Projekt „Specijalistički diplomski stručni studij optometrije - Specialist Graduate Professional Study in Optometry“
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Specialist Graduate Professional Study in Optometry

Velika Gorica, June 2019

Europska unija
“Zajedno do fondova EU”
EUROPSKI STRUKTURNI I INVESTICIJSKI FONDOVI
ESF UČINKOVITI LJUDSKI POTENCIJALI

Projekt je sufinancirala Europska unija iz Europskog socijalnog fonda.

NR.	SUBJECT NAME	SEMESTER	TYPE	ECTS
1.	Anterior Segment Pathology	1	Obligatory	7
2.	Paediatric Optometry and Strabismus	1	Obligatory	7
3.	Business Ethics in Optometry	1	Obligatory	4
4.	Ocular Pharmacology	1	Obligatory	6
6.	Eye Related System Pathology	1	Elective	5
7.	Low vision	2	Obligatory	6
8.	Posterior Segment Pathology	2	Obligatory	7
9.	Refractive Surgery	2	Obligatory	6
10.	Special Contact Lenses	2	Obligatory	6
11.	Vision Therapy	2	Elective	5
12.	Glaucoma and other Neurological Disorders of the Visual System	2	Obligatory	7
13.	Visual Perception and Cognition	3	Obligatory	6
15.	Research Methods	3	Obligatory	6
16.	Clinical Practice 1	3	Obligatory	7
17.	Sport Vision	3	Elective	5
18.	Clinical Practie 2	4	Obligatory	7
19.	Master Thesis	4	Obligatory	25
20.	Microbiology and Immunology	4	Elective	3
21.	First Aid	4	Elective	4
Total:				**129**

Course Name: Anterior Segment Pathology			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
1	2+3+0	75	7

Course Coordinator:

Course Teaching Staff:

Course Aims:
To introduce the role of the optometrist in primary eye care and most common anterior eye segment diseases; to provide advanced knowledge about new diagnostic techniques; to be able to perform all evaluations and examinations and to be able to recognize pathological conditions.
The most common clinical signs and diseases of anterior eye segment will be presented, discussed and new therapy guidance will be given.
The optometrist will get the opportunity to talk to the patient about their likely diagnosis and to advise them, as well as be able to determine which patients may be managed in practice and which should be referred to an ophthalmologist.

Course Content:

Advanced knowledge in new diagnostic methods and treatment options for anterior segment eye diseases

1. **Advancements and clinical applications of anterior segment imaging techniques:**
   - Slit lamp biomiscroscopy
   - Anterior segment optical coherent tomografy
   - Corneal endothelial specular microscopy
   - Ultrasound biomicroscopy - UBM
   - Rotating Scheimpflug imaging – Pentacam
   - Aberrometer- different types

2. Disorders of lacrimal system and dry eye desease: current advancements, challenges and future trends

Basic knowledge about;

- lacrimal gland,
- diseases of lacrimal gland,
- pathway and pathology of the lids.

Basic knowledge about;

- prevalence of dry eye; signs and symptoms, causes, diagnostic tests, factors associated with dry eye syndrome

Advanced knowledge of new medications and treatment options

3. Overview of conjunctival and scleral disorders

Theoretical knowledge of;

- inflammation signs and symptoms,
- degenerations and tumors of conjunctiva,
- causes,
- diagnostic tests,
- prevention

Advance knowledge in therapy and future trends

4. Managing blepharitis and eyelid growths - new approaches

Theoretical knowledge of eyelids inflammation;

- prevalence,
- signs and symptoms,
- causes,
- diagnostic tests,
- factors associated with blepharitis
- Overview of noncancerous (benign) and cancerous (malignant) growths on the eyelids
- New approaches in treatment and prevention

5. Infectious keratitis: predisposing factors, morbidity and new prescribing trends in treatment

Theoretical knowledge of:

- corneal biomechanic and wound healing
- inflammation pathophysiology,
- different types of keratitis: bacterial, viral, fungal, treatments.
- Advance knowledge in prophilaxis and future directions

6. Current treatment trends for patients with keratoconus and corneal ectasia

- Advance knowledge in keratoconus and cornael ectasia: epidemiology, clinical features, histopathology, etiology and pathogenesis, topographic studies, differential diagnosis.
  Latest approaches in therapy with:
- contact lenses,
- collagen cross liniking - different protocols; intrastromal corneal rings and corneal transplantation

7. The iris – a window into the genetics of common and rare eye diseases
Theoretical knowledge of:

- General iris disorders
- Chromosomal anomalies and trauma

8. Lens

Theoretical knowledge of:

- lens variations,
- ageing changes,
- cataract,
- clinical evaluation,
- surgical treatment,
- postoperative treatment and possible complication

9. Clinical challenges in anterior segment ocular deseases

- Presentation of most interesting and challenging cases from clinical practise
- Patients with Fuchs corneal dystrophy
- Patients with corneal transplants (lamellar or after perforating keratoplasty)
- Patients with corneal scars, limbal stem cell deficiency, symblepharon…

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
-knowledge about new diagnostic methods and their fundamental functional principles
-the ability to individually perform all techniques required for the clinical assessment of the anterior eye segment and to interpret results
-ability to understand normal variations and abnormal findings of the anterior eye segment
- additional advanced and detailed knowledge about different and most common anterior segment diseases
- the ability to synthesise a diagnostics and treatment plan, based on the most likely differential diagnoses, clinical findings and symptoms, and further implement a management strategy to achieve the best outcome for the patient
- acquired a broad understanding of the aetiology and treatment of the most common encountered diseases of the anterior eye segment, with special emphasis to the ectatic corneal disease and cases of keratoconus patients

Course Learning Outcomes:
After finishing this course student will know how to:

1. Recognise signs and symptoms related to anterior eye diseases
2. Asses which diagnostic methods are recommended for that patient based on gathered information.
3. Identify when a patient with some corneal signs may be managed in practice, and when a patient is to be referred to the ophtalmologist or to the hospital emergency deparment for eye treatment
4. Identify signs and symptoms indicating progression in keratoconus patients
5. Identify signs and symptoms of cataract development

Teaching Strategies:
Online lecture, Exercises, Self study

Exercises Type (Laboratory / Auditory / Clinical)
Online auditorial exercises, Clinical exercises, Laboratory

Exercises Content:
Slit lamp biomiscroscopy, Anterior segment optical coherent tomografy, Corneal endothelial specular microscopy, Ultrasound biomicroscopy – UBM, Rotating Scheimpflug imaging – Pentacam, Aberrometer- different types

Student Obligations and Conditions:
Attendance in online lectures and exercises with active participation.
Regularity and execution of exercise tasks.

Student Assessment Methods:
Online Lectures and Online Exercises Presence and Activity.
Face to Face Exercises Presence and Activity
Quiz, case report and final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
Yes	Online Lectures and Online Exercises Presence and Activity	12	15
Yes	Face to Face Exercises Presence and Activity	12	15
No	Case Report	0	10
No	Quiz	17.5	35

No	Final Exam	12.5	25
	TOTAL POINTS:	**53.5**	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 210 hours (7 ECTS):

- Online Lectures – 30 hours (1.0 ECTS).
- Exercises – 45 hours (1.5 ECTS).
  - Online Exercises – 15 hours (0.5 ECTS)
  - Face to Face Exercises – 30 hours (1.0 ECTS)

Individual student work: preparing the case report, reading the literature and preparing for the quiz, exercises and final examination – 135 hours (4.5 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1.0	1-5	Online discussion with students, attendance record.
ONLINE EXERCISES	0.5	1-5	Online discussion with students, attendance record.
FACE TO FACE EXERCISES	1.0	1-5	Discussion with students, attendance record.
STUDENTS WORK	4.5	1-5	Quiz and final exam
TOTAL	**7 ECTS**		

Compulsory Literature:

1. Jack Kanski, J. (2016): Clinical Ophthalmology: A Systematic Approach. 8-th edition.
2. Course materials on the Internet
- Handouts

Recommended Literature:

Notices:

Update History:

Course Name: Paediatric Optometry and Strabismus			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
1	3+3+0	90	7

Course Coordinator:

Course Teaching Staff:

Course Aims:

Normal systemic growth and development juxtaposed with concurrent ocular growth and developmental markers. Assessment o f children in different age groups.
Diagnosis and management of refractive, binocular, and ocular disorders including ocular disease common to the paediatric p opulation.
Management strategies and treatment regimens for the remediation of childhood visual disorders to include application of spect acles, contact lenses, prisms, treatment of amblyopia.
Unique strategies for the examination and quantification of children's needs in an optometric setting. Special tests and alternative tests for children. Practice management and office layout strategies for the practice with a paediatric emphasis.
Orthoptic examination and therapy

Course Content:

Optometric examination and management of infants, children and patients with learning disabilities or multiple-challenges.
General child development and the development of the optical and sensory
motor functions of the visual system. Learning disabilities and related vision problems. The role of the optometrist in conjunction with parents, teachers and psychologists.
Epidemiology of eye and vision disorders in children.
Paediatric communication
Assessment of visual acuity and development of the visual system.
Orthoptic examination and therapy

Human Development

Normal vision and motor development in the infant and child

- Visual acuity, Contrast sensitivity, Refractive error, Colour vision, Spectral transmission of the ocular media, Light sensitivity, Form reproduction and perception
- Gross motor/language development milestones, Oculomotor system, Visual perceptual-motor abilities

Normal cognitive and social development in the infant and child
Effects of early environmental restrictions

- Plasticity of the system, Animal modeIs, Light and pattern deprivation, Monocular and binocular deprivation, Refractive error, Cataract, Strabismus

Anomalies of Child Development

Clinical characteristics of children who deviate from normal patterns of development, and epidemiology of developmen t disorders

- Sensory abilities (vision and hearing handicaps)

Tests that diagnose vision problems which may be associated with deviations from normal patterns of development

