü,L	3	3
77304	Lens technology 2	Prof. Dr. Christina Schwarz	V,Ü	1	2

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77303, 77304	PLK (60 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: December 8, 2025, Prof. Dr. C. Schwarz

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77016 SPO version: 34

Contact lens fitting A

Course	Optometry
Module coordinator	Prof. Dr. med. Andreas Holschbach
Module type	Compulsory module
Semester	3rd semester
Module duration	1 semester
Number of courses	2
Frequency	Winter
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students can explain the anatomical and physiological principles of contact lens fitting. They can describe common technical terms and name contact lens materials and their properties. They are able to apply this knowledge in the systematic procedure for fitting rotationally symmetrical, dimensionally stable, and soft contact lenses.

Students will be able to classify all relevant technical parameters and their determination and will be able to use this knowledge to perform targeted and optimized contact lens fittings.

Interdisciplinary skills

Through mutual practice during the internship, students can solve tasks together and resolve conflicts. They can fit contact lenses in real-life settings for people outside the program, thereby developing their communication, consulting, and instruction skills for dealing with future customers. They can give presentations.

Learning content Theory:

Contact lens fitting 1:
- Structure of the slit lamp microscope and types of illumination
- Examination using a slit lamp microscope
- Measurement of proportions of the eye
- Determination and analysis of the surface shape of the cornea (topometry)
- Definitions and classifications of contact lenses
- Contact lens fitting procedure (overview)

Contact lens fitting 2:
Quality control and normative tolerances of dimensionally stable contact lenses
Selection, assessment, individual fitting, and targeted modification of the fit of rigid contact lenses with different back surface geometries

Practical training:
Contact lens fitting 1:
- Adjustment of different types of illumination on the slit lamp microscope
- Procedure for examination using a slit lamp microscope
- Measurement of proportions on the eye and vital staining
- Corneal topometry using various common methods

Contact lens fitting 2:
Quality control of dimensionally stable contact lenses
Selection, handling, assessment, individual fitting, and targeted modification of the fit of dimensionally stable contact lenses with different back surface geometries

Literature will be announced in the first lecture.

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77305	Contact lens fitting 1	Prof. Dr. med. Andreas Holschbach, Staff	V,L	3	3
77306	Contact lens fitting 2	Prof. Dr. med. Andreas Holschbach, Staff	V,L	3	2

[1] *V Lecture* *L Laboratory* *S Seminar* *PR Internship* *EX Experiment* *X Not fixed*
E Excursion *Ü Practical* *P Project* *K Colloquium* *EL E-learning*

Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[1]	Determination of module grade	Comment
77305, 77306	PLK (60 minutes)	100	

Requirements for admission to the module examination
Participation in the practical course or submission of the laboratory report

Further feedback during the course of study

Comments: ---

Last update: December 14, 2022, Prof. Dr. Holschbach

[1] *PLK Written exams; PLR Presentation; PLL Laboratory work; PLT Learning diary; PLS Term paper/research report; PLE Draft; PLF work; PMC Multiple choice; PLM Oral examination; PLP Project; PPR Portfolio; PLC Multimedia-based exam (e-exam); PLA Practical work; Internship*
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77017 SPO version: 34

Optometric Diagnostics B

Study	Optometry
Module coordinator	Prof. Dr. J. Ungewiß
Module type	Compulsory module
Semester	3rd semester
Module duration	1 semester
Number of courses	2
Frequency	Winter
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation in module	
Use in other SG	
Language	German

Module objectives

Technical skills

Students are able to assess and measure visual impairments. They can explain and apply the basics of various methods for determining refraction. They can systematically apply methods and develop a feel for the concerns and reactions of test subjects during the refraction determination process.

Interdisciplinary skills

They are able to act in a goal-oriented and customer-friendly manner when determining refractive status. They have an empathetic understanding of the test subjects and a fostered ethical behavior.
Through the internship and the mutual practice it involves, students can work together in a team, complete tasks, and resolve conflicts.

Learning content

Subjective refraction
Refractive errors and visual acuity (theory and practice)
Determining the best sphere (theory and practice)
Methods for determining astigmatism (theory and practice) Methods for binocular adjustment (theory and practice)

Testing methods for proximity
- Determination of accommodation range (theory and practice)
- Determining the near addition using different methods (theory and practice)

Prescription
Factors that must be taken into account
Myopia, hyperopia, astigmatism

Refraction under cycloplegia
Objective and subjective refraction under cycloplegia (theory)

Introduction to binocular vision
Summation, development, disorders

Literature

Optometric eye examination 3

Basic literature:
- Dietze: The Optometric Examination

Further reading:
- Straub, Kroll, Küchle: Ophthalmological Examination Methods

Basic literature:
- Diepes: Refraction Determination
- Dietze: The Optometric Examination
- Lachenmayr, Friedburg, Buser: Eye - Glasses - Refraction

Further reading:
- Kaufmann (ed.): Strabismus

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77307	Optometric Eye Examination 3	Prof. Dr. Judith Ungewiß, staff	V,Ü,L	4	4
77308	Binocular vision 1	Prof. Dr. Judith Ungewiß, staff	V,Ü,L	2	1

Module examination (prerequisite for the awarding of credit points)

LV No.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77307 77308	PLK (90 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study Comments:

Last update: September 30, 2024, Prof. Dr. Judith Ungewiß

[1] *V Lecture, L Laboratory, S Seminar, PR Internship, EX Experiment, X Not fixed, E Excursion, Ü Practical, P Project, K Colloquium, EL E-learning*
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

[2] *PLK Written exams, PLR Presentation, PLL Laboratory work, PLT Learning diary, PLS Term paper/research report, PLE Draft, PLF Portfolio, PMC Multiple choice, PLM Oral examination, PLP Project, PPR Internship, PLC Multimedia-based exam (e-exam), PLA Practical work*
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77018 SPO version: 34

Applied Optics and Laboratory

Course	Optometry / Opticianry/Optometry
Module coordinator	Prof. Dr. Ulrike Paffrath
Module type	Compulsory module
Semester	3rd semester
Module duration	1 semester
Number of courses	1
Frequency of service	Winter semester
Credits	5 CP
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students are able to examine the properties of eyeglass frames and lenses from different perspectives and draw conclusions about their practical properties for the future wearer. This enables them to provide customers with optimal and targeted advice and find solutions. They can determine when which lenses should be used. They can explain and apply the properties of eyeglass lenses.

Interdisciplinary skills
In the laboratory, students can coordinate tasks and divide up the work in small groups. They are able to reflect on their own actions.

Learning content

Optical supply laboratory
Centering devices
Eyeglass lenses and immobile eyes
Measurements on spectacle lenses
Lenses and the viewing eye
Centering error, prism
Intrinsic magnification, system magnification
Accommodation requirement and success,
imaging errors and corrections (Tscherning),
Astigmatism and refractive errors,
myopia progression, visual training

Literature The Practice of Optical Eyeglass Fitting, Jörg Tischer, DOZ-Verlag
Eyeglass Fitting, Johannes Eber, Wolfgang Schulz; DOZ-Verlag
Diepes, Blendowske: Optics and Technology of Eyeglasses, DOZ-Verlag

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77309	Applied Optics and Laboratory	Prof. Dr. U. Paffrath	V,Ü,L	6	5

Module examination (prerequisite for the award of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77309	PLF	Short written test during the semester 70% Presentation and report 30%	

Requirements for admission to the module examination
Successful participation in the laboratory/practical training

Further feedback during the course

Comments:

Last update: April 20, 2024, Prof. Dr. Ulrike Paffrath

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning journal*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77019 SPO version: 34
Marketing and Consulting Optometry Optometry

Degree program	B.Sc. Optometry/Optometry
Module name	Marketing and Consulting in Optometry/Optometry
Module coordinator	Prof. Dr. Anna Nagl
Module type	Compulsory module
Semester	4th semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	75
Workload for self-study	75
Participation requirements Prerequisite Module	
Use in other other degree programs	
Language	German

Module objectives

Technical skills
Students are able to apply the marketing and consulting skills acquired in lectures in a goal-oriented manner during the practical semester. They can develop and evaluate marketing concepts and take into account the legal aspects of marketing and advertising. Furthermore, students are able to develop and implement marketing concepts for optometric services.

