



# **Manual**

## **Module descriptions for the Master of Science (M.Sc.) Vision Science and Business (Optometry)**

**Study and Examination Regulations SPO 30  
Studien- und Prüfungsordnung SPO 30**

**valid since study year 2014/15  
gültig seit Studienjahr 2014/15**

Last and so far only update since accreditation: July 3, 2018

## Study and Examination Regulations

### Master of Science (M.Sc.) Vision Science and Business (Optometry)

- (1) The „Master of Science (M.Sc.) Vision Science and Business (Optometry)“ is a part time degree program that allows one to continue full time practice. The didactic courses and laboratories are designed to take place over 4 terms (approximately 2 years).
- (2) Successful completion of the program requires a minimum of 300 credit points including the preceding Bachelor's degree.
- (3) Admission to the Master of Science Master of Science (M.Sc.) Vision Science and Business (Optometry) is processed in a separate admission statute.
- (4) The study fees for the Master of Science (M.Sc.) Vision Science and Business (Optometry) is processed in a separate fee schedule.
- (5) In the following table there are details on duration and structure of the degree program.
- (6) The weighting of the grades of the modules is geared to the credit points of the module.
- (7) If a Bachelor degree of 180 credit points has been achieved, at minimum 80 credit points have to be earned in the elective modules.  
If a Bachelor degree of 210 credit points has been achieved, at minimum 50 credit points have to be earned in the elective modules.

### Master of Science (M.Sc.) Vision Science and Business (Optometry)

#### Compulsory modules

Nr.	Modul Lehrveranstaltung	Art	Studiensemester SWS				CP
			1	2	3	4	
<b>29010</b>	<b>Ophthalmic Project</b>						<b>5</b>
29110	Ophthalmic Project	V,P	1				5
29123	Ophthalmic Project Presentation	P	X				
<b>29011</b>	<b>Leadership</b>						<b>5</b>
29210	Studium Generale	V,P		2			5
29225	Leadership and Communication	V,P		1			
<b>29051</b>	<b>Master Thesis</b>						<b>30</b>
29251	Master Thesis	P				x	30
29351	Master Thesis Presentation	P				x	

### Elective modules

Nr.	Modul Lehrveranstaltung	Art	Studiensemester SWS				CP
			1	2	3	4	
<b>29012</b>	<b>Human Biology</b>						<b>5</b>
29111	Ocular Anatomy	V	2				5
29112	Physiology	V	2				
<b>29013</b>	<b>Pathology</b>						<b>5</b>
29113	Histology	V,L	2				5
29114	Systems Pathology	V	2				
<b>29014</b>	<b>Pharmacology</b>						<b>5</b>
29115	General Pharmacology	V	2				5
29116	Ocular Pharmacology	V	2				
<b>29015</b>	<b>Ocular Disease</b>						<b>10</b>
29117	Intro to Ocular Disease 1	V,L	3				10
29118	Intro to Ocular Disease 2	V,L		4			
<b>29016</b>	<b>Clinical Optometry</b>						<b>5</b>
29119	Intro to Ocular Disease 3	V,L		1			5
29120	Clinical Optometry Boston USA	V,P		1			
<b>29017</b>	<b>Research Project</b>						<b>20</b>
29211	Research Project	P	x	x			20
29212	Research Project Presentation	P		x			
<b>29018</b>	<b>Vision Therapy and Binocular Vision</b>						<b>10</b>
29213	Binocular Vision Disorders	V,L		2	2		10
29214	Vision Therapy	V,L			4		
<b>29019</b>	<b>Pediatric Optometry</b>						<b>5</b>
29215	Pediatric Optometry	V,L			2		5
29318	Case Management Pediatric	V,P			2		
<b>29020</b>	<b>Sports Vision</b>						<b>5</b>
29216	Sports Vision	V,L				1	5
29217	Sports Vision Field Study USA	V,P				1	
<b>29021</b>	<b>Low Vision</b>						<b>5</b>
29218	Low Vision	V,L		3			5
29310	Low Vision Project	P		x			
<b>29022</b>	<b>Optical Fabrication Technology</b>						<b>10</b>
29219	Project Management and Innovation	V,P			2		10
29311	Surface Processing and Coating Technology	V,L				2	

<b>29023</b>	<b>Contact Lenses</b>						<b>5</b>
29220	Contact Lenses	V,L		2			5
29312	Contact Lenses Project	P		x			
<b>29024</b>	<b>Workplace Design</b>						<b>5</b>
29221	Vision, Light and Ergonomics	V,L		2			5
29313	Workplace Design Project	P		X			
<b>29025</b>	<b>Audio and Vision</b>						<b>5</b>
29314	Audio and Vision	V,L		2			5
29319	Audio and Vision Project	V,L		1			
<b>29026</b>	<b>Eye Glass Design</b>						<b>5</b>
29315	Eye Glass Design	V,L		2			5
29320	Eye Glass Design Project	V,L		2			
<b>29027</b>	<b>Marketing Management</b>						<b>5</b>
29121	Marketing	V,L				2	5
29122	Marketing Project	V,P				1	
<b>29028</b>	<b>Business Simulation</b>						<b>5</b>
29222	Business Strategy	V,P		2			5
29223	Business Simulation Project	V,P			2		
<b>29029</b>	<b>Business Management</b>						<b>5</b>
29224	Value Based Management	V,L			2		5
29317	Business Plan	V,P			2		
<b>29030</b>	<b>Clinical Project Study</b>						<b>5</b>
29321	Clinical Project	V,L			1		5
29322	Clinical Project Presentation	P			x		
<b>29031</b>	<b>Clinical Case Studies: Logbook</b>						<b>5</b>
29323	Clinical Experience	V,L				1	5
29324	Case Documentation	P				x	

**Type of course**

V: Vorlesung (course lecture)


L: Labor (lab course)

P: Projekt (project work)

1 CP (Credit Point) = 30 hours 60. min. each of study

1 semester hour per week =15 hours 45 min. each of lecture

# Compulsory modules

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. h.c. Dietmar Kümmel	

<b>Module name</b>		<b>Ophthalmic Project</b>				<b>Module no. 29010</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	1	150	15	135	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	1	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Compulsory module		1 <sup>st</sup>	-	
<b>Form of studies</b>			<input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29110	Ophthalmic Project	All members of the faculty	Tutorial	1	4	1	Project presentation 20 minutes graded
	<b>Course type</b>	<b>Year of study</b>					
	Compulsory course	1 <sup>st</sup>	-				
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	
29123	Ophthalmic Project Presentation	All members of the faculty	Tutorial	-	1	1	
	<b>Course type</b>	<b>Year of study</b>					
	Compulsory course	1 <sup>st</sup>	-				
<b>Permitted aids</b>							

**Learning goals/competence**

**Professional competence**  
 The students will be able to analyze and structure problems in the ophthalmic field and design a solution based on scientific research techniques. They will be able to arrange and explain their findings in the context of evidence-based optometry.

**Methodological competence**  
 The students will develop the capacity for applying the knowledge in practice. After completion of the module, the students can also evaluate the strengths and weaknesses of their own project. They will be able to formulate the results in a presentation.

**Interdisciplinary general competence**  
 The students will demonstrate the ability to identify a viable problem in the ophthalmic field and present a discussion on the relevance to primary eye care and vision science. They will be able to design a plausible solution for the identified problem using scientific techniques and carry out validation procedures to establish the effectiveness of the proposed solution. The students will be able to summarize their findings.

Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>


**Lecture contents**

Manufacturing (lecture number 29110) and presenting (lecture number 29123) an ophthalmic project in a scientific research field

Basics of scientific research

- quantitative and qualitative methodological of empirical social sciences
- research design

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other _____
<b>Literature</b>	Dependent on the Ophthalmic Project  Literature for scientific research, e.g. <ul style="list-style-type: none"> <li>- Thuls, G. (2016): Wissenschaftliche Arbeiten schreiben mit Word 2016. mitp-Verlag. Frechen.</li> <li>- Becker, F. (2012): Zitat und Manuskript. Erfolgreich recherchieren. Richtig zitieren. Formal korrekt gestalten. Stuttgart. Online im Internet: <a href="http://www.schaeffer-poeschel.de/download/zitat/zitat_und_manuskript.pdf">http://www.schaeffer-poeschel.de/download/zitat/zitat_und_manuskript.pdf</a> [02.05.2014]</li> </ul>
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Leadership</b>				<b>Module no. 29011</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	3	150	45	105	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	2	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Compulsory module		1 <sup>st</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input checked="" type="checkbox"/> Seminar <input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Project work <input type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures								
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading	
29210	Studium Generale	Prof. Dr. Anna Nagl/ Adjunct Faculty	Lectures Project	2	3	2	Oral examination 30 minutes  graded	
	<b>Course type</b>	<b>Year of study</b>						
	Compulsory course	1 <sup>st</sup>	-					
<b>Course no.</b>	<b>Title of the course/lecture</b>	<b>Lecturer</b>	<b>Type</b>	<b>Semester hours per week</b>	<b>CP</b>	<b>Se- mester</b>		
29225	Leadership and Communication	Prof. Dr. Anna Nagl/ Adjunct Faculty	Lectures Project	1	2	2		
	<b>Course type</b>	<b>Year of study</b>						
	Compulsory course	1 <sup>st</sup>	-					
<b>Permitted aids</b>								



**Learning goals/competence**

**Professional competence**  
 The students will understand communication as a planned process of interactions. They will be able to guide employees and customers. They will transfer skills in the management of all stakeholders. They can ascertain their own strengths and weaknesses.