- Sensory abilities (vision and hearing handicaps)

Tests used by optometrists to determine a child's level of visual perceptual development

- Visual attention and discrimination, Visual-motor integration, Intersensory integration, Bilateral integration and laterality

Role of optometrists and other disciplines in screening, evaluating, managing and referring children who deviate from normal patterns of development

- Sensory abilities (vision and hearing handicaps), Neuromuscular and physical abilities, Personal-social behaviours, Speech and language abilities, Multiple handicaps, Specific learning disabilities

Refractive examination

- Refractive errors (Myopia, hyperopia, astigmatismus), Development theories, Prevalence, Progression, Management

Binocular vision disorders

- Aetiology, Pathophysiology, Clinical characteristics, Clinical investigation, Diagnosis, Management

Paediatric eye disorders

- Cataracts, Amblyopia, Retinopathy of Prematurity, Visual dysfunction, Congenital, Neuromuscular

Spectacle dispensing

- Paediatric contact lenses
- Low vision assessment and management

Examination of infants (under 12 months), toddlers (12 to 36 months), preschool children and school-age children

- General considerations, Early detection and prevention, Examination sequence, Case history , Visual acuity, Refraction, Binocular vision and ocular motility, Ocular health assessment and systemic health screening,

Assessment and diagnosis

Management of children

- Children and parent education, Coordination, frequency, and extent of care

<u>Orthoptic examination and therapy</u>

Ocular motility

- Saccadic system ,Smooth pursuit system,Vergence System

Intraocular musculature (pupillary reflexes and accommodation)

Extraocular muscle Anatomy and Innervation

- Types of strabismus pseudostrabismus,Tropias (Esotropia, Exotropia, Vertical strabismus),Phorias (Esophoria, Exophoria, vertical strabismus, Microtropia),Normal Sensory visual system and disorders

Normal Sensory visual system and disorders

- Fusion, Binocular single vision, Stereovision, Assessment treatment of Dyplopias, Accomodationa and vergence dysfunction

Neuromuscular disorders

- Paresis and paralysis of n III, Paresis and Paralisys of n IV, Paresis and Paralisys of n VI, Mehanical Paralytic strabismus, Myogenic Dysorders, Nystagmus

Supplemental orthoptic tests for assessment and diagnosis of strabismus

- Different Types of Cover tests, Assesment of tropias (Esotropia, Exotropia, Vertical strabismus), Assesments of phorais (Esophoria, Exophoria, and Vertical strabismus), Assesment of fusion in infants Asssesment of fusion in todlers, Assesment of accomodation and vergence, Assesment of binocularity, Different types of stereotests, Motility disorder

Assessment of Neuromuscular disorders

- Assessment of n III paresis, Assessment of n IV paresis, Asssesment of n VI paresis

Treatment of tropias and phorias, Dyplopia, Neuromuscular disorders

- Optical Correction, Prism Therapy, Surgery

Treatment for Accommodative Dysfunction

- Optical correction, Prism theratpy, Orthoptic treatment

Management Strategy for Vergence Dysfunction

- Optical correction, Prism theratpy, Orthoptic treatment, Surgery
- Patient Education
- Prognosis and Follow-up

Amblyopia

- Description and Classification: Deprivation Amblyopia, Refractive Amblyopia, Strabismic Amblyopia
- Epidemiology of Amblyopia: Prevalence and Incidence, Risk Factors
- Clinical Background of Amblyopia: Natural History, Common Signs, Symptoms, and Complications, Early Detection and Prevention
- Diagnosis of Amblyopia: Patient History, Ocular Examination
- Management of Amblyopia : Basis for Treatment, Available Treatment Options
- Patient Education
- Prognosis

General and Specific Competencies (knowledge, understanding, skills and abilities):

After finishing this course student will have:

Understanding of typical visual development and common abnormal visual outcomes.
Detailed knowledge of the protocols for vision screening pathways.
Ability to take an accurate history from patients with a range of optometric conditions specific to children and infants.
Ability to obtain and interpret information on significant symptoms pertinent to paediatric conditions and patient's or parent's concer ns.
Ability to obtain and interpret information on relevant family history pertinent to paediatric conditions.
Ability to obtain and interpret information on patient's general health, medication, school work, sports, hobbies, lifestyle, and special needs pertinent to children and infants.
Detailed knowledge of how to examine ocular health in children.
Understanding and ability to apply techniques for assessment of vision in infants, toddlers and preschool children.
Ability to assess children's visual function using appropriate techniques.
Ability to manage children with impaired visual function (using appropriate techniques or referral).
Understanding of normal eye movement system function and development.
Ability to take an accurate orthoptic history from patients with a range of orthoptic conditions specific to children and infants.
Ability to obtain and interpret information on relevant family history pertinent to strabismic conditions.
Detailed knowledge of how to examine motor sensorybinocular system in children
Understanding and ability to apply techniques for assessment of orthoptic examination ofnfants, toddlers and preschool children.
Ability to examine motor and sensory binocular system in adults
Understanding and ability to apply orthoptic assessment techniques in adults
Ability to recognise possible treatment.
Ability to manage children with impaired visual function (using appropriate techniques or referral).

Course Learning Outcomes:
After finishing this course student will know how to:

1. Knowledge of paediatric optometry including prescribing criteria, amblyopia therapy and referral criteria.
2. Use a systematic understanding of the various techniques for investigating children's visual functions and ocular health
3. Provide a detailed explanation of ocular pathology affecting the paediatric population group.
4. Communicate effectively with children, parents, relatives and carers.
5. Use appropriate judgement in patient management.
6. Use techniques to diagnose paediatric ocular problems.
7. Refer paediatric patients appropriately.

Teaching Strategies:
Online Lecture, Practical clinical exercises

Exercises Type (Laboratory / Auditory / Clinical)
Cinical exercises.

Exercises Content:
Paediatric communication
Assessment of visual acuity
Examination of Infants (under 12 months), Toddlers (12 to 36 months), Preschool Children and School-Age Children
Paediatric glasses contact lenses prescription

Student Obligations and Conditions:
Attendance in online lectures and online and face to face exercises with active participation in discussion.

Student Assessment Methods:
Online Lectures and Online Exercises Presence and Activity.
Face to Face Exercise Attendance
Quizzes, Case report and final exam.

Scoring Criteria:

Requirement for exam application	Crediting criteria	Minimal credits	Maximal credits
No	Online Lectures and Online Exercises Presence and Activity	5	10
Yes	Face to Face Exercises Presence	5	10
No	Quiz 1	10	20
No	Quiz 2	10	20
Yes	Case Report	0	15
No	Final exam	12.5	25
	TOTAL POINTS:	**42.5**	100

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 210 hours (7 ECTS)

- Online Lectures – 45 hours (1.5 ECTS)
- Exercises – 45 hours (1.5 ECTS).
  - Online Exercises - 15 hours (0.5 ECTS)
  - Face to Face Exercises - 30 hours (1.0 ECTS)
- Individual student work: reading the literature and preparing for the quiz and case report, exercises and final examination – 120 hours (4,00 ECTS)

Constructive alignment:

TEACHING ACTIVITIES	STUDENT WORKLOAD	OUTCOMES	MONITORING METHOD / TEST
LECTURE	1.5	1-7	Online discussion with students, attendance record

ONLINE EXERCISES	0.5	1-7	Online discussion with students, attendance record
FACE TO FACE EXERCISES	1	1-7	Discussion with students, control of acquired knowledge in exercises.
STUDENT WORK	4	1-7	Quiz, case report and final exam
TOTAL	**7 ECTS**		

Compulsory Literature:

1. Pediatric Ophthalmology and Strabismus, American Academy of Ophthalmology, 2011

Recommended Literature:

2. Pediatric Clinical Ophthalmology, Scott E. Olitsky, MD, Leonard B. Nelson, MD, 2012
3. Pediatric Ophthalmology for Primary Care, Kenneth W. Wright, MD, FAAP, 2008

Notices:

Update History:

Course Name: Business Ethics in Optometry			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
1	2+1+0	45	4

Course Coordinator:

Course Teaching Staff:

Course Aims:
The candidates should demonstrate fundamental understanding and knowledge in the ethical and cultural standard in optometry, communication process and inportance of continuing professional development activities to maintain competencies and knowledge in areas of optometric practice.

Course Content:
- The rules of business ethics in relation to clients, associates and society.
- Concepts, basic features of communication and verbal and non-verbal communication.
- Ethical issues and cultural differences in communication.
- Ethical and proffesional responsibility to the clients's helf wellbeing, rights, dignity, autonomy
- Obligation of confidentiality of the received information.

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
Understanding and successful application of business ethics.

- The ability to use verbal and non – verbal communication in a respectful tone and manner with clients and associates
- The ability to use interpersonal communication skills in order to listen actively, provide information in an appropriate way, ask questions and unerstand the client's concerns and viewpoints
- The ability to recognise and adjust to cultural defferences
- The ability to apply the rules of business ethics in relation to client's and associates
- The ability to look after client's in an appropriate and confidential environment
- The ability to be aware of continuing professional development in areas of optometric practise

Course Learning Outcomes:
After finishing this course student will know how to:
1. Identify the basic elements of communication.
2. Compare the components of verbal and non-verbal communication.
3. To apply interpersonal communication skills and techniques
4. To relate acquired knowledge of bussiness ethics with optometric practice
5. To recognise inportance of professional development

Teaching Strategies:
Online lectures and online exercises

Exercises Type (Laboratory / Auditory / Clinical)
Auditory

Exercises Content:
Enhancing communication skills: recognizing the source of communication difficulties, active listening, ethical issues relating to practice.

Student Obligations and Conditions:
Attendance in online lectures and exercises with active participation. Self study

Student Assessment Methods:
Online Lectures and Online Exercises Presence and Activity.
Quizzes and final exam.