Interdisciplinary skills
Students will be able to develop personas, assess customers, interpret signals that customers consciously or unconsciously send to their optician/optometrist, and evaluate the needs and wishes of customers. Students can analyze individual, customer-specific vision requirements in the field of progressive lenses and use this information to provide optimal lens and frame advice as well as anatomical and optical eyeglass fitting.

Learning content

- Methods and techniques of strategic and operational marketing management
- Practical application of marketing mix instruments
- Omnichannel marketing and marketing trends
- Customer relationship management and total loyalty marketing
- Product management: tasks/skills/responsibilities in theory and practice
- Provision of optometric services
- Empirical research and statistical evaluations
- Legal aspects of marketing and advertising
- Fundamentals of consulting and sales in optometry and audiology
    - Communication
    - Sales psychology
    - Process/phases of sales and consulting discussions
    - Handling objections and complaints
- Practicing consulting and sales discussions using examples from the daily practice of an optician/optometrist
    - Greeting and needs assessment
    - Feature-benefit argumentation and product presentation: frame, lens and contact lens consultation, as well as optical eyeglass fitting and
    - Pricing, closing the sale, and follow-up sales
    - Farewell, after-sales

Literature

- Current scripts available on the LMS (Learning Management System) Canvas

- Grunwald, G./Hempelmann, B. (2012): Applied Market Research: A Practice-Oriented Introduction. De Gruyter Verlag. Berlin.

- Nagl, A. (2017): The Marketing Plan. The 10 Commandments of Successful Marketing. 2nd edition, C.H. Beck Verlag. Munich.

- Nagl, A. (2004): Service Marketing in Optometry: A Practical Guide. ZVA-inform brochure no. 16. Series of publications from the DOZ-Verlag. Heidelberg.

Verlag. Heidelberg.

- Online editions of brandeins and

- Further current literature recommendations.

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77401	Marketing and Consulting in Optometry/Optometry	Prof. Dr. Anna Nagl/ Lecturer	V, Ü, P	5	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
7740	PLF 30 minutes	The portfolio consists of a simulated consultation and sales conversation (40%) and written work (60%).	

1 *V Lecture, L Laboratory, S Seminar, PR Internship, EX Experiment, X Not fixed; E Excursion, Ü Practical, P Project, K Colloquium, EL E-learning*
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams, PLR Presentation, PLL Laboratory work, PLT Learning diary; PLS Term paper/research report, PLE Draft, PLF Portfolio, PMC Multiple choice; PLM Oral examination, PLP Project, PPR Internship, PLC Multimedia-based Examination (e-exam); PLA Practical work*
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Requirements for admission to the module examination

Further feedback during the course

Comments:

Last update: December 21, 2022, Prof. Dr. Anna Nagl

Module number: 77020 SPO version: 34

Wave Optics and Lab

Study	Optometry / Optometry
Module coordinator	Prof. Dr. Christina Schwarz
Module type	Compulsory module
Semester	4th semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives

Technical skills

Students discuss their knowledge of wave physics phenomena with regard to ophthalmic optics. Students can determine and identify wave optical characteristics of light. They can distinguish between topics related to diffraction and interference in ophthalmic optics.

By attending lectures in English, students expand their knowledge of this scientific language and are able to debate in English.

Interdisciplinary skills

Through the internship, students are able to organize themselves in small groups, coordinate tasks, and divide up the work. Through experiments, students are able to operate laboratory equipment and can discuss their solutions and interact with others.

Learning content

Diffraction and resolution limit (e.g., resolution limit of the eye)
Interference and thin films (e.g., thin films on spectacle lenses)
Polarization

Literature

Pedrotti, F.: Optics for Engineers, Springer Verlag
Hecht, E.: Optics, Oldenbourg Verlag

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77402	Wave Optics and Lab	Prof. Dr. Christina Schwarz	V,Ü,L	6	5

Module examination (prerequisite for the award of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77402	PLF	Short written test during the semester 70% Presentation and report 30%	

Requirements for admission to the module examination
All laboratory experiments must be successfully completed with a report.

Further feedback during the course

Comments:

Last update: December 8, 2025, Prof. Dr. C. Schwarz

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77021 SPO version: 34

Contact lens fitting B

Study program	Optometry
Module coordinator	Prof. Dr. med. Andreas Holschbach
Module type	Compulsory module
Semester	4th semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives

Technical skills

Professional competence ("knowledge and understanding" and "skills"): Students can describe the geometries and designs of the various types of toric contact lenses. They can apply common technical terms and can proceed systematically when fitting toric rigid and soft contact lenses.
Students can justify contact lens fitting in special cases such as bifocal lenses, tendency to deposit, and videotopographic peculiarities. Students can transfer the basics of fitting rotationally symmetrical contact lenses. They are able to name the common technical terms for videotopography, toric lenses, bifocal lenses, and special fittings.

Students can name all relevant technical parameters and their determination and are able to use them to perform and verify goal-oriented and optimized contact lens fittings. Students analyze the topography and refraction, calculate and select the appropriate toric lens, interpret the fluoroscopic image, and evaluate the fit. Students can create protocols**.**

Interdisciplinary skills

Through mutual practice during the internship, students can work on tasks together and resolve conflicts within the team. By mutually fitting and inserting contact lenses, students practice interacting with other people and overcome inhibitions. Students can communicate with test subjects and future customers.

Learning content Theory:
Manufacture and finishing of dimensionally stable contact lenses
Monomeric starting materials for contact lens materials
Structure and resulting properties of
contact lens materials
Quality control and normative tolerances of hydrogel contact lenses
Selection, assessment, individual adaptation, and targeted modification of the fit of spherical and toric hydrogel contact lenses with
different back surface geometries and replacement intervals
Manufacture of hydrogel contact lenses
Optical characteristics of
contact lenses compared to glasses
Contact lenses for astigmatism.
Practical training:
Post-processing of dimensionally stable contact lenses
Determination of parameters and quality control of hydrogel
contact lenses

The Will be announced in the first lecture.

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77403	Contact lens fitting 3	Prof. Dr. med. Andreas Holschbach, Staff	V,L	6	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77403	PLK (60 minutes)	100	

Requirements for admission to the module examination
Participation in the practical course or submission of the laboratory report

Further feedback during the course
Participation in the contact lens consultation. Independent contact lens fitting, documentation, and evaluation by the customer.

[1] *V Lecture, L Laboratory, S Seminar, PR Internship, EX Experiment, X Not fixed, E Excursion, Ü Practical, P Project, K Colloquium, EL E-learning*
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

[2] *PLK Written exams, PLR Presentation, PLL Laboratory work, PLT Learning diary, PLS Term paper/research report, PLE Draft, PLF work, PMC Multiple choice, PLM Oral examination, PLP Project, PPR Portfolio, PLC Multimedia-based exam, PLA Practical work, Internship, (e-exam)*
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Comments: ---

Last update: January 14, 2023

Module number: 77022 SPO version: 34

Optometric Diagnostics C

Course	Optometry
Module coordinator	Prof. Dr. J. Ungewiß
Module type	Compulsory module
Semester	4th semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation in module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students will be able to describe various methods for testing binocular vision in depth and apply them in practice. They will be able to identify and explain potential factors that can lead to impaired binocular vision and analyze their influence. They can test the specific test arrangements and the targeted procedure for testing binocular vision in practice and can interpret the results correctly. Through the internship, students can practice manual skills and communication techniques for binocular testing.

Interdisciplinary skills

Through mutual practice in the internship, students are able to work on tasks in a team and resolve conflicts. Through the self-study component, students can create supplementary handouts and/or presentations (optional).