**Methodological competence**  
 The students will enhance their knowledge of methods of controlling negotiations. They will be able to devise the best methods of communication. They will further devise strategies for conflict management. They will propose methods for setting objectives and gathering feedback.

The students will be able to prepare and evaluate scientific material and subsequently summarize it. The students will be able to explain the scientific matter and validate it.

**Interdisciplinary general competence**  
 The students will develop abilities specifically relating to negotiations or the conducting of negotiations. The students will be able to identify their strengths and weaknesses and potential through the personal assessment center and the feedback on that. The students will be able to combine knowledge from anthropology, psychology, communication studies and statistics.

Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Lecture contents**


Studium Generale  
 A combination of humanities such as anthropology, psychology, communication studies and scientific research. The students also learn about developing a research hypothesis and how to design an experiment to test this hypothesis. Students also learn how to analyse research data, write a scientific abstract as well as how to make a scientific presentation.

- Leadership
- Managerial role and tasks
  - Tools for human resource development
  - Specific leadership scenarios: performance evaluation; feedback; setting objectives
  - Motivation in the business context
  - Conflict management

- Communication
- Essentials in planning of communication regarding negotiations
  - Conversational management in negotiations
  - Strategies and methodological of controlling communication and negotiations
  - Exercising sales talk at an optometry practice

<b>Language</b>	<input checked="" type="checkbox"/> German	<input checked="" type="checkbox"/> English	<input type="checkbox"/> Spanish	<input type="checkbox"/> French
	<input type="checkbox"/> Chinese	<input type="checkbox"/> Portuguese	<input type="checkbox"/> Russian	<input type="checkbox"/> Other _____
<b>Literature</b>	Script Distance learning platform moodle			

<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	June 16, 2015

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Master Thesis</b>				<b>Module no. 29051</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
30	-	900	-	900	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	4	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Compulsory module		2 <sup>nd</sup>	-	
<b>Form of studies</b>			<input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							


Courses/lectures								
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading	
29251	Master Thesis	All members of the faculty	Tutorial	-	27	4	Master thesis and its presentation  20 minutes graded	
	<b>Course type</b>	<b>Year of study</b>						
	Compulsory course	2 <sup>nd</sup>	-					
<b>Course no.</b>	<b>Title of the course/lecture</b>	<b>Lecturer</b>	<b>Type</b>	<b>Semester hours per week</b>	<b>CP</b>	<b>Se- mester</b>		
29351	Master Thesis Presentation	All members of the faculty	Tutorial	-	3	4		
	<b>Course type</b>	<b>Year of study</b>						
	Compulsory course	2 <sup>nd</sup>	-					
<b>Permitted aids</b>								

<b>Learning goals/competence</b>			
<p><b>Professional competence</b> The students will demonstrate the ability to conduct an in-depth literature review to support a research hypothesis. They will be able to develop a discussion that leads to the statement of a well-defined research question and hypothesis. They will be able to design the appropriate methodology for data collection as a means of testing the research hypothesis. They will be able to summarize research results with proper statistical methodology and discuss inferences gained from the research.</p> <p><b>Methodological competence</b> The students will develop entry level research design such as designing the proper methodology for data collection as a means of testing the research hypothesis, data analysis skills such as reporting and summarizing the research results with proper statistical methods, and a deeper appreciation for scientific literature through extensive library research.</p>			
Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Lecture contents</b>
Autonomous elaboration of a complex scientific issue, a final presentation of the Master Thesis is given by the student to all members of the degree program and also to all interested e.g. alumni

<b>Language</b>	<input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Dependent on the Master Thesis  Literature for scientific research published on the distance learning platform moodle, e.g. <ul style="list-style-type: none"> <li>• Thuls, G. (2016): Wissenschaftliche Arbeiten schreiben mit Word 2016. mitp-Verlag. Frechen. .</li> <li>• Becker, F. (2012): Zitat und Manuskript. Erfolgreich recherchieren. Richtig zitieren. Formal korrekt gestalten. Stuttgart. Online im Internet: <a href="http://www.schaeffer-poeschel.de/download/zitat/zitat_und_manuskript.pdf">http://www.schaeffer-poeschel.de/download/zitat/zitat_und_manuskript.pdf</a> [02.05.2014]</li> </ul>
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	July 3, 2018

## **Elective modules**

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Human Biology</b>				<b>Module no. 29012</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	4	150	60	90	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	1	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		1 <sup>st</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures									
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading		
29111	Ocular Anatomy	Kathleen L. Krenzer, O. D. Ph.D., D.A.T., Adjunct Assistant Professor at New England College of Optometry (NECO)	Lecture Blended Learning	2	3	1	Written test 120 minutes graded		
	<b>Course type</b>							<b>Year of study</b>	
	Elective course							1 <sup>st</sup>	-
29112	Physiology	Adjunct Faculty	Lecture	2	2	1			
	<b>Course type</b>							<b>Year of study</b>	
	Elective course							1 <sup>st</sup>	-
<b>Permitted aids</b>									
<b>Learning goals/competence</b>									

**Professional competence**

The students will be able to describe and understand ocular structures, orbit and embryological development of the eye in depth. The students will demonstrate the knowledge of the blood supply, nervous innervations and muscles of the ocular structures and adnexa in relation to the ocular structures. The students will be able to describe and relate the physiology in regards to control mechanisms manifestations including homeostasis, blood and circulation, endocrine system and hormonal function. They will demonstrate in-depth knowledge regarding the maintenance of the human body specifically in the areas of cardiovascular system, respiratory system, renal physiology and the endocrine systems.

**Methodological competence**

The students will know specific examples of how the ocular anatomy is related to normal function, how it is involved in the presentation and subsequent treatment of ocular conditions. The students will understand and apply the basics to clinical related problems that involve pathological processes and disease.

The students will have in-depth knowledge and understanding of the basic organization of the human body, control systems, maintenance, support and movement and relate these to the anatomical structure of each area. They will be able to correlate physiology of systems that are closely linked with the functioning of the eye.

Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Lecture contents**

Ocular Anatomy

- Ocular adnexa: eyebrows, superior palpebral sulcus inferior folds, canthi, lid margin, lacrimal system, blood supply and innervation of ocular adnexa
- Ocular surface: cornea, conjunctiva, sclera
- Anterior uvea: iris, anterior chamber angle, ciliary body, blood supply of iris and ciliary body
- Lens and vitreous
- Choroid and retina
- Optic nerve: gross landmark, cross section, visual pathway
- Embryology of the eye: development of the eye, clinical correlations
- The orbit: bones of orbit, extraocular muscles, nerves of orbit, cranial nerves not related to eye movement, nerves of orbit related to ocular movement, apex of orbit: orbital passages, muscle cone


Physiology

- Homeostasis: definition and body control system
- Blood and circulation: physical characteristics, composition, diagnostic tests
- Cardiovascular system: physiological properties of cardiac muscle, specialized tissue, extrinsic and intrinsic control of the heart, cardiac arrhythmias, electrocardiogram and its interpretation, heart as a pump, coronary circulation, hypertension, angina pectoris, myocardial infarction, and congestive heart failure
- Renal physiology: capillary dynamics and exchange of fluid between the blood and interstitial fluid, formation of urine by the kidney, glomerular filtration, tubular function, and plasma clearance, regulation of body fluids by kidney
- Respiratory system: pulmonary anatomy, mechanisms of ventilation and breathing, pulmonary circulation, blood transport and tissue gas exchange, ventilation/perfusion relationship, central mechanism of respiratory control, acid base regulation, chemical control of breathing
- Endocrine systems: chemical nature, response, transport and mechanism of hormones and action; feedback regulation and hormonal control, pituitary gland, thyroid gland, adrenal glands: biosynthesis and transport of thyroid hormones, physiological functions, and control mechanisms, pathologic conditions involving the thyroid gland, and treatment, gastro-intestinal hormones: gastrin, cholecystokinin, secretion and gastric inhibitory peptide, endocrine pancreas

- Insulin and glucagon as it relates to diabetes mellitus

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	<p>Script Distance learning platform moodle</p> <p>Ocular Anatomy: - Gayton, A. (1984): Physiology of the Human Body. - Tortora, G./ Grabowski, S. (2005): Principles of Anatomy and Physiology. 11<sup>th</sup> Edition. Wiley &amp; Sons.</p> <p>Physiology: - Sherwood, L. (2008): Human Physiology: From cells to systems. 6<sup>th</sup> Edition. Thompson-Brooks/Cole. - Snell, R. S., Lemp, M (1998): Clinical Anatomy of the Eye.</p>
<b>Composition of the final mark</b>	Final grade consists of a combined module examination
<b>Comments/other</b>	
<b>Last updated</b>	June 16, 2015



	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Pathology</b>				<b>Module no. 29013</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	4	150	60	90	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	1	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		1 <sup>st</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29113	Histology	Debora L. Nickla, M.S., Ph.D., Professor at New England College of Optometry (NECO)	Lecture Lab Blended Learning	2	2	1	Lab work (20%) and written test (80%)  120 minutes graded
	<b>Course type</b>		<b>Year of study</b>				
	Elective course		1 <sup>st</sup>		-		
29114	Systems Pathology	Kathleen L. Krenzer, O. D. Ph.D., D.A.T., Adjunct Assistant Professor at New England College of Optometry (NECO)	Lecture Blended Learning	2	3	1	120 minutes graded
	<b>Course type</b>		<b>Year of study</b>				
	Elective course		1 <sup>st</sup>		-		

<b>Permitted aids</b>	
-----------------------	--

<b><u>Learning goals/competence</u></b>
---

**Professional competence**

The students will be able to demonstrate the knowledge of the fundamentals of histology and its relation to the eye. They know the functions of all cells, and how specific organelles support these functions; and how structure supports function. The students will understand the basic organization of cells within tissues, organs, and organ systems and understand the functional significance.