Scoring Criteria:

Requirement for exam application	Crediting criteria	Minimal credits	Maximal credits
Yes	Online Lectures and Online Exercises Presence and Activity	12.5	25
No	Quiz 1	13	25
No	Quiz 2	13	25
No	Final exam	13	25

TOTAL POINTS:	**51.5**	100

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 120 hours (4 ECTS):

- Online Lectures – 60 hours (1.5 ECTS)
- Online Exercises – 15 hours (0.5 ECTS)
- Individual student work: reading the literature and preparing for the quizzes and final examination – 60 hours (2.0 ECTS)

Constructive alignment:

TEACHING ACTIVITIES	STUDENT WORKLOAD	OUTCOMES	MONITORING METHOD / TEST
ONLINE LECTURE	1.5	1-5	Online discussion with students, attendance record
ONLINE EXERCISES	0.5	1-5	Online discussion with students, attendance record.
STUDENT WORK	2.0	1-5	Quizzes and the final exam.
TOTAL	**4 ECTS**		

Compulsory Literature:
1. Bailey, R.N. & Heitman E. (2000). *Ethics in clinical optometry: an optometrist's guide to clinical ethics*. American Optometric Association.

Recommended Literature:
1. Dickson, D., Hargie, O., & Morrow, N. (Eds.) (1996). *Communication Skills Training for Health Professionals*. London: Chapman and Hall Medical.

2. Trevino, L. K. & Nelson, K. A. (2016). *Managing business ethics: Straight talk about how to do it right*. John Wiley & Sons.

Notices:

Update History:

Course Name: Ocular Pharmacology			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
1	3+0+0	45	6

Course Coordinator:

Course Teaching Staff:

Course Aims:
The students will be provided with a strong knowledge base in pharmacology and therapeutics that will benefit in future optometry practice and the essential knowledge of the mechanisms of action of pharmacological agents and their therapeutic use in the treatment of ocular diseases.

Course Content:

General principles
- Factors affecting ocular drug bioavailability
- Routes of ocular drug administration

Autonomic drugs
- Functional concepts and ocular receptor types
- Ocular cholinergic agents
- Ocular adrenergic agents

Local anaesthetics
- Properties of topical ocular anaesthetics (non-injectable)

Antihistamines

Anti-inflammatory agents
- Steroid
- Non-steroids (including mast cell stabilizers)

Chemotherapeutic agents
- Antimicrobials
- Antivirals
- Antifungals

Dyes
- Topical diagnostic agents
- Oral and intravenous agents

Hyperosmotic agents
- Topical diagnostic agents

Lubricants and tear substitutes

Preparations used with contact lenses

Toxicology
- Ocular effects from topical ocular drug administration
- Ocular effects from systemic drug administration
- Systemic effects from ocular drug administration

Survey of ophthalmic drug usage. Mechanisms of how the drugs work, effectivity, side effects on ;
- Glaucoma drugs
- sulfonamides,
- antibiotics
- anti-viral agents
- anti-fungal agents
- corticosteroids
- others

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
Ability to describe factors affecting ocular drug bioavailability.
Ability to describe routes of ocular drug administration.
Ability to describe functional concepts and ocular receptor types.
Ability to describe ocular cholinergic agents and adrenergic agents.
Ability to describe properties of topical ocular anaesthetics (non-injectable).
Ability to describe properties and effects of antihistamines.
Ability to describe steroids as anti-inflammatory agents.
Ability to describe non-steroids (including mast cell stabilizers) as anti-inflammatory agents.
Ability to describe ocular effect of chemotherapeutic agents.
Ability to describe dyes as eye topical diagnostic agents,
Ability to demonstrate an understanding of dyes as oral and intravenous agents.
Ability to demonstrate an understanding of hyperosmotic agents.
Ability to describe the purpose of Lubricants and tear substitutes.
Ability to demonstrate an understanding of preparations used with contact lenses.

Course Learning Outcomes:
After finishing this course student will know how to:
1. Select appropriate ocular pharmaceutical agents for cycloplegia, mydriasis, and topical anaesthesia.
2. Describe the allergic/inflammatory response cascade and hence select appropriate pharmaceutical agents for the treatment of ocular allergy/inflammation.

3. Analyse the results of clinical examinations competently acknowledging optometric limitations.
4. Explain the factors affecting drug absorption.
5. Explain the pharmacology of common ocular diagnostics drugs.
6. Interpret the ocular effects of systemic drugs.
7. Discuss and manage patients when diagnostic drugs are indicated.

Teaching Strategies:
Online lecture, Self study

Exercises Type (Laboratory / Auditory / Clinical)
-

Exercises Content:
-

Student Obligations and Conditions:
Attendance in online lectures with active participation in online discussion.

Student Assessment Methods:
Presence in online lectures.
Activity in online lectures.
Quizzes and final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
No	Quiz 1	12	20
No	Quiz 2	12	20
No	Online Lectures Presence and Activity	6	10
No	Final Exam	30	50
	TOTAL POINTS:	60	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 180 hours (6.0 ECTS)
- Online Lectures – 60 hours (2.0 ECTS)
- Individual student work: reading the literature and preparing for the quiz and final examination – 120 hours (4.0 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	2.0	1 - 7	Discussion with students, attendance record.
STUDENTS WORK	4.0	1 - 7	Quizzes and final exam
TOTAL	**6 ECTS**		

Compulsory Literature:
1.Clinical Ocular Pharmacology. 4thedition . by Bartlett, S./Bartlett, J./Jaanus, S. (2000): Butterworth and Heinemann.

Recommended Literature:

Notices:

Update History:

Course Name: Eye Related System Pathology			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
1	3+0+0	45	5

Course Coordinator:

Course Teaching Staff:

Course Aims:
To introduce how changes on different systems in our body affect the eyes; to provide advanced knowledge about different systems, their anatomy, physiology and pathological disorders; to imbed the knowledge on how the human body works into an eye exam ; to understand basic approaches in treating different systemic disorders and diseases; to be able to communicate with patients and gather all the required information on their general health with respect to the human eye

Course Content:

Which systemic diseases most commonly affect the eye?

Advanced theoretical knowledge about vascular system and vascular disorders:
- Systemic hypertension
- Blood vessel thrombosis and embolic diseases
- Central retinal artery and vein occlusion
- Migraine
- Blood dyscrasias
- Hyperviscosity syndromes

Advanced theoretical knowledge about autoimmune disorders

- Brief review of human immune system
- Thyroid disorders (hyperthyroidism, hypothyroidism)
- Temporal arteritis
- Connective tissue disorders
- Ankylosing spondylitis
- Systemic lupus erythematosus
- Polyarteritis nodosa
- Sarcoidosis
- Myasthenia gravis
- Sjogren syndrome

Advanced theoretical knowledge about neoplastic disorders
- Pituitary gland tumors
- Metastatic carcinoma

Advanced theoretical knowledge about infectious disorder

- Acquired immunodeficiency syndrome (AIDS)

Advanced theoretical knowledge about endocrine/ metabolic disorders

- Brief review of endocrine system
- Diabetes mellitus type I and II
- Menopause

Advanced theoretical knowledge about nervous system:
- Alzheimers disease
- Parkinsons disease
- Bells palsy

Advanced theoretical knowledge about congenital disorders
- Neurofibromatosis

Advanced theoretical knowledge about idiopathic disorders

- Multiple sclerosis

Advanced theoretical knowledge about toxins and drugs

Advanced theoretical knowledge about traumatic disorders

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
- Knowledge about manifestations and mechanisms of eye related system pathology.
-Understanding of anatomy, physiology and most common pathological disorders of vascular, immune, endocrine and nervous

system.
-Fundamental knowledge needed to be able to perform a complete eye exam with respect to the human body.
-Understanding the organization of some of the systems in the human body.
-Basic theoretical knowledge on treating options for different systemic disorders and diseases.

Course Learning Outcomes:
After finishing this course student will know how to:

1. Detailed knowledge about vascular system and its effect on the human eye.
2. Detailed knowledge about immune system and its effect on the human eye.
3. Detailed knowledge about endocrine system and its effect on the human eye.
4. Detailed knowledge about infective diseases and their effect on the human eye.
5. Detailed knowledge about nervous system and its effect on the human eye.
   Detailed knowledge about neoplastic disorders, congenital and idiopathic disorders, trauma, drugs and toxins and ther effect on the human eye.

Teaching Strategies:
Online lecture

Exercises Type (Laboratory / Auditory / Clinical)
-

Exercises Content:
-

Student Obligations and Conditions:
Attendance in online lectures with active participation in online discussion.

Student Assessment Methods:
Online Lectures Presence and Activity.
Quiz and final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
Yes	Online Lectures Presence and Activity	12.5	25
No	Quiz	25	50
No	Final Exam	12.5	25
	TOTAL POINTS:	**50**	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 150 hours (5.0 ECTS)

- Online Lectures – 45 hours (1.5 ECTS).
- Individual student work: reading the literature and preparing for the quiz and final examination – 105 hours (3.5 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1.5	1-6	Online discussion with students, attendance record.
STUDENTS WORK	3.5	1-6	Quiz and Final exam
TOTAL	**5 ECTS**		

Compulsory Literature:
Kanski, J. (2016): Clinical Ophthalmology: A Systematic Approach. 8-th edition.
- Course materials on the Internet

Recommended Literature:

- Birnbaum (2008) Optometric management of nearpoint vision disorders. Optometric Extension Program Foundation 416
- Ciuffreda/Tannen (1995): Eye Movement Basics for the Clinician. Mosby.
- Dictionary of Visual Science

Notices:

Update History:

Course Name: Low Vision			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
2	3+1+0	60	6

Course Coordinator:

Course Teaching Staff:

Course Aims:
The students should demonstrate knowledge, understanding and skills, be able to discuss, explain, and manage patients whose vision cannot be improved significantly using conventional spectacles or contact lenses, in order to make the most of their residual vision, using magnifying systems and imaging technology. This course aims to provide the student with up to date knowledge in low vision care to provide a high standard of low vision care in community, optometry, for non-complex cases. Prepare the student in their clinical expertise and decision-making skills in the management of the patient with low vision with specific reference to goal setting; assessment of vision; provision of low vision aids; advice about lighting and other methods of enhancing vision; provision of information and advice; referral to other services including social services; re-appraisal of goals; and arrangement for follow up.