Learning content: Retinal correspondence
Vieth Müller, horopter
Stereopsis, stereoscopes, stereograms, synoptophor, Pulfrich
Panum's areas

Accommodation and convergence
Resting positions, convergence components (theory and practice) AC/A and A/CA (theory and practice)

Testing muscle balance

Dissociated, associated, fixation disparity (theory and practice)
Analytical measurement method
Measurement of key parameters, relative vergence, fusion widths
Analysis of results

Primary motor anomalies
Concomitant strabismus
Incomitant strabismus

Secondary sensory abnormalities
Check fixation
Test and diagnose correspondence, Bagolini, afterimage test.
Suppression tests, Worth, red glass, prism test

Functional tests, general screening
-Cover/uncover (theory and practice)
-Near point of convergence (theory and practice)
-Eye motility, smooth eye movements, saccades (theory and practice)

Literature

Basic literature:

- Diepes: Refraction determination
- Dietze: The optometric examination
- Lachenmayr, Friedburg, Buser: Eye - Glasses - Refraction

Further reading:
- Kaufmann (ed.): Strabismus

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77404	Binocular vision 2	Prof. Dr. Judith Ungewiß, Lecturer, Staff	V,L	6	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
7740	PLK (60 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course Comments:

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1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam (e-exam)
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Last update: September 30, 2024, Prof. Dr. Judith Ungewiß

Module number: 77023 SPO version: 34

Special Optometry

Course	Optometry
Module coordinator	Prof. Dr. med. Andreas Holschbach
Module type	Compulsory module
Semester	4th semester
Module duration	1 semester
Number of courses	2
Frequency	Summer
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students will be able to describe the variety of magnifying visual aids, their areas of application, and their optical and anatomical adaptation. They will be able to classify the clinical pictures that lead to visual impairment and analyze their possible effects on the personal circumstances of an affected person. They will be able to select suitable aids and justify their choice.

Interdisciplinary skills

Students will be able to deal with the problems of visually impaired people and communicate with them appropriately. They will be able to provide social support by offering competent advice to visually impaired people and will develop an empathetic awareness of their psychological situation.

Learning content

Low Vision 1:
Introduction to low vision
Connection between visual and functional impairment
Adapted examination methods in relation to low vision
Measuring visual acuity and contrast sensitivity
Determining magnification requirements
Analysis of various visual field impairments
Various magnifying aids
Glare, special lighting, and filters

Eye diseases

Clinical pictures primarily of the anterior segment of the eye.

Literature

Low vision 1

Basic literature:
- Diepes H, Krause K, Rohrschneider K: Visual impairment

Further reading:
- Hammerstein W: Rehabilitation in Ophthalmology
- LowVision Foundation (ed.): Interdisciplinary LowVision Congress - Diagnostics - Therapy - Rehabilitation
- Lund OE, Waubke TN (eds): Ophthalmological Rehabilitation
- Wagner E: Visual impairment and social skills

Ophthalmology Lang / Lang
Textbook/study literature
Book incl. online use. Hardcover
7th, revised edition. 2024
448 pages with 600 illustrations. Includes online version in via medici.
Thieme. ISBN 978-3-13-245444-6

Similar literature: Franz Grehn, Ophthalmology, 2019; Sachsenweger, Ophthalmology, 1987

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77406	Low Vision 1	Zumkeller	V,Ü,L	2	2
77405	Introduction Eye diseases	Holschbach	V,Ü,L	2	3

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77406, 77405	PLK (90 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: April 4, 2025, Prof. Dr. med. Andreas Holschbach

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77024 SPO version: 34

Technological and scientific fundamentals C

Course	Optometry
Module coordinator	Prof. Dr. Christina Schwarz
Module type	Compulsory module
Semester	4th semester
Module duration	1 semester
Number of courses	2
Frequency	Summer
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives

Technical skills

Students can describe eyeglass lenses for a vision-impaired eye, distinguish between astigmatism and refractive errors, and analyze their effects. They can recognize aspheric and prismatic eyeglass lenses and interpret their effects.
Students are able to comprehensively prepare a scientific paper in the field of optometry and present it in the form of a standardized written synopsis. They are able to critically review scientific content, present it in a technically correct manner, and document it.

Interdisciplinary skills

Through exercises, students are able to solve tasks together as a team and discuss technical issues. This promotes their independence and personal responsibility.

Learning content

Eyeglass lens technology 3:
Optical and technical properties of modern (individual/personalized) single vision and progressive lenses, the physiological-optical, chemical, and mechanical properties of materials, hard coatings, anti-reflective coatings, clean coats, and tints.
Interpretation of standards and patents.

Study design and literature research:
Working with scientific literature (correct referencing of literature sources, literature research: databases, search functions and evaluation of search results, literature management)
Statistics (simple characterization of correlations, selected parametric and non-parametric methods)
Study design and study planning (selected study types: observational and interventional studies, open/blind, prospective/retrospective; study protocol and ethical considerations; determination of case numbers)
Analysis of published studies (research question, project implementation, evaluation of statistical methods used, conclusions)

Literature

Diepes, Blendowske: Optics and Technology of Eyeglasses, DOZ-Verlag
Further references will be announced in the lecture (depending on the project)

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77407	Eyeglass Lens Technology 3	Prof. Dr. Christina Schwarz	V,Ü,L	3	4
77408	Study design and literature review	Prof. Dr. Christina Schwarz	V,Ü,P	1	1

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of the module grade	Comment
77407, 77408	PLF	Short written test during the semester 70% Presentation and report 30%	

Requirements for admission to the module examination:

Further feedback during the course

Comments:

Last update: December 8, 2025, Prof. Dr. C. Schwarz

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77026 SPO version: 34
Vocational and Work Education Safety Engineering Optometry Optometry

Degree program	B.Sc. Optometry/Optometry
Module name	Vocational/Work Education and Safety Engineering Optometry/Optometry
Module coordinator	Prof. Dr. Anna Nagl
Module type	Compulsory module
Semester	7th semester
Module duration	1 semester
Number of courses	
Frequency	Winter
Credits	5
Workload Attendance	75
Workload for self-study	75
Participation requirements requirements for module	The practical study semester must have been successfully completed.
Use in other other degree programs	
Language	German

Module objectives

General
After successfully completing this module, students will be able to understand, apply, and further develop the course content. This will enable graduates to "train" others and organize occupational safety in their future professional practice. Students will also be able to comply with legal obligations in occupational safety.

Technical skills

77709 Vocational and occupational pedagogy in optometry/optometry:

General: The competencies correspond to the qualification as a trainer: Fulfilment of the AEVO - Trainer Aptitude Ordinance - cf. the Ordinance on the Master Craftsman's Examination Part IV in the Skilled Trades and Crafts (General Master Craftsman's Examination Ordinance - AMVO) of October 26, 2011

Technical competence:

Field of activity 1: Checking training requirements and planning training

Students are able to check and evaluate training requirements on the basis of operational, job-related, and legal provisions, and to plan training, also taking into account external training periods.

Field of activity 2: Preparing training and hiring trainees

Students are able to carry out training preparation tasks, determine selection criteria for recruitment, and carry out recruitment procedures in accordance with the German Vocational Training Act ( ), taking into account company work and business processes as well as legal aspects.

Field of action 3: Carrying out training

Students are able to plan and monitor learning processes in an action-oriented manner and to promote independent learning. In doing so, they can take into account

typical work and business processes as well as the trainees' possible areas of application and learning requirements.

Area of action 4: Completing training

Students are able to successfully complete their training and identify prospects for further learning and qualification paths.

77710 Safety technology in ophthalmic optics/optometry

Students can describe the basics of occupational safety and health at work with regard to the fields of ophthalmic optics/optometry. They can assess measures for the prevention of occupational accidents, occupational diseases, and work-related health hazards and are able to carry out risk assessments, provide instruction, and administer first aid.

Interdisciplinary skills
Students are able to transfer what they have learned into practice within the framework of work instructions, apply their communication and teamwork skills, and take on responsibility as future trainers and, if necessary, safety officers.