The students will be able to describe the pathological changes; how the pathology relates to the clinical presentation and understanding the difference between the biological and clinical goals of therapy. They will be able to demonstrate knowledge and in understanding of the fundamentals of the types of pathological processes that underlie the clinical manifestation of disease.

**Methodological competence**

The students will be able to distinguish between these classes based on cell morphology including the four classes of specialized cells that make up organs: epithelial tissue, connective tissue, nerve and muscle. The students will be able to relate to other biological science curriculum on completion of this course.

The students will understand the pathological processes involved in a disease in understanding the biological constructs that underlie the clinical presentation, the clinical course and the rationale for therapeutic intervention. The students will understand how the pathological processes play roles in a select group of systemic disorders that are prevalent among those likely to seek care from an optometrist.

Competence area	concentration	minor concentration	in small amounts
<b>Professional competence</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Methodological competence</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Interdisciplinary general competence</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Lecture contents</b>
-------------------------

Histology

- Cell organelles and function
- Histological techniques
- Review: Epithelium/ocular epithelium

Lab 1: Ocular epithelium, connective tissue, integument, cartilage and bone

Lab 2: Connective tissue, blood and muscle tissues

Lab 3: Integument/eyelid, nervous system, exocrine and endocrine systems

Lab 4: Blood, muscle; systems histology: cardiovascular, renal, respiratory and digestive systems

Lab 5: Nervous system, cardiovascular system

General Pathology


- Pathology and Pathophysiology: cell Injury and adaptation and cell death
- Tissue responses to damage types of inflammation
- Immunology
- Neoplastic processes
- Metabolic disorders

Systems Pathology

- Cardiovascular dysfunction and primary essential hypertension
- Human deficiency virus: HIV and AIDS

- Respiratory systems
- Diabetes mellitus
- Inflammatory conditions and dermatological lesions

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Script Distance learning platform moodle Histology: -Wheater, P, Young, B. et al (2006): Wheater's Functional Histology. 5 <sup>th</sup> edition. Churchill Livingstone. Systems Pathology: - Kumar, V./ Cotran, R./Robbins, S. (2002): Robbins Basic Pathology. 7 <sup>th</sup> edition. Saunders.
<b>Composition of the final mark</b>	Final grade consists of a combined modules examination.
<b>Comments/other</b>	Minimum 10 students
<b>Last updated</b>	June 16, 2015

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Pharmacology</b>				<b>Module no. 29014</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	4	150	60	90	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	1	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		1 <sup>st</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures								
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading	
29115	General Pharmacology	Brandon Zimmerman, DEC, B. Sc., Ph.D., Adjunct Assistant Professor at The New England College of Optometry (NECO)	Lecture	2	3	1	Written test 120 minutes graded	
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	1 <sup>st</sup>	-					
29116	Ocular Pharmacology	Diane T. Adamczyk, B. S., O.D., Professor of Optometry at SUNY	Lecture Blended Learning	2	2	1	Written test 120 minutes graded	
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	1 <sup>st</sup>	-					
<b>Permitted aids</b>								

## Learning goals/competence

### **Professional competence**

The students will be able to provide detailed explanations of the application of the principles in pharmacology, biological factors influencing drug response, pharmacokinetics and drug delivery systems, includes the clinical properties of widely systemic drugs and interactions and ocular and visual side effects of systemic medications in clinical use. The students will be able to understand properties, clinical attributes and practical applications of pharmaceutical agents used in ophthalmic diagnosis and therapy. The students will be able correlate the pharmacology with related medical science, the action and uses of drugs in advances in medicine. The students will understand and demonstrate knowledge on applications of pharmaco-dynamics to therapeutics and to correlate these principles to the ocular system. They also will be able to understand the application and use of therapeutics in systemic and ocular application in a clinical setting. The students will know the basic principles of ophthalmic pharmacology and clinical application of drugs used in the diagnosis and treatment of ocular disease and ocular manifestations of systemic disease with special attention to practical matters including contraindications, precautions, dosage, administration, side effects and drug interactions. They will know the legal considerations related to use and prescription of ocular pharmaceuticals

### **Methodological competence**

The students will be able to correlate pharmacology with related medical science, the action and uses of drugs in advances in medicine. The students will be able to place the emphasis on applications of pharmaco-dynamics to therapeutics and to correlate these principles to the ocular system. The students will understand the use of therapeutics in systemic and ocular application. The students will be able to understand and demonstrate knowledge on applications of pharmaco-dynamics to therapeutics and to correlate these principles to the ocular system.

Competence area	concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## **Lecture contents**

### *Principles of general pharmacology*

- General principles in pharmacology
- Routes of drug administration
- Pharmacokinetics of drug
- Half life of drug: protein binding
- Concentration of unbound drug
- Bio-Transformation or metabolism
- Excretion of drugs

### *General aspects of neuropharmacology: autonomic nervous system drugs*

- Anatomical subdivision of the autonomic nervous system
- Central nervous system
- Autonomic system
- Neuro-humoral transmission in the autonomic system
- Mechanisms for signal termination, cholinergic system
- Mechanisms for signal termination, adrenergic system

### *General Pharmacological drugs and their applications*

- Cardiovascular drugs, histamine and antihistamine, systemic glucocorticoids, sedative hypnotic and anti-epileptic drugs, analgesics, antipyretics, and anti-inflammatory drug: non narcotic and narcotic analgesics, anti-depressants and anti-psychotics, amphetamines and sympathomimetics

*Principles of Ocular Pharmacology*

- Survey of current optometric drug uses
- Preparation and packaging of ophthalmic drugs
- Drug actions, drug effectiveness, drug safety
- The medical prescriptions
- Factors influencing the objectively demonstrated patient response
- Review of general drug transport mechanisms
- Ocular penetration
- Routes of ocular administration


*Optometric diagnostic drugs and their applications*

- Clinical usage, special hazards/precautions in ophthalmic drug use, surface active drugs, topical anesthetics, autonomic drugs, actions and effect, physical agents, over the counter ophthalmic products, dyes, stains and their uses

*Survey of ophthalmic drug usage. Mechanisms of how the drugs work, effectivity, side effects*

- Glaucoma drugs, sulfonamides, antibiotics, anti-viral agents, anti-fungal agents, corticosteroids, others

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Script Distance learning platform moodle General Pharmacology: - Katzung, G. (2006): Basic and Clinical Pharmacology. 10 <sup>th</sup> edition. Appleton and Lange. Ocular Pharmacology: - Bartlett, S./Bartlett, J./Jaanus, S. (2000): Clinical Ocular Pharmacology.4 <sup>th</sup> edition. Butterworth and Heinemann.
<b>Composition of the final mark</b>	Final grade consists of a combined modules examination
<b>Comments/other</b>	Minimum 10 students
<b>Last updated</b>	June 16, 2015

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Ocular Disease</b>				<b>Module no. 29015</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
10	7	300	105	195	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	1 2	<input type="checkbox"/> 1 semester <input checked="" type="checkbox"/> 2 semesters
<b>Target degree</b>		<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>		
Master of Science (M.Sc.)		Elective module		1 <sup>st</sup>	-		
<b>Form of studies</b>		<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report					
<b>Admission requirement</b>							

Courses/lectures								
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading	
29117	Intro to Ocular Disease 1	Bina Patel, O.D., Professor at New England College of Optometry (NECO)  Georg Scheuerer, Thomas Hofmann, Oliver Buck, all M.Sc.	Lecture Lab Blended Learning	3	5	1	Lab work (practical proficiency) and written test  120 minutes graded	
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	1 <sup>st</sup>	-					
<b>Course no.</b>	<b>Title of the course/lecture</b>	<b>Lecturer</b>	<b>Type</b>	<b>Semester hours per week</b>	<b>CP</b>	<b>Se- mester</b>		
29118	Intro to Ocular Disease 2	Bina Patel, O.D., Professor at New England College of Optometry (NECO),  Tony Cavallerano, O. D., Professor at New England College	Lecture Lab	4	5	2		


		of Optometry (NECO) Jinjong Chung, Laureen Kirkness, Adjunct Faculty New England College of Optometry  Georg Scheuerer, Thomas Hofmann, Oliver Buck, all M.Sc.					
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	1 <sup>st</sup>	-				
<b>Permitted aids</b>		Diagnostic procedure equipment: slit lamp, biomicroscope, tonometer, visual field machines such as frequency doubling perimeter, Humphrey visual fields, Goldmann visual fields, direct ophthalmoscope, penlight, auxiliary diagnostic lenses such as 90D, 78D, 60D, gonioscopy lenses, Optic coherence tomography, fundus camera, blood pressure/stethoscopes					