Course Content:
This module supports the student's professional development as a practitioner with a special interest in low vision management through analysis of current evidence-based practice and clinical guidelines.

Definitions, Epidemiology and Certification

- Definitions of low vision including visual impairment and visual disability
- Epidemiology of low vision

The impact of Visual Impairment

- Impact of low vision on visual function, the individual and community
- Assessment of visual disability
- Goal setting and prioritizing need

Low vision service provision

Connection with other professionals and services including:

- Low vision services; current services; future planning and projection
- Rehabilitation workers
- Social workers
- Ophthalmologists
- Other health care professionals
- Providers of emotional support
- Local and national voluntary organisations
- Eye clinic liaison officers
- Access to work

Refraction and Visual Function in Low Vision

- Measuring visual acuity, contrast sensitivity and functional visual fields in low vision patients
- Refraction in people with low vision

Principles of Magnification and optical low vision aids

- Definition of magnification
- How to prescribe magnification
- Basic optics of the different types of optical magnifiers
- Consideration of uses, ergonomics, dexterity, field of view, magnification ranges and spectacle requirements when prescribing magnifiers
- An awareness of aids for peripheral visual field loss

Rehabilitation Strategies and non-optical low vision aids

- Reducing glare in low vision patients
- Making things bigger and improving contrast
- Lighting: general lighting, task lighting
- Sight Substitution using sound and touch
- Braille
- Eccentric fixation and steady eye strategy

- Assistive technology and low vision, electronic low vision aids and non-optical aids

Communication

- Information on the eye condition and visual function
- Strategies and devices prescribed and their use
- Onward referral
- Review

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:

- Knowledge of the causes and epidemiology of low vision in specialist groups of patients
- Detailed knowledge of optical and non-optical devices and demonstrate an ability to prescribe a selection of these
- Understanding of the interaction of mental health and low vision
- Ability to communicate effectively with patients, carers and fellow professionals in meaningful and innovative ways
- Understanding of the legislation and guidelines underpinning low vision practice

Course Learning Outcomes:
After finishing this course student will know how to:

1. Gain comprehensive understanding of definitions of low vision and visual impairment.
2. Develop an understanding of the importance of sensory substitution, non-optical low vision devices, IT (such as kindle, mobile phones and iPad) and strategies and the provision of them.
3. Develop an understanding of the impact of low vision in the context of multiple impairments, children and an aging population.
4. Gain an in-depth understanding of how to determine magnification and experience of applying this knowledge to prescribe electronic and optical low vision devices.
5. Develop detailed knowledge of the role, contact details and communications pathways of other professions and organizations who are an essential part of multidisciplinary low vision service provision
6. Demonstrate an ability to assess people with low vision to evaluate their visual disability and establish their low vision goals/ daily needs assessment.
7. Effectively communicate with individuals, their family and careers, including: the emotional impact of sight loss, information on the eye condition and visual function, strategies and devices prescribed, their use and ongoing maintenance, onward referral, review

Teaching Strategies:
Online lecture, Exercises, Self-study

Exercises Type (Laboratory / Auditory / Clinical)
Laboratory

Exercises Content:

- Determination of magnification
- Assessment of disability, refraction and visual impairment
- Prescribing and dispensing appropriate optical devices
- Proposing appropriate sensory substitution, non-optical aids, IT and strategies
- Communicating to the patient with respect to their emotions, eye condition, devices and strategies prescribed onward referral and review

Student Obligations and Conditions:
Attendance in online lectures and exercises with active participation in online discussion.

Student Assessment Methods:
Online Lectures and Online Exercises Presence and Activity.
Face to Face Exercises Presence and Activity.
Quizzes and final exam.

Scoring Criteria:

Requirement for exam application	Crediting criteria	Minimal credits	Maximal credits
Yes	Online Lectures and Online Exercises Presence and Activity	6	10
No	Face to Face Exercises Presence and Activity	12.5	15

No	Quiz 1	12.5	25
No	Quiz 2	12.5	25
No	Final exam	13	25
	TOTAL POINTS:	**56.5**	100

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 180 hours (6 ECTS):

- Online Lectures – 45hours (1.5 ECTS).
- Exercises – 15 hours (1.0 ECTS).
  - Online Exercises – 7.5 hours (0.5 ECTS)
  - Face to Face Exercises – 7.5 hours (0.5 ECTS)
- Individual student work: reading the literature and preparing for the quiz, exercises and final examination – 105 hours (3.5 ECTS)

Constructive alignment:

TEACHING ACTIVITIES	STUDENT WORKLOAD	OUTCOMES	MONITORING METHOD / TEST
ONLINE LECTURE	1.5	1-7	Online discussion with students, attendance record
ONLINE EXERCISES	0.5	2,4,6	Online discussion with students, attendance record
FACE TO FACE EXERCISES	0.5	2,4,6,	Discussion with students, attendance record
STUDENT WORK	3.5	1-7	Quizzes and the final exam.
TOTAL	**6 ECTS**		

Compulsory Literature:

1. Jackson, A.J. and Wolffsohn, J.S. (2007) Low vision manual. 1st Edition, London, Butterworth-Heinemann.
2. Macnaughton, J. (2005) Low Vision Assessment: Eye essentials. First edition, Edinburgh, New York, Elsevier/ Butterworth-Heinemann.

Recommended Literature:

1. Brilliant, R.L. (1999) Essential Low Vision Practice. First Edition, Boston; Oxford : Butterworth-Heinemann.
2. Dickinson, C. (1998) Low Vision Principles and Practice. First Edition, Oxford: Butterworth-Heinemann.
3. Farrall, H. (1991) Optometric Management of Visual Handicap. First Edition, Oxford : Blackwell Scientific.

Notices:

Update History:

Course Name: Posterior Segment Pathology			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
2	3+3+0	90	7

Course Coordinator:

Course Teaching Staff:

Course Aims:

- to provide optometrists with knowledge and understanding of common medical retina conditions covering screening and referral with an emphasis on retina imaging techniques
- to learn to use the non-mydriatic fundus camera, widefield Scanning Laser Ophthalmocsope (SLO) and Binocular Indirect Ophthalmoccopy (BIO) to detect and document abnormalities of central and peripheral retina
- to learn fluorescein angiography (FA), optical coherence tomography (OCT) and optical coherence tomography angiography (OCTa) techniques, in order to understand and make an accurate and appropriate referral regarding diabetic retinopathy, macular pathology and optic nerve pathology ….
- to learn eye ultrasound techniques with an emphasis on vitreous and retinal pathologies, in order to understand and make accurate and appropriate referral regarding retinal detachment, posterior vitreous detachment, hematovitreous etc.
- to prepare optometrists to commence working under supervision of medical retina specialist

Course Content:

Risk factors, differential diagnosis and pathogenesis of retinal and macular pathology

- AMD (dry and wet)
- choroidal neovascularisation (CNV) in myopic eyes
- surface macular diseases (epiretinal membrane,pseudo-macular holes and macular holes, vitreomacular adhesion)
- diabetic retinopathy and maculopathy
- vascular retinal pathologies (hypertensive rethinopathy, central and branch retinal vein occlusion, central and branch retinal artery occlusion, macroaneurysms, retinal emboli)
- cystoid macular oedema
- central serous retinopathy
- macular dystrophies
- retinitis pigmentosa
- uveitis
- optic disc pit
- peripheral retinal degenerations
- retinoschisis
- posterior vitreous detachment
- retinal detachment
- benign or non-referable disorders

Current treatments of medical retina disorders including the patient's response to treatment and pertinent treatment trials

- introducing methods of antiVEGF and corticosteroid intravitreal treatment (and ongoing trials) in diabetic retinopathy, CRVO, BRVO and myopic CNV.
- photocoagulation in treatment of retinal tears and diabetic retinopathy
- current vitreoretinal surgery methods for retinal detachments, diabetic retinopathy or surface macular diseases

Communication with patients

- appropriate adaptation for individual patients
- provision of written information
- understand informed choice and its relevance to screening
- how to obtain patient consent
- referral to GP, diabetic clinic or hospital eye service
- evidence based dietary and lifestyle advice.

OCT and OCTA imaging and fundus photography:

- normal OCT and fundus image including common artefacts
- types of OCT, for example, time domain vs. spectral domain
- OCT -A
- monitoring the response to treatment over time
- drusen in macula and optic disc
- atrophic and fibrotic change
- cystoid macular edema
- sub retinal and intraretinal fluid
- CNV
- CSR
- interpretation of OCT thickness measures
- RPE tear
- vitelliform macular changes
- vitreo-macular interface disorders, for example macular holes, lamellar macular holes, pseudoholes and epiretinal

membranes
- diabetic retinopathy grades
- PVD
- criteria for gradability of images

Fundus Photography, Widefield SLO and Binocular Indirect Ophthalmoscopy (BIO)

- non-mydriatic fundus camera,
- widefield Scanning Laser Ophthalmocsope (SLO)
- Binocular Indirect Ophthalmoscopy (BIO)

Fluorescein angiography, ICG angiography and autofluorescence

- normal FA, ICG and autofluorescence image including common artifacts
- diabetic retinopathy grading
- neovascularisations
- diabetic maculopathy
- CNV
- Optic drusen

Ultrasound imaging with an emphasis on retina and vitreous

- normal US imaging including common artifacts
- PVD
- retinal detachment
- hematovitreous
- optic disc druse

Diabetic screening relevance:

- type 1, type 2 and other types of diabetes including gestational and malnutritional
- risk factors for diabetic retinopathy
- diabetes and cataract
- pregnancy and diabetic retinopathy progression
- long-term complications of diabetes.