Course content

77709 The vocational and occupational pedagogy of ophthalmic optics/optometry compulsory lecture is required for the training permit, cf. § 22 Crafts and Trades Regulation Code / § 3 Trainer Aptitude Ordinance AEVO

The content and the qualifications obtained comply with the Training Suitability Ordinance (AEVO) and are structured according to the four fields of activity:
1. Checking training requirements and planning training
2. Preparing training and assisting in the recruitment of trainees,
3. Carrying out training, and
4. Completing training

77710 Safety Technology/Entrepreneurial Model Optometry/Optometry Compulsory lecture
- Occupational safety, accident prevention, professional associations
- First aid
- Fire protection
- Inspection of electrical systems and equipment
- Safety officers
- Instruction
- Company medical care
- Hazardous substances, operating instructions, protective equipment
- Risk assessment

Literature

Vocational and occupational education Optometry/optometry:

- Current script in Canvas

- Semper, L./Gress, W./Franke, K. (current edition): Vocational and Work Education [Vol. 3]. For practical preparation for the Master Craftsman Examination IV and the Trainer Aptitude Examination. With case-related practice and exam questions. Holzmann Verlag: Bad Wörishofen.

Safety Technology in Optometry/Optometry

- Scripts and documentation in LMS Canvas

- Further reading: UVVs of the professional associations

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77709	Vocational/Work Education and Safety Engineering Optometry/Optometry	Prof. Dr. Anna Nagl/ Lecturer	V,Ü	4	4
77710	Safety Engineering/Entrepreneurial Model in Optometry/Optometry	Prof. Dr. Anna Nagl/ Lecturer	V	1	1

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77709	PLL 25 minutes PLK 180 minutes	Weighting according to the credit points of the courses within the module: 80	See below under "Comments"
77710	PLK 30 minutes	Weighting according to the credit points of the courses within the module: 20	See below under "Comments"

1 ***V*** *Lecture* ***L*** *Laboratory* ***S*** *Seminar* ***PR*** *Internship* ***EX*** *Experiment* ***X*** *Not fixed*
E *Excursion* ***Ü*** *Practical* ***P*** *Project* ***K*** *Colloquium* ***EL*** *E-learning*
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 ***PLK*** *Written exams* ***PLR*** *Presentation* ***PLL*** *Laboratory work* ***PLT*** *Learning diary*
PLS *Term paper/research report* ***PLE*** *Draft* ***PLF*** *Portfolio* ***PMC*** *Multiple choice*
PLM *Oral examination* ***PLP*** *Project* ***PPR*** *Internship* ***PLC*** *Multimedia-based Examination (e-exam)*
PLA *Practical work*
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Prerequisites for admission to the module examination
The practical study semester must have been successfully completed prior to this module in order to provide the necessary insight into practical work and operational processes.

Further feedback during the course

Com**ments**:
Both courses:
- Vocational and work pedagogy (equivalent to the Trainer Aptitude Ordinance = Part IV of the master craftsman examination) and
- Safety Technology/Entrepreneurial Model
are required in order to be allowed to run or train in optometry/optometry. Separate examination certificates are required for the chambers of crafts and professional associations!

Reason for multiple performance certificates

1. Course 77709 "Vocational and Work Education in Optometry/Optometry"
a) The practical ungraded work instructions (PLL) required in course 77709 are completed during the semester. In this way, cross-semester teamwork (social skills) is also practiced.
b) 180-minute exam during the examination period: Verification of technical knowledge is required in accordance with the Trainer Aptitude Ordinance (AEVO) so that the equivalence can be certified in the Diploma Supplement for every bachelor's graduate at no additional cost. The exam is conducted in the form of a single-choice DigiExam.

2. Course 77710 "Safety Technology in Optometry/Optometry"
30-minute single-choice DigiExam exam during the semester

Last update: December 21, 2022, Prof. Dr. Anna Nagl, January 13, 2023 Nolting (SWS corrected according to SPO)

Module number: 77028 SPO version: 34

Contact lens fitting C

Course	Optometry/Optometry
Module coordinator	Prof. Dr. med. Andreas Holschbach
Module type	Compulsory module
Semester	7th semester
Module duration	1 semester
Number of courses	1
Frequency	Winter
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Participation prerequisite Module	
Use in other SG	
Language	German

Module objectives

Technical skills

Students will be able to recognize complications in contact lens fitting, identify their significance and prophylaxis, and apply this knowledge appropriately.
Students are able to analyze and evaluate complications in contact lens fitting, classify their significance, and draw conclusions about necessary changes or treatments. They can transfer their knowledge of rotationally symmetrical and toric lenses to contact lens fitting for customers. In doing so, they can apply contact lens care strategies to customers.

Interdisciplinary skills

During the weekly customer afternoons, students can plan and organize all relevant fitting appointments. They are able to analyze individual customer needs and provide care accordingly.

Students can determine all relevant subject-specific parameters and are able to use them to solve complications in contact lens fitting in a goal-oriented and case-specific manner. Where possible, the library provides instruction in the method of interlibrary loan of literature; publications are prepared and compiled alongside the presentation.

Learning content

Theory:
Complications in
contact lens fitting and problem management
Fitting of special lenses

Practical training:
Independent participation in contact lens consultations

Literature

Antony J. Phillips, Lynne Speedwell: Contact Lenses 4th Edition or higher.
Contact Lens Wiki 2020, A. Holschbach; Lecturer's script

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77707	Contact lens fitting 4	Prof. Dr. med. Andreas Holschbach, Staff	V,L	6	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77707	PLK (60 minutes)	100	

Requirements for admission to the module examination
Participation in the practical course or submission of the laboratory report

Further feedback during the course of study
Participation in the contact lens consultation. Independent contact lens fitting, documentation, and evaluation by the customer.

Comments: ---

Last update: March 28, 2025, Prof. Dr. A. Holschbach

[1] *V Lecture* *L Laboratory* *S Seminar* *PR Internship* *EX Experiment* *X Not fixed*
E Excursion *Ü Practical* *P Project* *K Colloquium* *EL E-learning*
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

[2] *PLK Written exams* *PLR Presentation* *PLL Laboratory work* *PLT Learning diary*
PLS Term paper/research report *PLE Draft* *PLF Portfolio* *PMC Multiple choice*
PLM Oral examination *PLP Project* *PPR Internship* *PLC Multimedia-based exam (e-exam)*
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77036 SPO version: 34

Fundamentals of Medicine and Clinical Practice

Course	Optometry
Module coordinator	Prof. Andreas Holschbach, MD
Module type	Compulsory module
Semester	6th semester
Module duration	1 semester
Number of courses	2
Frequency	Summer
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students will be able to describe the morphology, function, and pathological changes of the visual organ. They will be able to present and describe their effects on the patient's vision. They will be able to recognize and describe the connection between systemic diseases and their effects on the eye.

Interdisciplinary skills

Through their knowledge of pathological changes in the eye, the interaction between systemic diseases and the eye, and their effects on the patient's vision, students are able to demonstrate an understanding of the psychological stress experienced by patients with existing disorders and defects. They are also able to independently organize further information on relevant topics.

Learning content

Eye diseases

Clinical pictures primarily of the posterior segment of the eye.

Supplements Eye diseases and contact lenses

Supplements to eye diseases and in-depth study of special contact lens fittings and special contact lens geometries. Customer service

Literature

Lang / Lang: Ophthalmology
Textbook/study literature
Book incl. online use. Hardcover
7th, revised edition. 2024
448 pages with 600 illustrations. Includes online version in via medici.
Thieme. ISBN 978-3-13-245444-6

Similar literature: Franz Grehn, Ophthalmology, 2019; Sachsenweger, Ophthalmology, 1987

Antony J. Phillips, Lynne Speedwell Contact Lenses 4th Edition or higher.
Contact Lens Wiki 2020, A. Holschbach
Lecturer's script

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77409	Eye diseases	Prof. Andreas Holschbach, MD	V	3	2
77410	Additions Eye diseases and contact lenses	Prof. Andreas Holschbach, MD	V	3	3

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77409, 77410	PLK (90 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: March 28, 2025, Prof. Dr. med. Andreas Holschbach

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77040 SPO version: 34

Applied Optometry

Course	Optometry / Optometry
Module coordinator	Prof. Dr. NN
Module type	Compulsory module
Semester	7th semester
Module duration	1 semester
Number of courses	1
Frequency	Winter
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students will be able to evaluate, differentiate, and interpret optometric treatment procedures, particularly in test subjects, according to recognized scientific standards. They will be able to document the results in a standardized manner and defend them in a plenary session.