<u>Learning goals/competence</u>			
<b>Professional competence</b>			
The students will be able to understand normal variations and abnormal findings of the anterior portion of the eye. They will be able to make differential diagnosis on red eye presentations and they will be able to formulate a management and treatment plan. The students will be able to detect and understand the manifestations of dry eye and lacrimal disorders. They will be able to detect and correlate the effects on vision/refractive errors with the manifestation of cataracts and understand the relationship between ocular findings and systemic diseases where applicable. The students will be able to demonstrate proficiency in using a slit lamp biomicroscopy, lacrimal assessment, and demonstrate the knowledge and skills to understand the workings of the optic nerve head and related variations. The students will have in depth understanding of optic nerve damage as it relate to glaucoma, mechanisms involved and diagnostic tools used in diagnosis such as goldmann tonometry, gonioscopy, visual field, direct ophthalmoscope, optical coherence tomography, auxiliary lenses with biomicroscopy use fundus camera. They will know of how the condition is managed and treated including the importance of timely referrals. They will be able to develop proficient diagnostic skills that will be incorporated into a primary eye examination.			
<b>Methodological competence</b>			
The students will demonstrate competency in proficiency with diagnostic skills in techniques such as slit lamp, Goldmann tonometry, gonioscopy, direct ophthalmoscope. They will be able to interpret results from instruments used in aiding with the diagnosis or screening such as optical coherence tomography, fundus camera and visual fields.			
<b>Interdisciplinary general competence</b>			
The students will be able to correlate clinical findings to their knowledge in ocular disease and be able to develop and carry out appropriate management and treatment including involvement of multidisciplinary health care providers. They will be able to apply subjects covering ocular anatomy, histology, physiology, general and ocular pharmacology principles. They will provide the foundation and knowledge to incorporate diagnostic procedures and apply them to patient care.			
Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



<b>Lecture contents</b>	
<p>Lids, lashes, and adnexa: overview, congenital abnormalities, normal variations, inflammatory and infections, malignant and benign lesions of infection of lids.</p> <ul style="list-style-type: none"> <li>- Lacrimal system: overview, dry eye, diagnostic evaluation, abnormal lacrimal tear production, congenital and acquired abnormalities of the lacrimal drainage system.</li> <li>- Conjunctiva: overview, conjunctiva variations, malignant and benign lesions, infections and inflammation of conjunctiva: bacterial, viral, trachoma inclusion organisms, allergic.</li> <li>- Episclera and sclera: overview, etiology, diagnosis, classification, clinical course.</li> <li>- Uvea: overview, classification, clinical presentation, pathogenesis, etiology, diagnostic consideration, management.</li> <li>- Anterior chamber assessment. Gonioscopy: features observed, normal and abnormal features, open versus closed; angles, reasons for gonioscopy, pathological presentations.</li> <li>- Cornea: overview, edema, scarring, neovascularization, examination procedures, corneal degenerations and dystrophies, drug depositions, management and options of treatment.</li> <li>- Lens: overview, lens variations, aging changes, cataracts, clinical evaluation, understanding of surgical treatment.</li> <li>- Optic nerve head: C/D estimation, variations, examination,</li> <li>- Glaucoma: diagnosis, primary open angle glaucoma, secondary open angle glaucomas, narrow angle glaucoma, acute angle closure glaucoma, ocular hypertenision, glaucoma suspect, methods of detection, understanding of treatment and understanding of some of the basic surgical treatment.</li> <li>- Diagnostic labs: slit lamp examination, lacrimal and dry eye evaluation, tonometry, gonioscopy, optic nerve evaluation, optical coherence tomography application: anterior and posterior segment</li> </ul>	

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	<p>Script</p> <p>Distance learning platform moodle</p> <ul style="list-style-type: none"> <li>- Catania, L. (1996): Primary Care of the Anterior Segment. 2<sup>nd</sup> edition.</li> <li>- Casser, L. et al (1997): Atlas of Primary Eye care Procedures. 2<sup>nd</sup> edition. McGraw-Hill Pub.</li> <li>- Alexander, L. (2002): Primary Care of the Posterior Segment. 3<sup>rd</sup> edition. McGraw-Hill Pub.</li> <li>- Kanski, J. (2003): Clinical Ophthalmology: A Systematic Approach.5<sup>th</sup> edition. Butterworth-Heinemann.</li> </ul>
<b>Composition of the final mark</b>	Final grade consists of a combined modules examination
<b>Comments/other</b>	
<b>Last updated</b>	June 16, 2015

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Clinical Optometry</b>				<b>Module no. 29016</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	2	150	30	120	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	2	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		1 <sup>st</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29119	Intro to Ocular Disease 3	Prof. Patel, Caruso, O.D., et al.	Lecture Labs Blended Learning	1	2	2	Lab work and written test  60 minutes  graded
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	1 <sup>st</sup>		-			
<b>Course no.</b>	<b>Title of the course/lecture</b>	<b>Lecturer</b>	<b>Type</b>	<b>Semester hours per week</b>	<b>CP</b>	<b>Se- mester</b>	
29120	Clinical Optometry Boston USA	Prof. Patel, Caruso, O.D., et al.	Lectures Clinical & surgical observation	1	3	2	
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	1 <sup>st</sup>		-			
<b>Permitted aids</b>							

## Learning goals/competence

### **Professional competence**

The students will have knowledge and skills in understanding normal variations and abnormal findings of the posterior portion of the eye. They will be able to detect and understand the manifestations of common uveal diseases macular disease, vitreal variations and disorders, pigmented lesions in the retina and choroid, peripheral retinal variations and diseases including the pathophysiological process and optic nerve inflammatory conditions. The students will be able to detect and correlate the effects on vision/refractive errors with the manifestation of macula diseases and other optic nerve inflammatory diseases. They will understand the relationship between ocular findings related to common systemic diseases. They will understand the ocular vascular manifestations such as diabetes, hypertension, etc., and normal and abnormal pupillary responses and findings and as they correlate to the parasympathetic and sympathetic nervous system, management and underlying causes. The students will demonstrate the knowledge to understand of benign peripheral retinal degenerations, formation of retinal holes, tears and detachments, understanding of management and treatment options. The students will know normal variations and abnormal pigmented related lesions of the retina and choroid. They will understand and interpretate of fluorescein angiography and optical coherence tomography and how it relates to common vascular, macula, vitreal disorders. The students gained proficiency in using instruments to diagnose posterior segment disorders such as fundus camera, optical coherence tomography, auxiliary lenses with biomicroscopy, binocular indirect ophthalmoscope, blood pressure measurement, pupil measurements. They know how the condition is managed and treated including the importance of timely referrals. They develop proficient diagnostic skills that will be incorporated into a primary eye examination

The students will be able to develop a more in depth understanding of the application of optical coherence tomography and its relation to optic nerve and macula disorders. They develop a deeper understanding of how primary care practice is incorporate in patient care in the US and demonstrate entry-level competency in punctal plug and foreign body removal. They understand evidence based medicine and related topics related to ocular pathology, binocular abnormalities.

### **Methodological competence**

The students will demonstrate competency in proficiency with diagnostic skills in techniques such as binocular indirect ophthalmoscope, auxiliary lens use with biomicroscopy, They will have working knowledge and ability to interpret results from instruments used in aiding with the diagnosis or screening such as optical coherence tomography, fundus photography, fluorescein angiography.

### **Interdisciplinary general competence**

The students will be able to correlate clinical findings to their knowledge in ocular disease. They will be able to develop and carry out appropriate management and treatment including involvement of multidisciplinary health care providers. They will be able to apply subjects covering ocular anatomy, histology, physiology, systems pathology general and ocular pharmacology principles. The students will provide the foundation and knowledge to incorporate diagnostic procedures and apply this to patient care. They will be able to work in efforts to reduced incidence of visual blindness as a public health effort as related to common manifestations of systemic diseases such as diabetes.

The students will have a deeper understanding of how optometrist are providing a primary care role to eye care. They will be able to recognize, understand and manage anterior and posterior segment ocular emergencies. The students will know how the profession optometry interacts and supports other professional disciplines including ophthalmology. They will understand the Optometry's importance and contribution in prevention of blindness and role in public health related profession.

Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Lecture contents**

- Fundus examination: comparison of instruments, diagnostic techniques
- Pupils: pupillary reaction, normal and abnormal, afferent pupillary APD defects, cause of abnormal shape
  - Congenital optic nerve abnormalities: common disorders, prognosis, short and long term complications, application to visual fields
  - Acquired optic nerve abnormalities: optic nerve swelling, typical findings, diagnostic techniques, visual fields, management
  - Differential diagnosis of retinal and choroidal lesions: vitreal attachment, hemorrhages, pigmented lesions, exudates, drusen, vascular changes
  - Fluorescein angiography: procedure, reasons, side effects, interpretation normal/abnormal,
  - Macula: overview, examination techniques, complications to layers, age related macula degeneration, CNV formation and causes, NEI clinical findings and application, idiopathic central serous choroidopathy, epiretinal membrane, macula holes, cystoid macula edema,
  - Vitreous: overview, common variations, asteroid hyalosis, post, vitreous detachment, management
  - Retinal vascular occlusive disease: retinal vascular pathiophysiology, clinical presentation, complications and management of CRAO, BRAO, CRVO, BRVO
  - Hypertensive retinopathy: review, findings and staging, management, blood pressure
  - Diabetic retinopathy: review of systemic diabetes, risk factors, pathiophysiology of retinopathy, ETDRS - classification system, management protocols, application of studies
  - Peripheral retina: overview, common age related variations, retinal holes, tears, detachment
  - Posterior segment inflammations: Understand the manifestation of the process systemically and clinical manifestation, toxoplasmosis, toxocara, histoplasmosis
  - Diagnostic laboratory: auxiliary lenses with slit lamp, Goldmann 3 mirror, binocular indirect ophthalmoscopy, optical coherence tomography, Goldmann 3 mirror, pupillary testing

Interactive lecture presentations

- Anterior segment ocular disease grand rounds
- Posterior segment ocular disease grand rounds
- Emergency anterior and posterior segment ocular presentations
- Research on myopia and clinical application
- Evidence based medicine cases related to refractive errors
- Retinal update and research