Detecting and classifying diabetic retinal disease:

- presence or absence of diabetic retinopathy, maculopathy and other common retinal pathology
- clinical features of diabetic retinopathy and maculopathy
- diabetic retinopathy and maculopathy requiring routine or urgent referral.

Acute macular and retinal pathology detection and management:

- history for example significance of recent distortion or sudden deterioration of vision
- clinical examination, including dilated fundus assessment with slit lamp and Volk lens
- use and limitations of Amsler chart testing
- suspected subretinal neovascular membrane; signs to include but not limited to: macular haemorrhage, grey or raised lesion, exudates and evidence of fluid on OCT
- other conditions to include:
  - retinal detachments and tears
  - BRVO
  - CRVO
  - BRAO
  - CRAO
  - AION
  - management of retinal and macular pathology including non referral, routine and urgent referral.

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
Ability to be proficient, safe and accurate with equipment and in the performance of techniques.
Ability to
provide clear explanations about the purpose of different tests, what is involved in the tests and the effects of any diagnostic dru gs used.
Ability to evaluate which information carries greater weight in patient management.
Ability to assess and evaluate the conjunctiva, lids, lashes, puncta, meibomian glands, lacrimal glands, tear film, ocular surface skin lesions near the eye etc. for the purposes of screening for health, disease and ability to function.
Ability to assess and evaluate the cornea, anterior chamber and aqueous humour, anterior chamber angle, anterior chamber de pth, episclera, sclera, iris, pupil and ciliary body for the purposes of screening for health, disease and ability to function.
Ability to use techniques such as macro-observation, biomicroscopy, lid eversion, use of diagnostic dyes.
Ability to assess and evaluate the ocular lens, lens implants, the lens capsule and vitreous for the purpose of screening for healt h, disease and ability to function.
Ability to assess and evaluate the central and peripheral retina, choroid, vitreous, blood vessels, optic disc and neuro-

retinal rim, macula and fovea for the purpose of screening for health, disease and ability to function.

Course Learning Outcomes:
After finishing this course student will know how to:

1. An understanding of the risk factors and differential diagnosis of disorders of retinal and macular pathology
2. An understanding of treatments of medical retina disorders including the patient's response to treatment
3. An ability to interpret OCT and OCTA images and fundus photographs for AMD and diabetic retinopathy, with appropriate patient management under the supervision of medical retina specialist
4. An awareness of the use of fluorescein, ICG angiography and autofluorescence in medical retina service delivery
5. An ability to detect and classify diabetic retinal disease
6. An ability to recognise acute retinal pathology, conduct appropriate tests and make appropriate referrals, clearly stating the level of urgency
7. An awareness of the rapidly evolving nature of medical retina treatments including pertinent treatment trials
8. An understanding of current guidelines for management of medical retina disorders

Teaching Strategies:
Online Lecture, Laboratory, Self study

Exercises Type (Laboratory / Auditory / Clinical)
Laboratory and Clinical exercises, interactive seminars and imaging interpretation tests

Exercises Content:
Practical exercises consist of eye and adnexa exams using the optometric laboratory equipment, OCT, OCTA and US imaging

Student Obligations and Conditions:
Regular attendance of online lectures and face to face exercises.
Teaching activity by tracking lecture content, performing tasks, and participating in discussions on the results of the exercises.
Regularity and execution of exercise tasks.

Student Assessment Methods:
Online Lectures and Online Exercises Presence and Activity
Face to Face Exercises Presence and Activity
Quiz, Final Report and Final Exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
No	Online Lectures and Online Exercises Presence and Activity	**5**	**10**
No	Qiuz 1	10	20
No	Quiz 2	10	20
No	Face to Face Exercises Presence and Activity	8	10
Yes	Case report	7,5	15
No	Final Exam	12,5	25
	TOTAL POINTS:	48	100

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 210 hours (7 ECTS)

- Online Lectures – 45 hours (1,50 ECTS).
- Exercises – 45 hours (1.50 ECTS).
  - Online Exercises - 15 hours (0.50 ECTS)
  - Face to Face Exercises - 30 hours (1.00 ECTS)

Individual student work: preparing for the quizzes and exercises, reading the literature – 120 hours (4,00 ECTS)).

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1.5	1-8	Discussion with students, attendance record.
FACE TO FACE EXERCISES	1.0	1-7	Discussion with students, control of acquired knowledge in exercises.
ONLINE EXERCISES	0.5	1-7	Online discussion with students, control of acquired

			knowledge in exercises.
STUDENTS WORK	4.0	1-7	Case report, Quiz and final exam
TOTAL	**7 ECTS**		
Compulsory Literature:			
Recommended Literature:			
Notices:			
Update History:			

Course Name: Refractive Surgery			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
2	3+3+0	90	6

Course Coordinator:

Course Teaching Staff:

Course Aims:
To introduce the role optometrist in refractive surgery; to provide advanced knowledge about different types of refractive surgery methods; to be able to perform all pre-surgery evaluations and examinations; to understand post-surgery treatment and possible complications; to be able to communicate with patients and explain the procedure to them

Course Content:
ntroduction to refractive surgery

Basic theoretical knowledge about the following topics:
- What is refractive surgery
- History of refractive surgery

Different refractive surgery methods

Corneal refractive surgery methods

Advanced theoretical knowledge about corneal biomechanics, morphological response, laser technology applied to the cornea and different surgical techniques

- PRK - photorefractive keratectomy
- LASIK - laser assisted in situ keratomileusis with Microkeratome System
- iLASIK - laser assisted in situ keratomileusis with Femtosecond Laser System
- SMILE - small incision lenticule extraction

Intraocular lens refractive surgery methods

Advanced theoretical knowledge about different surgical techniques, indications and results:

- Phacic intraocular lens implants
- CLE - clear lens extraction with multifocal intraocular lens implantation

Pre-surgery evaluations
Observation, inspection, recognition of signs, and techniques and skills including:
- Preexamination interview with the patient to gather all required information and to inform patient about benefits and risks of available refractive procedures
- Usage of different diagnostic tools in pre-surgery evaluations (aberrometer, refractometer, corneal topographer, pentacam, a-scan and IOL master, specular microscope)
- Influence of measured refraction on the outcome of the procedure
- Influence of intraocular pressure on the outcome of the procedure
- Biomicroscopy skills obtained on other courses will be put into context for presurgery evaluation
- Influence of corneal tomography, pachymetry and keratography on the outcome of the procedure
- Ability to explain to the patient if he is a good candidate for the surgery

Post-surgery treatment
Observation, inspection, recognition of signs, and techniques and skills including:
- To be able to perform regular follow-ups after the procedure
- Understanding of possible post-surgery complications
- To be able to provide solutions if any complications happen

Eye drops knowledge obtained on other courses will be put into context regarding post-surgery treatment

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
- Ability to demonstrate knowledge in biology and biomechanics of corneal and lens refractive surgery.
- Ability to recognize absolute and relative ocular and general health contraindications
- The ability to perform a complete pre-surgery evaluation.
- The ability to inform and educate patient about: realistic expectations, alternative corrections, normal symptoms and side effects, risk for complications, presbyopia and postoperative eye care
- Knowledge about diagnostic tools used in pre-surgery evaluation.
- The ability to identify which patients are good candidates for refractive surgery.
- Detailed knowledge about different methods of refractive surgery and potential post-surgery complications.
- Ability to recognise and manage postoperative complications in optometry domain.

Course Learning Outcomes:
After finishing this course student will know how to:
1. Detailed knowledge about different refractive surgery methods.
2. Identify which patients are good candidates for refractive surgery.

3. Assess which methods are recommended for that patient based on gathered information.
4. Assess the impact of obtained individual factors on the outcome of the surgery.
5. Knowledge about post-surgery treatment and possible complications.

Teaching Strategies:
Online Lecture

Exercises Type (Laboratory / Auditory / Clinical)
Clinical exercises

Exercises Content:
Each student will have to individually perform and interpret all techniques required for the complete preoperative refractive patient evaluation. Each student will have to do a 5-10min “Case Report” power point presentation - they will be given all the information on their fictional patients and they will have to determine which refractive surgery method or methods would be the best option.

Practical Work:
-

Student Obligations and Conditions:
Regular attendance of online lectures and clinical exercises.
Teaching activity by tracking online lecture content, performing tasks, and participating in discussions on the results of the exercises.
Regularity and execution of exercise tasks.

Student Assessment Methods:
Presence and activity in online lectures and face to face exercises.
Case report.
Final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
No	Online Lectures Presence and Activity	12,5	25
No	Face to Face Exercises Presence and Activity	15	25
Yes	Case Report	10	25
No	Final Exam	12,5	25
	TOTAL POINTS:	50	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 180 hours (6 ECTS)
- Online Lectures – 30 hours (1.0 ECTS).
- Face to Face Exercises - 15 hours (0.5 ECTS)
- Individual student work: preparing for the quizzes and exercises, reading the literature – 135 hours (4,50 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1.5	1-5	Discussion with students, attendance record.
FACE TO FACE EXERCISES	0.5	1-5	Discussion with students, control of acquired knowledge in exercises.
STUDENTS WORK	4.0	1-5	Case report, Quiz and final exam
TOTAL	**6 ECTS**		

Compulsory Literature:

- Sinjab, MM. (2012) Corneal topography an Clinical practice (Pentacam System) - Basic and Clinical interpretation. Jaypee Brothers Medical Publishers (P) Ltd
- Garg A, Alio JL. (2010) Surgical Techniques in Ophtalmology Refractive Surgery . Jaypee-Highlights Medical Publishers, In Kanski, J. (2016): Clinical Ophthalmology: A Systematic Approach. 8-th edition.
- Course materials on the Internet:
    - American Academy of Ophthalmology. Refractive Management/Intervention Panel. Preferred Practice Pattern® Guidelines. Refractive Errors & Refractive Surgery. San Francisco, CA: American Academy

of Ophthalmology; 2013. Available on: o http://www.aao.org/ppp.
Recommended Literature:
Notices:
Update History:

Course Name: Special Cotact Lenses			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
2	2+2+0	60	6

Course Coordinator:

Course Teaching Staff:

Course Aims:
The design and fitting of rigid and hydrogel contact lenses in cases of high and/or irregular astigmatism and/or increased corneal higher order aberrations. Design and fitting of contact lenses for patients with keratoconus, keratoglobus or pellucid marginal degeneration. Strategies for the use of contact lenses on infants and the pediatric population. The use of advanced technology such as computerized corneal topography and wave front analysis in contact lens fitting. The use of corneal refractive therapy and orthokeratology in myopia treatment. Advanced fitting of contact lenses on the post-refractive surgery and diseased cornea. Fitting of therapeutic bandage or other therapeutic contact lenses for sustained drug release or for corneal surface disease to include superficial corneal disease/trauma to include corneal abrasion, recurrent corneal erosion, or epithelial basement membrane dystrophy. Special considerations for the fitting of contact lenses on the geriatric population.