Interdisciplinary skills
Students are able to work independently within the framework of a project.

Learning

Applied optometric topics and methods, practical examples from the fields of sports optometry, pediatric optometry, binocular vision, visual training

Literature

To be announced

Courses included

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77708	Applied Optometry	NN	V,Ü,L,	4	5

[1] *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[1]	Determination of module grade	Comment
77708	PLF	20% presentations, 50% practical patient care, 30% case documentation	

Requirements for admission to the module examination

Further feedback during the course of study
Feedback on the case documentation presented

Comments:

Last update: January 17, 2023, Prof. Dr. Paffrath

1 *PLK Written exams* *PLR Presentation* *PLL Laboratory work* *PLT Learning diary*
PLS Term paper/research report *PLE Draft* *PLF Portfolio* *PMC Multiple choice*
PLM Oral examination *PLP Project* *PPR Internship* *PLC Multimedia-based exam (e-exam)*
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77500 SPO version: 34
Practical semester in ophthalmic optics and optometry

Degree program	B.Sc. Optometry/Optometry
Module name	Practical study semester in ophthalmic optics/optometry
Module coordinator	Head of Internship Office for the degree program
Module type	Compulsory module
Semester	5th semester
Module duration	1 semester
Number of courses	
Frequency	Winter
Credits	30
Workload Attendance	15
Workload for self-study	8
Participation requirements requirements for module	Regulated in the currently valid SPO
Use in other other degree programs	
Language	German/English depending on field of activity/company

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Module objectives

General
Details on the practical semester are regulated in Chapter II (2) of these SPO.

Technical skills
Students are able to apply their knowledge and skills in practice. Students are able to independently perform refractions, contact lens fittings, consultations, sales talks, and projects, and to critically reflect on them.

Interdisciplinary skills
Students are able to apply what they have learned in their studies to date with customers and colleagues in a manner appropriate to the situation.

Learning content

77501
- Participation in the preparatory seminars offered within the degree program
- Job application training
- Organized exchange of experiences with students who have already completed an internship semester
- Organization of the internship position(s)

77502
- "Guided" internships in accordance with the specifications in the SPO for the "practical semester"

77503
- Preparation of an approx. 20-page informative practical semester report in accordance with scientific standards and a presentation (colloquium)
- Feedback on the practical semester report

Literature

Depending on the area of activity in the company; literature recommendations for scientific work will be provided in the lecture "Preparation

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77501	Preparatory seminar Practical study semester in ophthalmic optics/optometry	Internship coordinator for the degree program	V	1	
77502	Practical study semester in ophthalmic optics/optometry	Supervisors in the company or institution	P		30
77503	Colloquium Practical semester in ophthalmic optics/optometry	Head of the internship office for the degree program	P		

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of the module grade	Comments
	PPR/PLS	Un graded	Practical semester report and colloquium Practical study semester

Requirements for admission to the module examination
This is regulated in Chapter II (2) of these SPO.

Further feedback during the course of study

Com**ments**:
In the colloquium "Practical Study Semester in Optometry/Optometry," students in their 6th or 7th semester (in the 7th semester, students who were abroad in the 6th semester) present the practical semester positions and selected practical cases to students in their 3rd or 4th semester. As this is only a single session (approx. 10 minutes per student), no formal attendance time (SWS) is specified in this module description for the Practical Study Semester colloquium.

Last update: December 21, 2022, Prof. Dr. Anna Nagl, January 13, 2023 Nolting (exam form P according to SPO)

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based Examination (e-exam)
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77801 SPO version: 34
Project Management

Degree program	B.Sc. Optometry/Optometry
Module name	Project: Management
Module coordinator	Prof. Dr. Anna Nagl
Module type	Elective module
Semester	Any time
Module duration	1–2 semesters
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	60
Workload for self-study	90
Participation requirements Prerequisite Module	
Use in other other degree programs	
Language	German

Module objectives

Technical skills
Students will be able to analyze and structure problems in the field of optometry/optometry or business administration and develop solutions based on scientific research techniques. They will be able to classify and explain their findings in the context of evidence-based optometry/optometry.

Interdisciplinary skills
Students can demonstrate the ability to identify a feasible problem/project in the field of optometry/optometry or business administration and develop a discussion about its relevance in science. They are able to use scientific methods to design a plausible solution to the identified problem and carry out validation procedures to determine the effectiveness of the proposed solution. Students are able to summarize and present their findings.

Learning content

- Fundamentals of scientific research
- Quantitative and qualitative methodology of empirical social sciences
- Research/project design

Literature

- Current lecture notes are available on the LMS (Learning Management System) Canvas.
- Further literature recommendations will be announced in the lecture.

Included courses (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77610	Project: Management	Prof. Dr. Anna Nagl	V	4	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comments
	PLP 15 minutes		

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: December 21, 2022, Prof. Dr. Anna Nagl, January 6, 2023 U. Paffrath

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based Examination (e-exam)
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77803 SPO version: 34

App Development

Study	Optometry
Module coordinator	Prof. Dr. Jürgen Nolting
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Participation prerequisite Module	
Use in other SG	Acoustics and Audiology
Speech	German

Module objectives **Technical skills**

Students learn how to use the Android Studio development environment and how to design apps for the Android operating system with this tool. In particular, they can access sensors integrated into smartphones to record optical and acoustic signals and visualize them.

Interdisciplinary skills
Students will be able to work on programming tasks in small groups. They will be able to discuss their work and organization within the team and solve tasks independently.

Learning content

Basics of using Android Studio
Creation of simple apps in the emulator and on the smartphone
Sample apps for visual and acoustic calculations
Access to sensors: light meter, microphone
Visualization of data streams

Literature

Suitable scripts are provided via the learning platform

Courses included

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77613	App development	Nolting	V,Ü	4	5

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[1]	Determination of module grade	Comment
7761	PLM (15 minutes) graded	100	

Requirements for admission to the module examination
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Further feedback during the course --

Comments: --

Last update: December 7, 2022, Prof. Dr. J. Nolting

1 *PLK Written exams* *PLR Department* *PLL Laboratory work* *PLT Learning diary*
PLS Term paper/research report *PLE Draft* *PLF Portfolio* *PMC Multiple choice*
PLM Oral examination *PLP Project* *PPR Internship* *PLC Multimedia-based exam (e-exam)*
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77804 SPO version: 34

Matlab / Python

Study	Optometry
Module coordinator	Prof. Dr. Jürgen Nolting
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	90 hours
Workload Self-study	60 hours
Prerequisite for participation Module	
Use in other SG	Audiology and hearing acoustics
Speech	German

Module objectives **Technical skills**

Students will be able to evaluate the use of MATLAB software and the Python interpreter and explain the basics. They will be able to program in Python. In particular, they will be able to apply complex vector-based mathematical calculations.

Interdisciplinary skills
Students can work on programming tasks in small groups. They can discuss their work and organization within the team and solve tasks independently.

Learning content

Basics of using MATLAB
Calculating with numbers, vectors, and matrices
Graphical representation
Signal processing (acoustic)
Image processing
Symbolic mathematics

Working with the Python interpreter
Input/output
Arithmetic operations
Flow control
Functions

Literature

Suitable scripts are provided via the learning platform

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77614	Matlab / Python	Nolting	V,Ü	6	5

[1] *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[1]	Determination of module grade	Comment
7761	PLM (15 minutes) graded	100	

Requirements for admission to the module examination
The programming exercises in module 77614 must have been successfully completed.