Workshop and interactive discussion and presentations

- Diabetic retinopathy
- Visual field and fundus findings
- Glaucoma cases
- Optical coherence tomography interpretation and use of the technique with interesting cases
- Foreign body removal overview and workshop
- Punctual plugs overview and workshop

Clinical observation

Clinical observation at community health centers, veteran's hospital, or secondary referral centers

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Script Distance learning platform moodle See also module Ocular Disease
<b>Composition of the final mark</b>	Final grade consists of a combined modules examination
<b>Comments/other</b>	Clinical Optometry: Module includes two weeks of expert presenters at New England College of Optometry, Boston, MA, US
<b>Last updated</b>	June 16, 2015

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Research Project</b>				<b>Module no. 29017</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
20	-	600	-	600	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	1 2	<input type="checkbox"/> 1 semester <input checked="" type="checkbox"/> 2 semesters
<b>Target degree</b>		<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>		
Master of Science (M.Sc.)		Elective module		1 <sup>st</sup>	-		
<b>Form of studies</b>		<input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report					
<b>Admission requirement</b>							

Courses/lectures								
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading	
29211	Research Project	Prof. Dr. Anna Nagl/ Adjunct Faculty	Project	-	17	1 + 2	Paper, presentation and its discussion  20 minutes  graded	
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	1 <sup>st</sup>	-					
29212	Research Project Presentation	Prof. Dr. Anna Nagl/ Adjunct Faculty	Project presentation	-	3	2		
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	1 <sup>st</sup>	-					
<b>Permitted aids</b>								

**Learning goals/competence**

**Professional competence**  
 The students develop advanced skills in independent research in the field of optometry utilizing scientific methods including project and time management skills. They will be able design, plan and organize a research project. The students will also gain further practice in scientific and professional writing.


**Methodological competence**  
 The students will be able to prepare and evaluate scientific material and subsequently summarize it. The students will demonstrate the ability to develop a 'statement of the problem' and frame the research question (hypothesis) as well as analyze and interpret the research results using appropriate methodological statistics. The students will be able to analyze and interpret the results/outcomes and summarize, conclude and draw inferences obtained from the research. The students will be able to prepare and structure a research paper and publish it.

Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Lecture contents**

- Preparing a research paper in a scientific research field in theory and practice: applied sciences
- Presentation of the research work
- Discussion over the methodology and the results of the research project and the presentation

<b>Language</b>	<input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Depends on the subject of the research project
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Vision Therapy and Binocular Vision</b>				<b>Module no. 29018</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se-semester</b>	<b>Duration</b>
10	8	300	120	180	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	2	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		2 <sup>nd</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se-semester	Module exam: type/length/grading
29213	Binocular Vision Disorders	Scott Cooper, B.S., O.D., MEd, FAAO, Karl Citek, B.S., O.D., MEd, FAAO both Professors at the College of Optometry at the Pacific University	Lecture Blended Learning Labs	4	5	2	Lab work and written test  120 minutes graded
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	1 <sup>st</sup>	-				
29214	Vision Therapy	Scott Cooper, B.S., O.D., MEd, FAAO, Graham Erickson, B.S., O.D., FAAO, FCOVD both Professors at the College of Optometry at the Pacific University	Lecture Labs	4	5	3	
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	2 <sup>nd</sup>	-				
<b>Permitted aids</b>							

**Learning goals/competence**

**Professional competence**

The students will understand how binocular vision disorders impact the daily lives of the public. They will understand the neurophysiology of accommodation, vergence and eye movements and have detailed understanding of functional aspects of accommodation, vergence and eye movements. The students know and apply psychophysical measurement principles to evaluation of visuomotor skills. They will be able to identify visuomotor anomalies and prioritize relative to clinical care. They will be able to apply various methods of analysis to evaluate individual measurements of specific functions and indirect clues to related functions. The students will be able to identify specific visual syndromes based on formal analysis. They will be able to prioritize treatment options and apply logically derived prescriptions whenever applicable based on a formally derived diagnosis.

**Methodological competence**

The students will integrate presented material within current practice setting, whenever applicable. They will be able to interpret and utilize horizontal fixation disparity curves in diagnosis and treatment. The students will understand and apply bioengineering model of accommodation and vergence to vision therapy. They will understand, organize and prepare to apply vision therapy to patients with easily treatable diagnoses. They will understand sensory aspects of vision therapy as they pertain to improvement or resistance to improvement. The students will be familiar with the benefits and limitations of computer-based vision therapy. They will be able to identify which patients with vertical deviations should be treated with prism and which should receive vision therapy. They will be able to provide vision therapy for vertical deviations and understand the principles of diagnosis and treatment of strabismus. They will be familiar with specialized areas of vision therapy and understand how to incorporate vision therapy into daily practice: office and patient management

**Interdisciplinary competence**

The students will acquire mastery of the knowledge on a level where the student can educate the public within their scope of practice.

Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Lecture contents**

*Binocular Vision Disorders*

- Neurophysiology of vision
- Overview of common non-strabismic visuomotor: binocular vision anomalies
- Basic analysis techniques for visuomotor: binocular vision problems; identification of syndromes
- Methodological of case analysis to consider clinical data as individual measurements of specific functions, as indirect clues to related functions and as information to allow identification of specific syndromes. These analyses lead to discussion of treatment options, prioritization of treatments, and prescriptive calculations.
- Application: case examples


*Vision Therapy*

- Interpretation and utilization of horizontal fixation disparity curves
- Incorporation of vision therapy into daily practice
- Biomechanical model of accommodation and vergence
- Vision Therapy approaches
- Sensory aspects of Vision Therapy
- Computer-based Vision Therapy options



- Vision Therapy for vertical deviations
- Strabismus

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	<p>Script Distance learning platform moodle</p> <ul style="list-style-type: none"> <li>- Griffin/Grisham (1995): Binocular Anomalies; Diagnosis and Vision Therapy. Butterworth-Heinemann.</li> <li>- Scheimann/Wick (1994): Clinical Management of Binocular Vision. Lippincott.</li> <li>- Birnbaum (1993) Optometric management of nearpoint vision disorders. Butterworth-Heinemann.</li> <li>- Ciuffreda/Tannen (1995): Eye Movement Basics for the Clinician. Mosby.</li> <li>- Dictionary of Visual Science</li> </ul>
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	June 16, 2015

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	


<b>Module name</b>		<b>Pediatric Optometry</b>				<b>Module no. 29019</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	4	150	60	90	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	4	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>		<b>Module type</b>		<b>Year of study</b>		<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)		Elective module		2 <sup>nd</sup>		-	
<b>Form of studies</b>		<input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input checked="" type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report					
<b>Admission requirement</b>		Successful completion of module "Vision Therapy and Binocular Vision"					

Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29215	Developmental Milestones in Pediatric Optometry	J. P. Lowery Hannu Laukkanen,  Professors at the College of Optometry at the Pacific University	Lecture Lab	2	3	3	Written test and assigned case work-ups
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	2 <sup>nd</sup>	-				
29318	Case Management in Pediatric Optometry	J. P. Lowery Hannu Laukkanen,  Professors at the College of Optometry at the Pacific University	Lecture Lab	2	2	3	120 minutes graded
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	2 <sup>nd</sup>	-				
<b>Permitted aids</b>							

<b>Learning goals/competence</b>			
<p><b>Professional competence</b> The students will become an entry-level optometrist with the knowledge and skills to understand vision disorders impacting the pediatric population. The students will be able to relate basic knowledge of vision development. They will formulate knowledge and skills in assessment techniques unique to pediatric optometry. The students will be able to ascertain the relationships between vision and learning; and will be able to transfer the skills in optometric case management for the pediatric patient.</p>			
<p><b>Methodological competence</b> The student will be able to transfer methods in assessment techniques for pediatric patients.</p>			
<p><b>Interdisciplinary competence</b> The students will be able to develop the mastery of the knowledge on a level where the student can educate the public within their scope of practice as well as develop communication skills to be able to organize key information from a pediatric patient.</p>			
Competence area	concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<b>Lecture contents</b>
<ul style="list-style-type: none"> <li>- Overview of vision disorders and developmental milestones impacting the pediatric population</li> <li>- Basic examination and assessment of the infant, toddler, pre-school, and school-aged child</li> <li>- Near-point vision analysis and assessment of visual perception</li> <li>- Relationship between vision and learning</li> <li>- Lens prescribing and vision therapy in pediatric optometry</li> </ul> <p>Clinic based assignments</p> <ul style="list-style-type: none"> <li>- Basic examination and assessment of the infant, toddler, pre-school, and school-aged child</li> <li>- Near-point vision analysis and assessment of visual perception</li> <li>- Relationship between vision and learning</li> <li>- Lens prescribing and vision therapy in pediatric optometry</li> </ul>

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Script Distance learning platform moodle - Required text: “Clinical Pediatric Optometry” by Press & Moore Suggested Reading: -Scheiman/Rouse: Optometric Management of Learning-Related Vision Problems -Birnbaum, M.: Optometric Management of Nearpoint Vision Disorders
<b>Composition of the final mark</b>	
<b>Comments/other</b>	Minimum 10 students
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Sports Vision</b>				<b>Module no. 29020</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	2	150	30	120	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	4	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>		<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>		
Master of Science (M.Sc.)		Elective module		2 <sup>nd</sup>	-		
<b>Form of studies</b>		<input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report					
<b>Admission requirement</b>							

Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29216	Sports Vision	Graham Erickson, B.S., O.D., FAAO, FCOVD Professor of Optometry at the College of Optometry at the Pacific University	Lecture Lab	1	2	4	Project graded
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	2 <sup>nd</sup>	-				
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	
29217	Sports Vision Field Study USA	Graham Erickson, B.S., O.D., FAAO, FCOVD Professor of Optometry at the College of Optometry at the Pacific University  Willard Bleything B.S., M.Sc., O.D.,	Lecture Lab	1	3	4	

		F.A.A.O., Distinguished University Professor of Optometry and Public Health at the College of Optometry at the Pacific University					
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	2 <sup>nd</sup>	-				
<b>Permitted aids</b>							

**Learning goals/competence**

**Professional competence**  
The students will be able to determine the pertinent visual skills utilized in sport. They will be able to provide the rationale and research results in support of specific sports vision performance skills including normative data. They will be able to provide strategies for a comprehensive evaluation of athletes to provide a background for protective eyewear issues; and, to learn vision training techniques utilized in visual skills related to athletes.