Course Content:

- Introduction to keratoconus
- Clinical applications of corneal topography
- Children and CLs
- Myopia control
- CL related infiltrative and inflammatory complications
- Modern CL materials
- SOAP- trouble managements
- Specially designed lenses and fitting procedures for :
  - Keratoconus
  - Irregular corneas , Fitting on scars, fitting directly after refractiv surgery, fitting directly after Keratoplastic
  - Cornea-scleral and hybrid lenses
  - Limbus-Near-Lenses
  - Semi-Scleral-Lenses
  - Mini-Scleral-Lenses
  - Scleral-Lenses
  - Post keratoplasty CL fitting
  - Fitting of multifokal Keratocone and Keratoplastic lenses
  - Post refractive surgeries
  - Cosmetic (prosthetic) use
  - Iris colour changes, soft Iris painted lenses, Scleral Lenses with Iris print
  - (Irregular Cornea) - Contact lens fitting on the oblong Cornea
  - Orthokeratology
  - Toric Orthokeratology
  - Multifocal Keratology
  - Myopia control, multifocal lenses, peripher defocus, quadrantic specific defocus, Orthokeratology for children
  - Theraupetic

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:

- Demonstrate advanced knowledge of the broad concepts of fitting CLs in keratoconics, aphakes, patients requiring medical cosmetic lenses and sclerals
- Provide a detailed explanation of and differentiate between the aspects of microbiology and immunology relevant to the in-eye situation
- Gain an in-depth and systematic understanding of the process of infection and inflammation related to CL wear
- Show an in-depth understanding of the ocular pathological processes that would benefit from contact lens wear
- Demonstrate a comprehensive understanding of the concepts of fitting contact lenses in patients requiring therapeutic lenses, those with dry eye, high prescriptions and following surgical procedures.

Course Learning Outcomes:
After finishing this course student will know how to:

1. Analyse the implications of fitting complex contact lens designs
2. Fit therapeutic lenses
3. Fit specially designed lenses and apply special fitting procedures
4. Apply fitting procedures for myopia control
5. Apply fitting procedures for orthokeratology
6. Apply prosthetic contact lenses

Teaching Strategies:
Online Lecture, Exercises, Self study

Exercises Type (Laboratory / Auditory / Clinical)
Laboratory and Clinical exercises

Exercises Content:
Practical exercises of contact lens fitting

Practical Work:
Fit therapeutic lenses, Fit specially designed lenses and apply special fitting procedures

Student Obligations and Conditions:
Regular attendance of online lectures and exercises.
Teaching activity by tracking lecture content, performing tasks, and participating in discussions on the results of the exercises.
Regularity and execution of exercise tasks.

Student Assessment Methods:
Presenceand activity in online lectures.
Quiz and Final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
No	Online Lectures Presence and Activity	12,5	25
No	Quiz	12,5	25
Yes	Face to Face Exercises Presence and Activity	10	25
No	Final Exam	12,5	25
	TOTAL POINTS:	**47.5**	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
Anterior and posterior patology

Student Workload Assessment:
Total of 180 hours (6,00 ECTS)

- Online Lectures – 30 hours (1,00 ECTS).
- Face to Face Exercises – 30 hours (1,00 ECTS)
- Individual student work: preparing for the quizzes, exercises and final exam, reading the literature – 120 hours (4,00 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1.0	1-6	Online discussion with students, attendance record.
FACE TO FACE EXERCISES	1.0	1-6	Discussion with students, control of acquired knowledge in exercises.
STUDENTS WORK	4.0	1-6	Case report, Quiz and final exam
TOTAL	**6 ECTS**		

Compulsory Literature:
Contact lens complication, Fourth Edition, N.Efron, 2019, Contact Lens Practice, N.Efron, 2016

Recommended Literature:

Notices:

Update History:

Course Name: Vision Therapy			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
2	2+2+0	60	5

Course Coordinator:

Course Teaching Staff:

Course Aims:
To demonstrate in depth theoretical and practical knowledge in managing patients who suffer from binocular vision problems or are at risk of developing them. To understand motor components of binocular vision. To introduce different aspects of vision therapy in optometric practice. To have in depth knowledge about accommodative and vergence dysfunction. Advanced knowledge about vision therapy programs and methods. To understand vision related learning problems and introduce the role of optometrist in designing a therapy program.

Course Content:

Introduction / Treatment Options:
- Role of intraocular and extraocular muscles in binocular vision and eye motility
- Relationship between pupillary changes - accommodation - convergence
- Reflex and compensatory eye movements
- Version versus vergence eye movements
- Vision Therapy (in-office and home program)
- Medical treatment options
- Surgical procedures
- 21 steps - Clinical refractive procedures

Diagnosis and management options for accommodative dysfunction:
- Accommodation insufficiency
- Accommodation Excess
- Ill-Sustained Accommodation
- Accommodative Infacility
- Paralysis of Accommodation
- Spasm of Accommodation

Diagnosis and management options for vergence dysfunction:
- Convergence Insufficiency
- Convergence Excess
- Divergence Insufficiency
- Divergence Excess
- Basic Exophoria
- Basic Esophoria
- Fusional Vergence Dysfunction
- Vertical Heterophorias

VISION RELATED LEARNING PROBLEMS

Introduction to vision and learning correlation:
- Normal child development
- Vision efficiency and visual processing development
- Learning disabilities / special populations
- Visual attention and reading
- Visual perceptual / efficiency problems and learning

Learning-related vision problems
- Refractive vision problems
- Eye coordination problems
- Eye focusing problems
- Eye tracking problems
- Faulty visual form perception
- Faulty visual memory
- Faulty visual motor integration
- Difficulty with laterality and directionality

Optometric assessment
- Case history
- Visual efficiency problems
- Evaluation / recognition or vision related learning problems
- Visual information processing problems

Treatment of learning-related vision problems
- Management plan
- Vision therapy procedures for developmental visual information processing problems
- Interdisciplinary management of learning problems

General and Specific Competencies (knowledge, understanding, skills and abilities):

After finishing this course student will have:
- Knowledge about normal versus abnormal binocular vision conditions.
- Understanding different approaches on assessing binocular vision status.
- In depth knowledge in designing a proper vision therapy program.
- In depth knowledge about equipment used in vision therapy programs.

- Understanding how vision can affect learning in children and how to design an improvement plan.

Course Learning Outcomes:
After finishing this course student will know how to:

1. In depth theoretical and practical knowledge about binocular vision disorders.
2. Identify and differentiate between different factors that cause binocular vision disorders.
3. Understanding how to properly assess binocular vision functionality.
4. Detailed knowledge about designing a vision therapy program.
5. Identify vision related learning problems and design an improvement plan.
6. Examination of motor and sensory system for preschool children, school-age children and adults.

Teaching Strategies:
Online lecture, Exercises, Self study

Exercises Type (Laboratory / Auditory / Clinical)
Online auditorial exercises, Laboratory

Exercises Content:
Accommodation tests, vergence tests, 21 step methology, focusing and tracking tests, visual perception and memory tests

Student Obligations and Conditions:
Attendance in online lectures and exercises with active participation.
Regularity and execution of exercise tasks.

Student Assessment Methods:
Online Lectures and Online Exercises Presence and Activity.
Face to Face Exercises Presence and Activity
Quiz and final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
Yes	Online Lectures and Online Exercises Presence and Activity	16	20
Yes	Face to Face Exercises Presence and Activity	16	20
No	Quiz	17.5	35
No	Final Exam	12.5	25
	TOTAL POINTS:	**62**	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 150 hours (5 ECTS)

- Online Lectures – 30 hours (1.0 ECTS)
- Exercises – 30 hours (1.0 ECTS):
  - Online Exercises - 15 hours (0.5 ECTS)
  - Face to Face Exercises - 15 hours (0.5 ECTS)

Individual student work: reading the literature and preparing for the quiz, exercises and final examination – 90 hours (3.0 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1.0	1-6	Online discussion with students, attendance record.
ONLINE EXERCISES	0.5	1-6	Online discussion with students, attendance record.
FACE TO FACE EXERCISES	0.5	1-6	Discussion with students, attendance record.
STUDENTS WORK	3.0	1-6	Final exam
TOTAL	**5 ECTS**		

Compulsory Literature:

1.Jack Kanski, J. (2016): Clinical Ophthalmology: A Systematic Approach. 8-th edition.