Further feedback during the course --

Comments: --

Last update: April 28, 2023, Prof. Dr. J. Nolting

1 *PLK Written exams* *PLR Presentation* *PLL Laboratory work* *PLT Learning diary*
PLS Term paper/research report *PLE Draft* *PLF Portfolio* *PMC Multiple choice*
PLM Oral examination *PLP Project* *PPR Internship* *PLC Multimedia-based exam (e-exam)*
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77805 SPO version: 34

Visual Ergonomics

Course	Optometry
Module coordinator	Prof. Dr. NN, Dr. Judith Ungewiß
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	1
Frequency of offers	Summer semester
Credits	5 CP
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisites for participation requirements Module	None
Use in other SG	---
Language	German

Module objectives **Technical skills**

Students will be able to demonstrate their knowledge of ergonomics and assess the importance of ergonomics in relation to work processes, workplace design, human-machine interfaces (HMI), and user-friendliness. They analyze the specific importance of ophthalmic optics for ergonomics-related topics and their interrelationships with driving, control, monitoring, and screen-related activities, also with regard to people with congenital, acquired, or age-related impairments of the visual system. As part of integrated, topic-related project work, you will research the current state of the art independently or in a team, design and generate your own solutions, and evaluate them in terms of their usability and suitability for everyday use.

Interdisciplinary skills

Teamwork and conflict management skills are promoted in particular through planning and development activities within the framework of project work.

These activities also develop communication skills, role flexibility, and empathy. Independence, motivation, and willingness to perform are promoted through the amount of self-study required to prepare supplementary handouts and/or presentations on the lecture content. In particular, students are trained in dealing with other people in examination situations and in overcoming inhibitions.

Learning content

- Fundamentals of ergonomics
- Identification of potential areas of interaction between ergonomics, optometry, and visual functions
- Optical-relevant ergonomics-related suitability criteria and assessment procedures
- Elementary basic knowledge of visual exploration strategies and eye/hand coordination
- Significance of ergonomics-related aspects for driving, steering, and monitoring activities (basic knowledge of occupational health checkup G 25)
- Significance of ergonomics-related aspects for screen-based activities (basic knowledge of occupational health check-ups G 37)

Application of the above knowledge in the form of independent project work relating to workplace or leisure/sports-related activities

Literature

Schmauder, Martin and Spanner-Ulmer, Birgit: Ergonomics. Fundamentals of interaction between humans, technology, and organization. 1st edition. Carl Hanser Verlag, Munich, 2014
(ISBN: 978-3446441392)

Schmidtke, Heinz and Jastrzebska-Fraczek, Iwona: Ergonomics: Data on system design and definition of terms. Carl Hanser Verlag, Munich, 2013
(ISBN: 978-3-446-43480-6)

Federal Institute for Occupational Safety and Health (publisher), Lange, Wolfgang and Windel, Armin: Small Ergonomic Data Collection. 15th edition. TÜV Media GmbH, TÜV Rheinland Group, Cologne, 2013

Long, Jennifer (2014) What is Visual Ergonomics? WORK 47: 287-289
DGUV, German Social Accident Insurance (ed.): Occupational Health Care – Principles of the German Social Accident Insurance for Occupational Health Care
Preventive Medical Care. 5th completely revised edition. (September 3, 2010).

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77615	Visual Ergonomics	NN, Judith Ungewiß	V,P	4	5

Module examination (prerequisite for the awarding of credit points)

Course No.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77615	PLK (60 minutes)	50	
77615	PLP	50	

Requirements for admission to the module examination

Further feedback during the course
Feedback on group work

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1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Comments:

Last update: November 30, 2022, Judith Ungewiß

Module number: 77806 SPO version: 34

Project Experimental Optometry

Study	Optometry
Module coordinator	Prof. Dr. Jürgen Nolting
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German / English possible for English-speaking participants

Module objectives **Technical skills**

Students are able to plan and work on a project in the field of experimental optometry. They are able to weigh and document content in a technically correct manner. They are able to justify decisions in the research project on the basis of their technical knowledge and practical skills.

Interdisciplinary skills
Students will be able to work on the project in small teams, thereby developing team spirit and teamwork skills. Through self-study, they will be able to plan the project process themselves in terms of content and organization.
Students are able to take a structured approach to the project and apply methods for finding solutions.

Learning content Depends on the project

Literature To be announced

Courses included

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77616	Experimental Optics Project	All professors	P,V,Ü,L		5

[1] *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

Module examination (prerequisite for the awarding of credit points)

Course No.	Type and duration of performance assessment[1]	Determination of module grade	Comment
7761	PLP (60 minutes) graded	100	

Requirements for admission to the module examination --

Further feedback during the course --

Comments: --

Last update: November 27, 2022, Prof. Dr. U. Paffrath
January 13, 2023, Prof. Dr. J. Nolting

1 *PLK Written exams* *PLR Presentation* *PLL Laboratory work* *PLT Learning diary*
PLS Term paper/research report *PLE Draft* *PLF Portfolio* *PMC Multiple choice*
PLM Oral examination *PLP Project* *PPR Internship* *PLC Multimedia-based exam (e-exam)*
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77807 SPO version: 34

Technical Optics

Course	Optometry
Module coordinator	Prof. Dr. Jürgen Nolting
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	2
Frequency	Summer
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students will develop applicable technical knowledge and thus an understanding of interdisciplinary and cross-disciplinary relationships in the fields of ophthalmic measurement technology and imaging and image processing optoelectronic systems. They will be able to classify different image acquisition and reproduction methods in order to evaluate suitable camera and display systems. Through the laboratory internship, students will be able to plan the systematic approach to measurements in the field of technical optics, carry out these measurements, analyze and discuss the measurement results, and formulate test reports for the individual experiments.

Interdisciplinary skills
Students can discuss the procedure and evaluation of the experiments in working groups and question the experimental results (transfer and moderation skills, teamwork and conflict management skills). Students can independently plan challenging laboratory experiments and formulate the experimental results in scientific language in the form of technical reports that meet the requirements of ISO 5966 and DIN 1422.

Learning content

Electronic image transmission, CRT and LC displays, electronic cameras, technical fundamentals of image processing, night vision and infrared technology

Introduction to the preparation of technical reports; laboratory experiments: autocollimation vertex refractive index measuring device, CTF determination using the example of a video camera, dynamic behavior of photochromic lenses, visual acuity measurement through various binoculars, Köhler illumination (microscopy), goniometry, thermography, spectrometry

Literature

Recommendation:
L. and H. Hering: Technical Reports – Structuring, Designing, Presenting. Vieweg Publishing House
F. Bestenreiner: From Point to Image. H. Wichmann Publishing House

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77617	Image technology	Nolting	V	2	2
77618	Technical Optics Laboratory	Nolting	L	4	3

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
7761	PLK (60 minutes) graded	100	

Prerequisites for admission to the module examination
Laboratory 77618 must have been successfully completed.

Further feedback during the course
Discussion of laboratory reports

Comments: --

Last update: December 7, 2022, Prof. Dr. J. Nolting

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77809 SPO version: 34

Scientific work

Study	Optometry
Module coordinator	Dr. Judith Ungewiß
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Prerequisite for participation requirements Module	None
Use in other SG	---
Language	German

Module objectives **Technical skills**

Students are able to comprehensively prepare a scientific paper in the field of optometry and present it in the form of a standardized written synopsis. They are able to critically review scientific content, present it in a technically correct manner, and document it. They are able to apply their technical knowledge and practical skills within the framework of this project and use them for future scientific activities.

Interdisciplinary skills
Students are able to work on the project in small teams, thereby developing team spirit and teamwork skills. Through self-study, they are able to plan the project process themselves in terms of content and organization.

Learning content
Depending on the individually selected project topics, these will be announced.
In any case: literature research and creation of a study synopsis (study plan).

Literature
Depends on the individually selected project topics.
Will be announced.