The students will demonstrate the ability to build sports vision services into an optometric practice. They will be able to determine the visual skills most pertinent in various sports and apply research results in testing for specific sports performance skills. They will be able to organize a comprehensive evaluation for athletes competing in various sports. The students will be able to manage refractive treatment options including filters and eyewear considerations for safety; and, apply vision training to enhance visual skills essential to sports.

**Methodological competence**  
The students will be able to employ strategies to build sports vision into an optometric practice and to provide case management strategies for refractive components, enhancement filters, contact lenses, and refractive surgery for athletes

**Interdisciplinary competence**  
The students will be able to educate the public within their scope of practice.

Competence area	concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>


**Lecture contents**

The theory and practice of sports vision is presented in detail. The course emphasizes exploration of the research base supporting sports vision services, analysis of visual and environmental task demands in sports, evaluation procedures for athletes, and optometric intervention approaches. Strategies for practice development are discussed. The emphasis of the lab portion will be integration of didactic information with instrumentation used in sports vision.

A sports vision screening is conducted with a sports team in the US. This project involves designing the evaluation, creating screening forms, setting up and conducting the screening, analyzing data, and creating reports.

<b>Language</b>	<input type="checkbox"/> German	<input checked="" type="checkbox"/> English	<input type="checkbox"/> Spanish	<input type="checkbox"/> French
	<input type="checkbox"/> Chinese	<input type="checkbox"/> Portuguese	<input type="checkbox"/> Russian	<input type="checkbox"/> Other_____

<b>Literature</b>	Script Erickson, G. (2007): Sports Vision: Vision Care for the Enhancement of Sports Performance. Butterworth-Heinemann.
<b>Composition of the final mark</b>	
<b>Comments/other</b>	Minimum 10 students
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Low Vision</b>				<b>Module no. 29021</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	4	150	60	90	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	2	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		1 <sup>st</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29218	Low Vision	Karl Citek, B.S., O.D., MEd, FAAO Professor at the College of Optometry at the Pacific University  Georg Scheuerer, M.Sc., Andreas Polzer	Lecture	3	4	2	Written exam  30 minutes  graded
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	1 <sup>st</sup>	-				
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	
29310	Low Vision Project	Karl Citek, B.S., O.D., MEd, FAAO Professor at the College of Optometry at the Pacific University  Georg Scheuerer, M.Sc., Andreas	Project presentation	1	1	2	

		Polzer					
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	1 <sup>st</sup>	-				
<b>Permitted aids</b>							

**Learning goals/competence**

**Professional competence**

The students will be able to explain the usage, application and dispensing including fitting of magnifying aids. The students will establish the psychology of a visually handicapped person, behaviour, motivation of patients. They will develop knowledge of medical/ocular conditions requiring the use of low vision aids. The students will be able to generate advanced knowledge of optics and visual application of low vision aids in ocular conditions. They will be able to relate how blind and visually impaired individuals function and their needs including social services.

**Methodological competence**

The students will be able to transfer certain knowledge about the quantity of magnifying aids, how to use and handle them and also about fitting these aids.

**Interdisciplinary general competence**

The students will be able to recommend competent advice, service and discussion.

Competence area	concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


**Lecture contents**

- Pathology (diabetic retinopathy, glaucoma, macula degeneration, retinopathia pigmentosa)
- Visual impairment and blindness
- Medical filter-glasses
- Management of life with reduced vision
- Mobility and orientation
- Social assistance, financial aids
- Development of vision in childhood
- Vision and elder patients
- Electrophysiological diagnostics
- Electronic retinal systems
- Simulation and aggravation
- Fitting of Low Vision aids under real circumstances
- Electronically visual systems
- Social advisory service (social and technical criterions)

<b>Language</b>	<input type="checkbox"/> German	<input checked="" type="checkbox"/> English	<input type="checkbox"/> Spanish	<input type="checkbox"/> French
-----------------	---------------------------------	---	----------------------------------	---------------------------------



	<input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	<p>Bibliographic hints will be given, e.g.</p> <ul style="list-style-type: none"> <li>- Hammerstein: Rehabilitation in der Augenheilkunde</li> <li>- Low Vision Stiftung (Hrsg): 2. Interdisziplinärer Low Vision Kongress, Diagnostik, Therapie, Rehabilitation</li> <li>- Lund, Waubke (Hrsg): Ophthalmologische Rehabilitation</li> <li>- Wagner: Sehbehinderung und Soziale Kompetenz</li> <li>- Diepes, Krause, Rohrschneider: Sehbehinderung</li> <li>- Raem (Editor): Handbuch Geriatrie</li> <li>- Weale: The Senescence of Human Vision</li> <li>- Kampik, Grehn (Hrsg): Augenärztliche Diagnostik</li> <li>- Straub, Kroll, Kühle: Augenärztliche Untersuchungsmethoden</li> <li>- Publications in peer reviewed optometry journals</li> </ul>
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Börret	

<b>Module name</b>		<b>Optical Fabrication Technology</b>				<b>Module no. 29022</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
10	4	300	60	240	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	3 4	<input type="checkbox"/> 1 semester <input checked="" type="checkbox"/> 2 semesters
<b>Target degree</b>		<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>		
Master of Science (M.Sc.)		Elective module		2 <sup>nd</sup>	-		
<b>Form of studies</b>		<input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input checked="" type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report					
<b>Admission requirement</b>							

Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29219	Project Management and Innovation	Prof. Dr. Rainer Börret/Dr. Bernd Dörband/ Katja Schiborr	Lecture Case studies	2	2	3	Project presentation  60 minutes  graded
	<b>Course type</b>	<b>Year of study</b>	-				
	Elective course	2 <sup>nd</sup>	-				
<b>Course no.</b>	<b>Title of the course/lecture</b>	<b>Lecturer</b>	<b>Type</b>	<b>Semester hours per week</b>	<b>CP</b>	<b>Se- mester</b>	
29311	Surface processing and coating technology	Prof. Dr. Rainer Börret/Dr. Bernd Dörband/ Katja Schiborr	Lecture Labs	2	8	4	
	<b>Course type</b>	<b>Year of study</b>	-				
	Elective course	2 <sup>nd</sup>	-				
<b>Permitted aids</b>							

**Learning goals/competence**

**Professional competence**  
 The students will be able to understand the physical and optical properties, as well as the design and function of ophthalmic lenses. They will understand the physical and chemical interaction mechanism of the optical fabrication technologies. They will know the advantages and disadvantages of the optical fabrication technologies related to quality, costs and manufacturing time. After completion, the students can apply the knowledge in an industrial, research and business setting and for an ideal and in-depth counselling of customers.

**Methodological competence**  
 The students will present one scientific study related to technology. They will be able to evaluate studies in terms of the scientific methods, weaknesses, and applicability for their presentation. The students will gain a basis for a future career in the field of research and development in the optical industry.

**Interdisciplinary general competence**  
 The students will demonstrate interdisciplinary thinking, teamwork, project and innovation management as well as presentation techniques.

Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Lecture contents**

Project management and Innovation

- Project target definition, project organization, project design, project controlling, milestones, critical path ...

Surface processing and coating technology


- Computer aided manufacturing
- Algorithms for optical manufacturing
- Molding
- Coating including thin film design
- Metrology for all fabrication steps
- Specification and error budgets

Seminar

- Presentation and report of one optical technology issue
- Understanding of design processes: research, concept, blue print, detailing, implementation, holistic approach, lasting design

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Script and bibliographic hints will be given
<b>Composition of the final mark</b>	

<b>Comments/other</b>	
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. h.c. Dietmar Kümmel	

<b>Module name</b>		<b>Contact Lenses</b>				<b>Module no. 29023</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	3	150	45	105	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	2	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		1 <sup>st</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input checked="" type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>			Knowledge in fitting rigid and soft contact lenses				

Courses/lectures								
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading	
29220	Contact Lenses	Adjunct Faculty	Lecture	2	4	2	Project presentation 20 minutes graded	
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	1 <sup>st</sup>	-					
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester		
29312	Contact Lens Project	Adjunct Faculty	Lab Project	1	1	2		
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	1 <sup>st</sup>	-					
<b>Permitted aids</b>								

**Learning goals/competence**

**Professional competence**  
 The students will demonstrate enhanced knowledge in contact lens fitting in pediatric and presbyopic populations and specialty fittings (e. g. keratoconus after corneal transplants or corneal surgery). They will be able to compare different methods of contact lens fittings and choose the most appropriate method depending on the patient. They will be also be able to identify and analyze fittings and wearing problems in order to solve them in cooperation with the patient.

**Methodological competence**  
 The students will be able to fit contact lenses for children, 40+ and undertake do specialty fittings. After attending the module, they will be able to compare various models from the area of special contact lenses and assess their advantages and disadvantages.