2.Course materials on the Internet
- Handouts

Recommended Literature:
Notices:
Update History:

Course Name: Glaucoma and other Neurological Disorders of the Visual System			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
2	3+2+0	75	7

Course Coordinator:

Course Teaching Staff:

Course Aims:

In this course, student will discover the organization of the human visual system, anatomy and physiology of the afferent visual pathway. To introduce students to glaucoma and importance of glaucoma screening; to understand glaucoma pathology and changes that occur on the optic nerve and retina; to be able to differentiate between open angle and closed angle glaucoma; to understand different therapeutic solutions for different types of glaucoma; to provide advanced knowledge and practical skills regarding different diagnostic procedures in glaucoma; to understand principles and techniques of examination, transient visual loss and questions of anisocoria and prechiasmal visual loss.

Course Content:

INTRODUCTION

- **Anatomy and Physiology of the Afferent and Efferent Visual Pathway**
  - General anatomy, Optic Nerve Blood Supply, Optic Nerve Axons
  - Optic chiasm: Gross anatomy, Organization of Nerve Fibers within the Optic Chiasm
  - Optic tract:
    - Lateral Geniculate Nucleus: Anatomy, physiology and functional organization
    - Postgenicualte visual sensory pathways: Anatomy
    - Cortical Visual Areas
  - Congenital optic nerve abnormalities: common disorders, prognosis, short and long term complications,
  - Acquired optic nerve abnormalities: optic nerve swelling, typical findings, optic disc drusen / burried drusen
  - Pupils: Anatomy, Physiology, Parasympathetic control, Sympathetic control

GLAUCOMA

- **Introduction to glaucoma, primary glaucoma:**
  - Definition, diagnosis, risk factors,
- **Differentiate between ocular hypertension and glaucoma**
- **Symptoms, manifestation, treatment options for:**
  - POAG
  - PEX
  - Angle closure glaucoma
  - Acute angle closure glaucoma
  - Neovascular glaucoma
  - Other types
- **Principles of screening methodologies used in detection of glaucoma and how effective diagnostic tests are in terms of sensitivity, specificity and predictive power:**
  - Measurement of IOP on different devices and relationship of intraocular pressure to central corneal thickness.
  - Theoretical and practical principles of visual field testing on different devices
  - OCT vs HRT
- **Anterior segment assessment in glaucoma screening:**
  - Slit-lamp examination of anatomical features clinically related to glaucoma
  - Gonioscopy
  - Anterior segment OCT
  - UBM
- **Posterior segment assessment in glaucoma screening:**
  - Anatomical features of normal and glaucomatous optic nerve head appearances
  - Role of OCT-ONH analysis in evaluation of progression of glaucoma
  - Importance of non ONH findings in glaucoma
- **Pharmacological principles for the treatment of glaucoma:**
  - Methodologies for reducing intraocular pressure using pharmacological agents
  - Mode of action and effectiveness
  - Combination therapies
- **Laser treatments for glaucoma, theoretical knowledge about:**
  - SLT
  - ALT
  - YAG laser iridotomy
- **Surgical treatments for glaucoma, theoretical knowledge about:**
  - TTE
  - glaucoma shunt
  - XEN , MIGS (microinvasive glaucoma surgery)
  - Trabeculectomy
- **Lifestyle and social aspects of glaucoma:**
  - How glaucoma affects patients in terms of vision and everyday tasks

- Inter-professional aspects relating to social care
- the implications of blind and partial sight registration.

- **Clinical case scenarios. Examples of glaucoma cases will be illustrated for discussion.**

OTHER NEUROLOGICAL DISORDERS

- **Principles and Techniques of the Examination of the Visual Sensory System:**
  - Patient history: Refraction and Visual Acquity, Steroacquity, Fundus Examination
  - Additional tests to consider: Color Vision, Contrast Sensitivity, Brightness Comparison, Visual Field Examination, Photo Stress Test, Pulfrich Phenomenon, Pupillar Examination, Dark Adaptation
  - Electrophysiological tests: ERG (electroretinogram), VEP (visual evoked potential), EOG (elecrroculogram)
- **Transistent Visual Loss (TVL)**
  - Mechanism of TVL : occlusion (thromboembolism, vasospasm, compression)
- **Anisocoria and Abnormal Pupillary Light reactions**
  - A decision tree approach in evaluation of anisocoria
- **Prechiasmal Visual Loss**
  - A decision tree approach in management of optic neuritis (ON)
  - Typical clinical features of ON (multiple sclerosis and other systemic diseases).
  - Ischemic optic neuropathy: nonarteritic, arteritic
  - Other forms of optic nerve neuropathy

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
Understanding and describe basic Anatomy and Physiology of the Afferent Visual Pathway
Ability to demonstrate knowledge about different types of glaucoma.
Ability to perform diagnostic procedures – tonometry, pachymetry, perimetry and OCT analysis
Ability to inform and educate patient about importance of regular check-ups, importance of compliance, realistic expectations and everyday challenges.
Explain principles and examination techniques in visual pathway disorders.

Course Learning Outcomes:
After finishing this course student will know how to:
1. To describe and analyse optic nerve head and visual pathway.
2. Differentiate between different glaucoma subtypes and the importance of prevelance, risk factors and management.
3. To perform and interpret glaucoma screening procedures (tonometry, gonioscopy, pachimetry, perimetry, OCT-ONH, anterior segment OCT, slit-lamp examination).
4. To explain current therapeutic (pharmacological, laser, surgical) options in management of different glaucoma subtypes.
5. To educate glaucoma patients about the importance of regular check-ups and everyday challenges in dealing with the disease.
6. To evaluate anisocoria.
7. To describe different tests used in analyzing pupils and visual pathway
8. To understand mechanism of transistent visual loss, optic neuritis and other forms of optic neuropathy.

Teaching Strategies:
Online Lectures, Online and Face to Face Exercises, Self-study

Exercises Type (Laboratory / Auditory / Clinical)
Online Auditory Exercises, Clinical exercises, Laboratory

Exercises Content:
Slit lamp biomicroscopy (anterior and posterior segment), IOP measurement (contact and noncontact), pachymetry, gonioscopy (differentiate structures in iridocorneal angle), anterior segment OCT, OCT- ONH analysis, visual field defects analysis (computerized and manual perimetry), case reports, Contrast sensitivity test (Pelli Robson test), photo stress test – RAPD

Practical Work: -

Student Obligations and Conditions:
Attendance in online lectures and exercises with active participation.
Regularity and execution of exercise tasks.

Student Assessment Methods:
Online Lectures and Online Exercises Presence and Activity.
Face to Face Exercises Presence and Activity
Quiz, case report and final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
No	Online Lectures and Exercises Presence and Activity	12.5	15
Yes	Face to Face Exercises Presence and Activity	15	20
Yes	Quiz 1	10	20
Yes	Quiz 2	10	20
No	Final Exam	12.5	25

TOTAL POINTS: 60	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook.

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 210 hours (7 ECTS):

- Online Lectures - 45 hours (1.5 ECTS)
- Online Exercises - 15 hours (0.5 ECTS)
- Face to Face Exercises - 15 hours (0.5 ECTS)
- Individual student work: preparing the case report, reading the literature and preparing for the quiz, exercises and final examination – 135 hours (4.5 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1.5	1-8	Online discussion with students, attendance record.
EXERCISES	1.0	1-8	Discussion with students, attendance record.
STUDENTS WORK	4.5	1-8	Quiz and final exam
TOTAL	**7 ECTS**		

Compulsory Literature:
Jack Kanski, J. (2016): Clinical Ophthalmology: A Systematic Approach. 8-th edition.

Recommended Literature:
J. Flammer (2001) - Glaucoma: A Guide for Patients, An Introduction for Care Providers, A Quick Reference. Published by H&H.
N. Bagheri MD (2016): The Wills Eye Manual. Published by LWW.
L. Racette (2017) Visual Field Digest: A guide to perimetry and the Octopus perimeter. Published by Haag-Streit.

Notices:

Update History:

Course Name: Visual perception and Cognition			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
3	2+2+0	60	6

Course Coordinator:

Course Teaching Staff:

Course Aims:
In this course students should demonstrate knowledge and understanding of the basic principles of human information processing, the elements of visual perception and their role in forming a complex visual experience. Also students should master basic principles of psychophysical measurements and understand their role in optometry.

Course Content:

- Introduction to visual cognition and human information processing
- Perception theories
- Light and color perception.
- Form perception and gestalt principles
- Perceptual constancy
- Depth perception and 3D vision
- Perception of objects and scenes
- Perception of movement and perception while moving
- Perceptional inference
- The binding problem.
- Basic Psychophysical Methods and Theory

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:

- The ability to explain the main perception theoretical approaches.
- The ability to Identify the basic visual perception elements
- The ability to understand the role of experience in forming a visual perception.
- The ability to differentiate the quality of visual experience produced by perception processes from the quality of the sensory information received with receptors.
  The ability to conduct basic psychophysical measurement procedures

Course Learning Outcomes:
After finishing this course student will know how to:

1. Explain the main perception theoretical approaches.
2. Identify the basic visual perception elements
3. Understand the role of experience in forming a visual perception.
4. Differentiate the quality of visual experience produced by perception processes from the quality of the sensory information received with receptors.
5. Conduct basic psychophysical measurement procedures.

Teaching Strategies:
Online lecture, Exercises, Self study

Exercises Type (Laboratory / Auditory / Clinical)
Laboratory and Auditory

Exercises Content:
Each is lesson is accompanied by appropriated demonstration for example measuring of expression of visual illusion, perceptual constancy, absolute and differential threshold using the basic psychophysical methods.

Student Obligations and Conditions:
Presence in online lectures and exercises. Activity in online lectures and exercises.
Performing tasks, and participating in discussions on the results of the exercises.