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77620	Scientific Work	NN, Judith Ungewiß	V,Ü	4	5

[1] *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[1]	Determination of module grade	Comment
7762	PLP	100	

Requirements for admission to the module examination

Further feedback during the course
Feedback on group work

Comments:

Last update: December 5, 2022, Judith Ungewiß

1 *PLK Written exams* *PLR Presentation* *PLL Laboratory work* *PLT Learning diary*
PLS Term paper/research report *PLE Draft* *PLF Portfolio* *PMC Multiple choice*
PLM Oral examination *PLP Project* *PPR Internship* *PLC Multimedia-based exam (e-exam)*
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77810 SPO version: 34

Optometry project

Study	Optometry
Module coordinator	Prof. Dr. NN
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	60 hours
Workload for self-study	90 hours
Participation prerequisite Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

The project work prepares students for their bachelor's thesis. Students learn to analyze scientific questions, develop possible solutions, and select appropriate statistics. The results are published at the end.

Interdisciplinary skills
Students develop their independence through project work. They are able to communicate with clients and present their results to them.

Learning content

Appropriate cooperation with the client
Analysis of the issue
Development of a suitable study design
Selection of suitable statistical methods
Conducting any necessary (field) experiments, measurements, analyses, or similar
Review of the study design and statistics based on the results and findings
Completion of the study protocol
Presentation to the client

Literature

To be announced

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77621	Optometry Project	NN	V,P	4	5

[1] *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[1]	Determination of module grade	Comment
7762	PLK (60 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: January 16, 2023, Prof. Dr. Paffrath

1 *PLK Written exams* *PLR Presentation* *PLL Laboratory work* *PLT Learning diary*
PLS Term paper/research report *PLE Draft* *PLF Portfolio* *PMC Multiple choice*
PLM Oral examination *PLP Project* *PPR Internship* *PLC Multimedia-based exam (e-exam)*
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77811 SPO version: 34

Context training A

Study program	Optometry
Module coordinator	Prof. Dr. NN
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	2
Frequency	Summer
Credits	5
Workload Attendance	45 hours
Workload for self-study	105 hours
Participation requirements Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students can reflect on the legal and ethical aspects of their actions and anticipate and question the possible consequences of their actions. The Writing Practice module promotes written language skills. Students can express themselves correctly both orally and in writing and are able to apply research methods for academic work.

Interdisciplinary skills
Students learn to take personal responsibility through self-study. They are able to evaluate the consequences of their work and can resolve conflicts accordingly.

Learning content

Law:
Legal system, property and inheritance law, contracts for work and labor law, contracts for transfer of use, general contract law and sales contracts, corporate law

Ethics:
Virtue ethics (Aristotle and new approaches); principle ethics (Kant, utilitarianism, and newer positions); responsibility ethics (Hans Jonas); professional ethics (codes of conduct; associations); human rights; solving specific case studies

Writing practice:
Text-oriented quality criteria
Writing as a process
Academic work (research, bibliography, referencing)
Scientific integrity
Text types
Exercises

Literature To be announced

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77622	Law+Ethics	NN	V	1	5
77623	Writing practice	NN	V,Ü	2	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77622, 77623	PLK (60 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: January 16, 2023, Prof. Dr. Paffrath

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77812 SPO version: 34

Context training B

degree program	Optometry
Module coordinator	Prof. Dr. NN
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	2
Frequency	Summer
Credits	5
Workload Attendance	45 hours
Workload for self-study	105 hours
Prerequisite for participation Module	
Use in other SG	
Language	German (LV 77625), English (LV 77624)

Module objectives **Technical skills**

Students can communicate in English with colleagues, customers, and in academic discussions. They can argue logically and express their opinions. They are able to speak, present, and negotiate effectively, taking into account their knowledge of various communication models and disruptions.

Interdisciplinary skills
Students learn to take responsibility for their own learning through self-study.

Learning content

English for Optometrists:
understand and create formal documentation
use critical thinking skills to provide peer feedback
write a formal letter and email
demonstrate familiarity with common document formats and follow standard layout and paragraphing conventions
speak coherently on more complex subject-specific topics using a wide range of vocabulary and grammar
inform, persuade, and direct through speaking and writing in more complex contexts
Ethics:
Virtue ethics (Aristotle and new approaches); principle ethics (Kant, utilitarianism, and newer positions); responsibility ethics (Hans Jonas); professional ethics (codes of conduct; associations); human rights; solving specific case studies

Argumentation and rhetoric:
Students mainly learn oral language skills.
They practice effective speaking and logical argumentation as well as negotiation techniques, and communication models and disruptions are also covered.

Literature To be announced

Courses included

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77624	English for Optometrists	NN	V	2	3
77625	Argumentation and rhetoric	NN	V,Ü	1	2

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of the module grade	Comment
77624, 77625	PLK (60 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: January 16, 2023, Prof. Dr. Paffrath

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77813 SPO version: 34

Subject supplements

Degree program	Optometry
Module coordinator	Prof. Dr. NN
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	2
Frequency	Summer
Credits	5
Workload Attendance	45 hours
Workload for self-study	105 hours
Prerequisites for participation Module	
Use in other SG	
Language	German

Module objectives

Technical skills

In the Optometry Supplement project, students deepen their knowledge of topics covered in the Optometry project, e.g., by implementing studies or analyzing study designs.

In the area of ray tracing and aberrations, students can demonstrate the relationships between imaging errors, including with regard to aspherical surfaces. They can use various software tools to visualize Zernike polynomials.

Interdisciplinary skills
Through project work, students strengthen their independence and are able to take on personal responsibility.

Learning content

Ray tracing and aberrations:
Introduction to ray tracing software
Aberrations in ray tracing software, examples
Zernike polynomials, visualization using simulations
Eye models
Image quality with aberrations: MTF, PSF, Strehl ratio
Individual topic assignment

Optometry project area Supplement:
Supplementary exercises and topics for the optometry project, either as preparation or as a supplement.

Literature

To be announced

Courses included (LV)

Course No.	Name of course	Instructor	Type[1]	SWS	CP
77626	Ray tracing and aberrations	NN	V,Ü,L	2	4
77627	Optometry Supplement Project	NN	V,Ü,L	1	1

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
77626, 77627	PLK (60 minutes)	100	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: January 15, 2023, Prof. Dr. Paffrath

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77814 SPO version: 34

Compact course on eyeglass provision

Study program	Optometry / Optometry
Module coordinator	Prof. Dr. NN
Module type	Elective module
Semester	6th semester
Module duration	1 semester
Number of courses	1
Frequency	Summer
Credits	5
Workload Attendance	90 hours
Workload for self-study	60 hours
Prerequisite for participation Module	
Use in other SG	
Language	German

Module objectives **Technical skills**

Students can distinguish between the advantages and disadvantages of different spectacle frames and lenses and advise customers. They apply the various centering and adjustment methods. They know how spectacle lenses are fitted into frames and can check and evaluate them. They can distinguish between different repair methods for spectacles.

Interdisciplinary skills
Students are able to work with test subjects in the context of optometric eyeglass care.

Learning content

Customer advice and care:

- Consulting and care Eyeglass frames
- Lens consultation: single vision, multifocal, custom-made, quality differences
- Medical history interview
- Special glasses: Sunglasses, reading glasses, etc.

Optical and anatomical eyeglass fitting

Eyeglass manufacturing: lens inspection, inspection of manufactured eyeglasses, fitting of lenses into different frames

Special methods/services:

- Repair work for various eyeglass frames
- Options for modifying eyeglasses
- Maintenance of tools and machines

Literature To be announced

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77628	Eyeglass provision	NN	V,Ü,L,	6	5

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
7762	PLK, PLL	PLK 50%, PLL 50%	

Requirements for admission to the module examination

Further feedback during the course of study

Comments:

Last update: April 7, 2023, Prof. Dr. Paffrath

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
PLA Practical work (e-exam)
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77850 SPO version: 34
International Optometry Optometry

Degree program	B.Sc. Optometry/Optometry
Module name	International Optometry
Module coordinator	Prof. Dr. Anna Nagl
Module type	Compulsory elective module
Semester	6th semester
Module duration	1 semester
Number of courses	3
Frequency	Summer
Credits	30
Workload Attendance	30
Workload for self-study	870
Participation requirements requirements Module	
Use in other other degree programs	
Language	English

Module objectives

Technical skills
Students are able to compare the state of future-oriented optometry in the host country with that in their home country and develop corresponding optometric skills in the host country. Students will be able to apply the skills acquired at the foreign partner university in the field of optometry, in particular eye diseases and, for example, pediatric optometry and sports vision in Germany, and, if necessary, specialize accordingly in their professional practice in Germany.