**Interdisciplinary competence**  
 The students will be able to master the knowledge on a level where the students can educate the public within their scope of practice.

Competence area	concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Lecture contents**

- New materials in soft and rigid contact lenses, their specifications and usage
- Current studies and outcomes in relation to contact lenses and solutions
- Affect of dry eye and contact lenses usage
- Silicon hydrogels and alternatives contact lens material options
- Keratoconus update, complications and new studies, fitting options, contact lens fittings and challenges
- Pediatric fitting and challenges, contact lens options
- Cases and usage of bandage contact lenses
- Contact lens options for the pediatric population including management
- Therapeutic usage of contact lenses in pathological corneal disorders
- Types and principles of multifocal lenses fitting and usage
- Special and specific anamnesis related to contact lenses

<b>Language</b>	<input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Bibliographic hints will be given
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. h.c. Dietmar Kümmel	

<b>Module name</b>		<b>Workplace Design</b>				<b>Module no. 29024</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	3	150	45	105	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	3	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		2 <sup>nd</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							


Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29221	Vision, Light and Ergonomics	Prof. Dr. h.c. Dietmar Kümmel	Lecture	2	4	3	Reports and presentation  30 minutes  graded
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	2 <sup>nd</sup>	-				
29313	Workplace Design Project	Prof. Dr. h.c. Dietmar Kümmel	Lecture	1	1	3	Reports and presentation  30 minutes  graded
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	2 <sup>nd</sup>	-				
<b>Permitted aids</b>							

<b>Learning goals/competence</b>			
<p><b>Professional competence</b> The students will know about light and illumination and focus on optimized vision. They will demonstrate theoretical and practical knowledge in the area of workplace design. The students will be able to optimize light and illumination as well as other physical factors in order to create an ideal environment where demanding vision tasks can be performed over a longer period of time.</p> <p><b>Methodological competence</b> The students will be able to design innovative workplaces including tailoring the physical environment to the requirements of developing new knowledge within the organization. They will also be able to communicate to and advise customers comprehensively about possibilities and solutions for their workplace design if problems occur.</p>			
Competence area	concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Lecture contents</b>
<p>Workplace design with a focus on</p> <ul style="list-style-type: none"> <li>- light and illumination and</li> <li>- optimized vision</li> </ul>

<b>Language</b>	<input checked="" type="checkbox"/> German <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Bibliographic hints will be given
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	July 31, 2017



	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Steffen Kreikemeier	

<b>Module name</b>		<b>Audio and Vision</b>				<b>Module no. 29025</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	3	150	45	105	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	2	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		1 <sup>st</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures								
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading	
29314	Audio and Vision	Prof. Dr. Steffen Kreikemeier	Lecture Exercise	2	3	2	Oral exam  30 minutes  graded	
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	1 <sup>st</sup>	-					
<b>Course no.</b>	<b>Title of the course/lecture</b>	<b>Lecturer</b>	<b>Type</b>	<b>Semester hours per week</b>	<b>CP</b>	<b>Se- mester</b>		
29319	Audio and Vision Project	Prof. Dr. Steffen Kreikemeier	Lecture Exercise	1	2	2		
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	1 <sup>st</sup>	-					
<b>Permitted aids</b>								

**Learning goals/competence**

**Professional competence**  
 The students will understand central auditory and visual processing disorders and their therapy. They will be able to detect disorders early by knowing their signs and symptoms and refer them to specialists. They will be able to observe and participate in evaluations and therapy for patients with perceptual problems associated with learning disabilities, traumatic brain injury, stroke and developmental abnormalities. They will know procedures for modifying visual performance associated with hearing and co-manage strategies.

**Methodological competence**  
 The students will be able to detect dyslexia in the pediatric population and know the fundamental importance of early detection. They will know when and where to refer an affected person and how to co-manage auditory-visual processing disorders by enhancing the vision part.


**Interdisciplinary general competence**  
 The students will be able apply this knowledge to patient care.

Competence area	concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Lecture contents**

- Development of the brain with target on auditory and visual processing
- Central auditory/visual processing
- Tests for the auditory and visual perception
- Pediatric issues with auditory/visual processing disorders
- Therapy of central auditory and visual processing disorders

<b>Language</b>	<input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Script Bibliographic hints will be given
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Eye Glass Design</b>				<b>Module no. 29026</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	4	150	60	90	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	3/4	<input type="checkbox"/> 1 semester <input checked="" type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		2 <sup>nd</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29315	Eye Glass Design	Dr. Anne Seidemann Dr. Wolfgang Becken	Lecture	2	3	3	Written test and project presentation  90 minutes graded
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	2 <sup>nd</sup>	-				
29320	Eye Glass Design Project	Dr. Anne Seidemann Dr. Wolfgang Becken	Project presentation	2	2	3	Written test and project presentation  90 minutes graded
	<b>Course type</b>	<b>Year of study</b>					
	Elective course	2 <sup>nd</sup>	-				
<b>Permitted aids</b>							

**Learning goals/competence**

**Professional competence**  
 The students will have theoretical and practical competence in the optical features of spectacles as well as a deeper knowledge in product characteristics and patents. They will be able to recall important eye glass design factors for comfortable vision, such as aberrations due to curvature, thickness and other eye glass design criteria. The students will also be able to identify and solve problems that can occur in patients based on their presented symptoms.

**Methodological competence**  
 The students will have practical competence in optical features of spectacles. They will be able to integrate the technical and optical characteristics of lenses with physiological consequences in vision.


**Interdisciplinary general competence**  
 The students will advance teamwork and communication skills during the experiment and project.

Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Lecture contents**

- Monocular criteria for optimal vision
- Binocular criteria for optimal vision
- Optimization example of an eyeglass lens
- Patent analysis of lenses
- Aberrations of single vision and progressive lenses
- Curvature/thickness/weight measurements
- Experiment on spectacle wearing
- Comparison of actual spectacles

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other _____
<b>Literature</b>	Script Bibliographic hints will be given, e.g. Diepes, H./Blendowske, R. (2005): Optik und Technik der Brille. 2 Ed. DOZ-Verlag Optische Fachveröffentlichung. Heidelberg. Jalie, Mo (2008): Ophthalmic Lenses and Dispensing, 3 Ed., Butterworth Heinemann Elsevier.
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	


<b>Module name</b>		<b>Marketing Management</b>				<b>Module no. 29027</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	3	150	45	105	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	4	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		2 <sup>nd</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							

Courses/lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29121	Marketing	Prof. Dr. Anna Nagl/ Prof. Dr. Stiefl/ Adjunct Faculty	Lecture	2	2	4	Case Study  20 minutes graded
	<b>Course type</b>		<b>Year of study</b>				
	Elective course		2 <sup>nd</sup>		-		
29122	Marketing Project	Prof. Dr. Anna Nagl/ Adjunct Faculty	Project presentation	1	1	4	Case Study  20 minutes graded
	<b>Course type</b>		<b>Year of study</b>				
	Elective course		2 <sup>nd</sup>		-		
<b>Permitted aids</b>							

<b>Learning goals/competence</b>			
<p><b>Professional competence</b> The students will have a detailed and comprehensive integration of all major components of marketing strategies. They will be able demonstrate in-depth knowledge about all aspects of marketing, such as strategic marketing and product planning, product development, pricing and distribution. The students will be able to understand the theories and roles behind marketing mix variables. The students will also be able to apply their knowledge in an optometric setting.</p> <p><b>Methodological competence</b> The students will develop a marketing strategy for an optometrist`s practice and/or an industrial company. They will be able to plan marketing concepts and apply tools (e. g. strategy design and marketing management). They will be able to assess various marketing tools and work out a strategic plan that best suits their business.</p>			
Competence area	concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Lecture contents</b>
Marketing and it's planning process Marketing methods and tools for optometrists Service marketing in optometry Customer Relationship Management (CRM) and Total Loyalty Marketing (TLM) Case/Project study, e.g. Concept of measurement of customer satisfaction in an optometry practice Organizing and implementation of a marketing event Publication of an article in an optometry magazine

<b>Language</b>	<input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Script Distance learning platform moodle Bibliographic hints will be given, e.g. <ul style="list-style-type: none"> <li>- Nagl, A. (2017): Der Marketingplan. Die 10 Gebote erfolgreichen Marketings. 2. Ed. Beck Verlag. München.</li> <li>- Nagl, A. (2004): Dienstleistungsmarketing in der Augenoptik: Ein Ratgeber für die Praxis. DOZ-Verlag. Heidelberg.</li> <li>- Bruhn, M. (2014): Marketing. Grundlagen für Studium und Praxis. 12. Ed. Springer Gabler Verlag. Wiesbaden.</li> <li>- Bruhn, M. (2014): Marketingübungen. Basiswissen, Aufgaben, Lösungen. 4. Ed. Springer Gabler Verlag. Wiesbaden.</li> </ul>
<b>Composition of the final mark</b>	
<b>Comments/other</b>	Minimum 10 students
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Business Simulation</b>				<b>Module no. 29028</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	4	150	60	90	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	2 3	<input type="checkbox"/> 1 semester <input checked="" type="checkbox"/> 2 semesters
<b>Target degree</b>		<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>		
Master of Science (M.Sc.)		Elective module		1 <sup>st</sup>	-		
<b>Form of studies</b>		<input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report					
<b>Admission requirement</b>		Basic knowledge in business and marketing, knowledge of core concepts in strategic management, business administration, leadership and marketing					

Courses/lectures								
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading	
29222	Business Strategy	Prof. Dr. Anna Nagl/ Adjunct Faculty	Lecture	2	3	2	Oral exam and presentation  30 minutes  graded	
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	1 <sup>st</sup>	-					
29223	Business Simulation Project	Prof. Dr. Anna Nagl/ Adjunct Faculty	Project presentation	2	2	3	Oral exam and presentation  30 minutes  graded	
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	2 <sup>nd</sup>	-					
<b>Permitted aids</b>								

**Learning goals/competence**

**Professional competence**  
 The students will be able to make strategic decisions and realize concepts in leadership, strategy, management and marketing. They will demonstrate knowledge about basic business characteristics of an optometry practice, such as mission statements, calculations, budget planning and management options. They will be able to overview complex relationships within a business itself and in connection with competitors.