Interdisciplinary skills
Students are able to develop a feel for intercultural skills and, following their semester abroad, explain the status of future-oriented optometry at their respective partner university to their fellow students in the third semester as part of the "International Optometry Colloquium." Students are able to systematically support interested third- and fourth-semester students in planning and organizing the "International Optometry" study semester.

Learning content

77651 Preparing for a stay abroad
- Preparation of the formal requirements for the stay abroad, including application documents for the partner university and for funding programs of the International Office, language tests, visas, etc., if necessary
Organized exchange of experiences with students who have already been abroad
- Organization of studies in coordination with the partner universities and preparation of the learning agreement
- Coordination and approval of the learning agreement by the partner university and Aalen University
- Improvement of language skills, if necessary

77652 Studying abroad
The exact course content is specified in the respective learning agreement
- Lectures
- Laboratory exercises
- Clinical internships
Lectures on "Eye Diseases" and "Contact Lenses" are part of the "compulsory program."

77653 Colloquium on International Optometry
- Ensuring the transfer of findings to the domestic situation
- Review of
    - Self-organization of the stay abroad and
    - Experiences and findings
    - Development of approaches for improvement
- Passing on what has been learned in the form of team coaching to the next students who will be going abroad (learning groups)

Literature

- General information/explanatory videos and presentations/guidelines on the respective partner university developed specifically for this module in the "International Optometry" section in Canvas
- Scripts and literature recommendations from the partner university

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
77651	Preparation for study semester abroad	Prof. Dr. Anna Nagl	V	1	
77652	International Optometry	Professors at partner universities	V, P, Ü, L		30
77653	Colloquium on International Optometry	Prof. Dr. Anna Nagl	P, K	1	

[1] ***V*** *Lecture* ***L*** *Laboratory* ***S*** *Seminar* ***PR*** *Internship* ***EX*** *Experiment* ***X*** *Not fixed*
E *Excursion* ***Ü*** *Practical* ***P*** *Project* ***K*** *Colloquium* ***EL*** *E-learning*

Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[1]	Determination of module grade	Comment
	X	Graded, weighting in accordance with the specifications of the foreign partner university	

Requirements for admission to the module examination

Further feedback during the course of study

Com**ments**:

Last update: December 21, 2022, Prof. Dr. Anna Nagl

1 ***PLK*** ***Written exams*** ***PLR*** ***Presentation*** ***PLL*** ***Laboratory work*** ***PLT*** ***Learning diary***
PLS ***Term paper/research report*** ***PLE*** ***Draft*** ***PLF*** ***Portfolio*** ***PMC*** ***Multiple choice***
PLM ***Oral examination*** ***PLP*** ***Project*** ***PPR*** ***Internship*** ***PLC*** ***Multimedia-based Examination (e-exam)***
PLA ***Practical work***
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 77999 SPO version: 34
General Studies

Degree program	B.Sc. Optometry
Module name	General Studies
Module coordinator	Internship coordinator for the degree program
Module type	Compulsory module
Semester	7th semester
Module duration	Freely selectable
Number of courses	Depends on the selected Studium Generale courses
Frequency	Winter semester, summer semester
Credits	3
Workload	Depends on the selected Studium Generale courses, total workload 90 hours
Workload for self-study	Depends on the selected Studium Generale courses, total workload 90 hours
Prerequisite for participation requirements Module	--
Use in other other degree programs	
Language	German/English, depending on the selected course

Module objectives

General
The courses offered as part of the Studium Generale promote the holistic education of students. The courses complement the respective subject studies with interdisciplinary topics. The courses enable students to engage with fundamental scientific topics and current issues.
Students acquire key qualifications that are important for their future careers. To strengthen students' social skills, volunteer work is encouraged.

Technical skills
Students can familiarize themselves with complex interdisciplinary topics and understand how they are connected. They are able to independently engage with socio-political issues.

Interdisciplinary skills
Depending on the courses they choose, students strengthen their ability to work in teams, improve their time management and/or conflict management skills, or deepen their presentation skills. Students are able to apply the skills they have acquired in a targeted manner.
Students recognize the importance of volunteer work for personal development and for society.

Learning content

Each semester, a thematic focus is offered. The respective learning content is flexible and can therefore be found in the program created for each semester.

Literature

Depending on the course.

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
	Various courses/lectures, which can be found in the Career Center's Studium Generale semester program and the corresponding Studium Generale courses within the degree program.				

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of the module grade	Comment
	PLS	Unrated	Students prepare a comprehensive report on the courses or activities they have attended. The templates and verification forms are provided by the Career Center at Aalen University.

Requirements for admission to the module examination
—

Further feedback during the course of study
e.g., feedback on group work

Comments:

Last update: December 21, 2022, Prof. Dr. Anna Nagl

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based Examination (e-exam)
PLA Practical work
Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32

Module number: 99999 SPO version: 34

Bachelor's thesis

Study	Optometry / Focus on Clinical Optometry
Module coordinator	Prof. Dr. Jürgen Nolting
Module type	Compulsory module
Semester	7th semester
Module duration	1 semester
Number of courses	1
Frequency	Winter
Credits	12
Workload Attendance	
Self-study workload	360 hours
Prerequisites requirements Module	All compulsory modules of the degree program
Use in other study programs	
Language	German, English depending on choice

Module objectives

Technical skills
Students are able to independently work on and critically examine unfamiliar issues in the field of optometry/optometry. They can independently apply theoretical and practical knowledge within the time frame specified in the study and examination regulations. They will be able to solve problems and present their approach and results in an appropriate and comprehensible manner, both in writing and orally. They will be able to combine the work of others with their own ideas. They will be able to apply scientific and technical methods to solve problems. They will be able to discuss topics they have developed themselves in presentations with professors and fellow students.

Interdisciplinary skills
Students can organize themselves and their work. They can critically reflect on their working methods and progress over a longer period of time. They are able to share their approach and results with others.
Students can apply scientific working methods and justify their choices.

Learning content Topic from the subject area of the supervising professor.

In the Clinical Optometry specialization, the topic of the bachelor's thesis must come from the field of optometry, refraction, or contact lenses. The examination board decides on exceptions to this rule.

Literature To be announced

Courses included (LV)

Course no.	Name of course	Instructor	Type[1]	SWS	CP
9999	Bachelor's thesis	All professors of the degree program	P		12

Module examination (prerequisite for the awarding of credit points)

Course no.	Type and duration of performance assessment[2]	Determination of module grade	Comment
9999	PLP graded	100	

Requirements for admission to the module examination

All compulsory modules of the degree program

Further feedback during the course of study

Comments: In the Clinical Optometry specialization, the topic of the bachelor's thesis must come from the field of optometry, refraction, or contact lenses. The examination board decides on exceptions to this rule.

Last update: November 27, 2022, Prof. Dr. U. Paffrath
December 7, 2022, Prof. Dr. J. Nolting

1 *V Lecture L Laboratory S Seminar PR Internship EX Experiment X Not fixed*
E Excursion Ü Practical P Project K Colloquium EL E-learning
Bachelor's degree from SPO 33 (§ 63); Master's degree from SPO 32

2 *PLK Written exams PLR Presentation PLL Laboratory work PLT Learning diary*
PLS Term paper/research report PLE Draft PLF Portfolio PMC Multiple choice
PLM Oral examination PLP Project PPR Internship PLC Multimedia-based exam
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Bachelor's degree from SPO 33 (§ 20); Master's degree from SPO 32