**Methodological competence**  
 The students will be able to manage complex business decisions under pressure. They will get immediate feedback in a simulated environment. The students can therefore try out various ways of handling difficult situations and decisions in an actual business.

**Interdisciplinary general competence**  
 The students will gain experience in teamwork, project management skills and presentation skills. The students will be able to enhance their company's profitability and marketplace position.

Competence area	concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Lecture contents**

Business tools and methods related to this business project in the field of optometry, e.g.:


- Mission Statement and Values
- Balanced Scorecard
- Calculation, direct costing and break-even analysis
- Budget planning
- New management concepts and Key Performance Indicators (KPIs)

Business simulation, strategic and operational game in the field of optometry

- Planning of a virtual business unit
- Business game with computer simulation
- Presentation of strategies, milestones and results

<b>Language</b>	<input type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Script Distance learning platform moodle <ul style="list-style-type: none"> <li>- Manual of the management game</li> <li>- Special literature for deepening the knowledge in special fields</li> </ul>
<b>Composition of the final mark</b>	
<b>Comments/other</b>	Minimum 10 students
<b>Last updated</b>	July 31, 2017



	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Business Management</b>				<b>Module no. 29029</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	4	150	60	90	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	3	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		2 <sup>nd</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input type="checkbox"/> Assignment <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Paper, Report				
<b>Admission requirement</b>							


Courses/lectures								
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading	
29224	Value Based Management	Prof. Dr. Anna Nagl/ Adjunct Faculty	Lecture	2	2	3	Businessplan  30 minutes graded	
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	2 <sup>nd</sup>	-					
<b>Course no.</b>	<b>Title of the course/lecture</b>	<b>Lecturer</b>	<b>Type</b>	<b>Semester hours per week</b>	<b>CP</b>	<b>Se- mester</b>		
29317	Business Plan	Prof. Dr. Anna Nagl	Lecture Tutorial	2	3	3		
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	2 <sup>nd</sup>	-					
<b>Permitted aids</b>								

<b>Learning goals/competence</b>			
<p><b>Professional competence</b> The students will interpret enterprise risk and value from the shareholder's perspective. This includes the knowledge and understanding of strategic management processes to ensure system integrity with internal and external environments.</p> <p><b>Methodological competence</b> The students will be able to transfer business management skills in the field of optometry, such as how to create value, how to manage value and how to measure value. The students will be able to evaluate alternative strategic options for the optometry practices.</p> <p><b>Interdisciplinary general competence</b> The students will validate this knowledge by developing and presenting a business plan.</p>			
Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Lecture contents</b>
<ul style="list-style-type: none"> <li>- Accounting</li> <li>- Rating, Basel convention</li> <li>- Annual statements, financial ratios</li> <li>- Calculation</li> <li>- Controlling</li> <li>- Investment and Financing</li> </ul> <p>Development of a business model and a business plan, e.g.</p> <ul style="list-style-type: none"> <li>- for a project within a company</li> <li>- for a start-up company</li> </ul> <p>including</p> <ul style="list-style-type: none"> <li>- Drafting and realization of an application-oriented business</li> <li>- Plan facts and data on founding a business</li> <li>- Descriptions, errors in designing a business plan</li> <li>- Application of calculation realization of a business plan</li> <li>- etc.</li> </ul>

<b>Language</b>	<input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	<p>Script</p> <p>Bibliographic hints will be given, e.g.</p> <ul style="list-style-type: none"> <li>- Nagl, A./Bozem, K. (2018): Geschaeftsmodelle 4.0. Business Model Building mit Checklisten und Fallbeispielen. Springer Gabler Verlag. Wiesbaden.</li> <li>- Nagl, A. (2015): Der Businessplan. Geschäftspläne professionell</li> </ul>

	erstellen. 8. Ed. Springer Gabler Verlag. Wiesbaden.
<b>Composition of the final mark</b>	
<b>Comments/other</b>	Minimum 10 students
<b>Last updated</b>	July 31, 2017

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Clinical Project Study</b>				<b>Module no. 29030</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	1	150	15	135	<input checked="" type="checkbox"/> winter semester <input type="checkbox"/> summer semester	3	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		2 <sup>nd</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Clinical Case Experience in a clinic				
<b>Admission requirement</b>							

Courses/ lectures								
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/grading	
29321	Clinical Project	Adjunct Faculty	V, L	1	4	3	Written report graded	
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	2 <sup>nd</sup>	-					
29324	Clinical Project Presentation	Adjunct Faculty	P	-	1	3		
	<b>Course type</b>	<b>Year of study</b>						
	Elective course	2 <sup>nd</sup>	-					
<b>Permitted aids</b>								

**Learning goals/ competence**

**Professional competence**  
 The students will be able to identify problems in the clinical field. They will be able to design a plausible solution to the problem using scientific techniques. The students will also be able to carry out validation procedures to establish the effectiveness of the proposed solution.

**Methodological competence**  
 The students will be able to analyze and structure a problem in the clinical field. They will be able to design a solution based on basic scientific research techniques.


**Interdisciplinary general competence**  
 The students will be able to conduct a general ocular health assessment in the overall management of patient conditions relative to referrals and consultations.

Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Lecture contents**

Manufacturing and presenting a clinical project based on scientific research tools

<b>Language</b>	<input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Lectures: "Introduction to Ocular Disease"
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	June 16, 2015

	<b>Faculty</b> Optics and Mechatronics	Module description
	<b>Course of Study</b> M.Sc. Vision Science and Business (Optometry)	
	<b>Module Coordinator</b> Prof. Dr. Anna Nagl	

<b>Module name</b>		<b>Clinical Case Studies: Logbook</b>				<b>Module no. 29031</b>	
<b>CP</b>	<b>Semester hours per week</b>	<b>Workload</b>	<b>Contact time</b>	<b>Self study</b>	<b>Begin of offer</b>	<b>Se- mester</b>	<b>Duration</b>
5	1	150	15	135	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> summer semester	4	<input checked="" type="checkbox"/> 1 semester <input type="checkbox"/> 2 semesters
<b>Target degree</b>			<b>Module type</b>		<b>Year of study</b>	<b>Relevance in courses of study</b>	
Master of Science (M.Sc.)			Elective module		2 <sup>nd</sup>	-	
<b>Form of studies</b>			<input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Self study <input type="checkbox"/> Seminar <input checked="" type="checkbox"/> Project work <input checked="" type="checkbox"/> Other: Clinical Case Experience in a clinic				
<b>Admission requirement</b>							

Courses/ lectures							
Course no.	Title of the course/lecture	Lecturer	Type	Semester hours per week	CP	Se- mester	Module exam: type/length/ grading
29323	Clinical Experience	Georg Scheuerer, M.Sc.	V, L	1	4	4	Written report (logbook)  graded
	<b>Course type</b>		<b>Year of study</b>				
Elective course		2 <sup>nd</sup>		-			
29324	Case Documentation	Georg Scheuerer, M.Sc.	P	-	1	4	
	<b>Course type</b>		<b>Year of study</b>				
Elective course		2 <sup>nd</sup>		-			
<b>Permitted aids</b>							

<p><b>Learning goals/ competence</b></p> <p><b>Professional competence</b>          The students will be able to appraise patients with and without visual disorders/diseases especially clinically. The students will be able to transfer further skills in optometric examination techniques. The students will be able to discriminate between healthy and pathologic findings that might be presented differently from "textbook cases". They will be able to organize and grade the findings and know when referrals are necessary.</p> <p><b>Methodological competence</b></p>
--

The students will be able to generate techniques to detect eye diseases through practical experience with feedback from supervising ophthalmologists and lecturers. They will be able to prepare evidence-based optometric knowledge and practical experience in order to make the right decision. The students will be able to summarize their findings.

**Interdisciplinary general competence**

The students will be able to assess patients (anterior and posterior segment) and detect abnormal conditions, to evaluate the central retina (optic nerve and fovea) and to develop the logbook. They will be able to justify their findings in an appropriate way for patients within their scope of practice.

Competence area	Concentration	minor concentration	in small amounts
Professional competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methodological competence	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interdisciplinary general competence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Lecture contents**

- Basics of the scientific process
- Internalize and deliberate the clinical experience and documentation

<b>Language</b>	<input checked="" type="checkbox"/> German <input checked="" type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> French <input type="checkbox"/> Chinese <input type="checkbox"/> Portuguese <input type="checkbox"/> Russian <input type="checkbox"/> Other_____
<b>Literature</b>	Lectures: "Introduction to Ocular Disease" Script Scheuerer, G., Patel, B., Nagl, A., (2014): Klinisches Logbuch: Best Practice Dokumentation. Schriftenreihe aus dem DOZ-Verlag 33. Optische Fachveröffentlichung. Heidelberg. English version: Handout
<b>Composition of the final mark</b>	
<b>Comments/other</b>	
<b>Last updated</b>	June 16, 2015