Student Assessment Methods:
Presence in online lectures and exercises.
Activity in lectures and exercises.
Quizzes and final research work.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
No	Quiz 1	13	20
No	Quiz 2	13	20

No	Face to Face Exercises Presence and Activity	6	10
No	Online Lectures and Presence and Activity	6	10
Yes	Practical (skills) assessment	10	15
No	Final exam	13	25
	TOTAL POINTS:	**61**	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:

Student Workload Assessment:
Total of 180 hours (6 ECTS)

- Online Lectures – 30 hours (1 ECTS).
- Face to Face Exercises – 30 hours (1 ECTS).
- Individual student work: preparing for the quizzes and exercises, reading the literature – 120 hours (4 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1	1-5	Online discussion with students, attendance record. Quiz
FACE TO FACE EXERCISES	1.0	1-5	Control of acquired knowledge in face to face exercises.
STUDENTS WORK	4.0	1-5	Research work, Quizzes
TOTAL	**6 ECTS**		

Compulsory Literature:
Godstein, E.B. & Brockmole, J.R. (2017) Sensation & perception, 10th edition. Boston: Cengage Learning

Recommended Literature:
Visual Perception: A Clinical Orientation, Fourth Edition 4th Edition by Steven Schwartz (Author)

Notices:

Update History:

Course Name: Research Methods			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
3	1+2+1	60	6

Course Coordinator:
Mirela Karabatić

Course Teaching Staff:

Course Aims:
To illustrate the importance of measurement and decision making in visual science; to introduce statistical methods of analysis and their application; to understand research ethics and principles involved in conception, design, conduct and completion of research projects; to be able to choosing and using appropriate statistical tools; to be able to refer to journal papers and literature and to be able to provide appropriate resources for conception, design, conduct and completion of research projects.

Course Content:
Theoretical knowledge about:
- Reference journal papers and literature: locating, critiquing, citing, reviewing and referencing
- Structuring a literature review
- Principles involved in conception, design, conduct and completion of research projects
- Research ethics

Knowledge about:
- Generating hypotheses
- Research designs
- Choosing and using appropriate statistical tools
- Interpreting and reporting statistical test results

Knowledge about quantitative research:
- The nature of quantitative research; Sampling (in quantitative research); Quantitative data analysis

Knowledge about qualitative research:
- The nature of qualitative research
- Sampling in qualitative research; Interviewing, language in qualitative research
- Qualitative data analysis

Parametric and non-parametric test:
- Student's T test; Wilcoxon test; Mann-Whitney tests; Krustal Wallis test; Chi-square test
- Definition of power; one and two-tailed tests; concept of p values

Control groups; placebo effect; longitudinal vs. cross-sectional, validity and reliability of data; repeated measures; Population and random samples; sampling methods; random, systematic and stratified sampling

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
Knowledge about how to structure a literature review. Understanding of ethical issues in research.
Fundamental knowledge needed to be able to design, conduct and completion of research projects.
Understanding the organization and developing skills for project work.

Course Learning Outcomes:
After finishing this course student will know how to:
1. Structuring a literature review
2. Generating hypotheses
3. Design, conduct and completion of research projects
4. Sampling in quantitative and qualitative research
5. Choosing and using appropriate statistical tools
6. Assess the usefulness of tests and procedures, using the results of statistical analysis.

Teaching Strategies:
Online lecture, Exercises, Self study

Exercises Type (Laboratory / Auditory / Clinical)
Online auditorial exercises, Each topic will be introduced with examples from published research papers

Exercises Content:
All homework assignments will expose learner to hands-on data analysis using datasets.

Student Obligations and Conditions:
Presence in online lectures and exercises. Activity in online lectures and exercises.
Performing tasks, and participating in discussions on the results of the exercises.

Student Assessment Methods:
Presence in online lectures and exercises.
Activity in lectures and exercises.
Quizzes and final research work.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
No	Quiz 1	0	15
No	Quiz 2	0	15
Yes	Online Lectures and Exercises Presence and Activity	10	20
Yes	Final work (research work)	30	50
	TOTAL POINTS:	40	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
Statistics (on first level)

Student Workload Assessment:

- Total of 180 hours (6 ECTS):
- Online Lectures – 30 hours (1 ECTS).
- Online Exercises – 60 hours (2 ECTS)
- Face to Face Exercises – 15 hours (0.5 ECTS)
- Individual student work (research work) and reading the literature and preparing for the research work, exercises and final examination – 75 hours (2.5 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1	1, 2, 3, 4	Online discussion with students, attendance record. Quiz
ONLINE EXERCISES	2.0	4,5	Control of acquired knowledge in online exercises.
FACE TO FACE EXERCISES	0.5	4,5	Control of acquired knowledge in face to face exercises.
STUDENTS WORK	2.5	1 - 6	Research work, Quizzes
TOTAL	**6 ECTS**		

Compulsory Literature:
Bowling, A. (2014) Research Methods In Health: Investigating Health And Health Services. Open University Press.
Clugh, P., Nutbrown, C. (2012) A Student's Guide to Methodology. SAGE Publications Ltd.

Recommended Literature:
Polgar, S., Tomas, S. A., (2013), Introduction to Research in the Health Sciences, Elsevier Ltd.
Moher, D., Altman, D. G., Schulz, K.F., Simera, I. Wager, E. (2014), Guidelines for Reporting Health Research, a user's manual. John Wiley & Sons, Chichester, West Sussex.
Hicks, C.M, Research Methods for Clinical Therapists, Applied project design and analysis. (2009), Churchill Livingstone, Elsevier.

Notices:

Update History:

Course Name: Clinical Practice I.			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
3			

Course Coordinator:

Course Teaching Staff:

Course Aims:
Knowledge of application all the procedures in optometry clinic and know how to select and use only necessary procedures.

Course Content:
Protocol for demonstration of student's optometric knowledge and skills:
Chief complaint: Reason for patient's request for eye examination.
Signs and symptoms as described by patient
Additional information about the patient's complaints
Additional information for contact lens or spectacle follow-up
Refractive history: History of patient wearing glasses, contact lenses (solutions used), etc.
Ocular history: Patient's problems in the past, possible past or present medical or surgical treatments and additional information of the treatment if present
Systemic history: Pertinent information about systemic disease such as diabetes, hypertension, thyroid disease, etc.
Medication use: Patient's usage of medication (possibility of side effects), type and frequency of usage, compliance of medication, including possible rewetting-drops for ocular problems.
Family history: Any similar problems in the family
Differential diagnosis:
Based on the obtained information provided by the patient during history taking, student should be able to provide at least two (2) diagnoses which could be the cause of the patient's complaints. Ruling in or out the conditions during examination, based on the differential diagnoses building of examination strategy.
Clinical information collection:
List the tests and the test results you performed to evaluate the patient. These should include examination of the anterior and posterior segments of the eye, cover test, ocular motility, objective and subjective refraction and any other tests as required, supporting photographs, printouts, visual fields, details of diagnostic drugs used etc. Indicate whether test results are outside normal limits and whether findings are different from what you would expect considering age, gender, appearance etc.
Pictorial evidence: Including drawings, diagrams, visual field plots and photographs in the record is recommended. If a photo slit-lamp is not available it is possible to take reasonable quality photographs of the external eye with a normal digital camera or a smartphone. Sometimes photographing through the slit lamp eye piece can give adequate results.
Tentative diagnoses:
Providing a list of possible diagnoses. Reflecting on refractive problems, ocular disease primary or secondary to systemic disease, systemic diseases that potentially could cause the current or future ocular problems.
Management plan:
Each diagnosis should go along with a plan that you make on how to approach or solve the patient's problems. The plan should contain pertinent information on

- Student clinical judgment (i.e. situation stable, better, worse)
- Possible other tests needed to be performed to determine definite diagnosis
- Student advice and explanation to the patient
- Possible referral of the patient, to other specialists and for specific timeframe
- Possible referral of the patient for a follow-up with specification of the time
- Appropriate refractive correction must be determined
- Type of refractive correction dispensing (spectacles or contact lenses)
- Specification of spectacles lenses and frame or contact lenses.
- Instructions for wear

Discussion:
A brief discussion of each of student's cases should be provided with respect of the problems student encountered. Description of the thinking process of coming up with the differential diagnosis after history. Description of methods student used to come to the final diagnosis and reasons for further referral of the patient or absence of referral. Refractive correction should be justified by the student. Reason and timeframe of patient's follow-up referral.

The requirement of this module is that the student presents twenty detailed case records that demonstrate experience of the range of optometric practice.
Primary care eye examination procedures and records – All the procedures and records should cover a complete eye examination, starting with a summary of the history, any previous treatment. Twenty (20) patients should include four (4) with binocular vision anomalies.

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
Ability to communicate with the patient and make general observations of the patient.
Ability to obtain the anamnesis and interpret patient information from other professionals.
Ability to evaluate the patient.
Ability to formulate and implement an examination plan.
Ability to assess the ocular adnexae and the eye.
Ability to assess central and peripheral sensory visual function and the integrity of the visual pathways.
Ability to assess refractive status.

Ability to assess oculomotor and binocular function.
Ability to assess visual information processing.
Ability to assess the significance of signs and symptoms found incidental to the ocular examination in relation to the patient's eye and/or general health.
Ability to interpret and analyze findings to establish a diagnosis or diagnoses.
Ability to ensure that optometric knowledge, clinical expertise and equipment remain current.
Ability to practice without the need for supervision.
Ability to provide advice and information to patients and others.
Ability to utilize resources from optometry and other organizations to enhance patient care.
Ability to understand the principles of the planning, establishment, development and maintenance of an optometric practice.
Ability to understand the legal obligations involved in optometric practice.
Ability to provide for the care of patients with special needs.
Ability to ensure emergency optometric care is available.
Ability to design a management plan for each patient and implements the plan agreed to with the patient.
Ability to manage patients requiring vision therapy.
Ability to refer the patient with ocular injury and in disease suspect.

Course Learning Outcomes:
After finishing this course student will know how to:

1. Formulate and implement an examination plan.
2. Apply the rules of business ethics in relation to client's and associates
3. Assess the ocular adnexa of the eye, obtain the refractive status, oculomotor and binocular function.
4. Interpret and analyse findings to establish a diagnosis or diagnoses.
5. Ensure that optometric knowledge, clinical expertise and equipment remain current.
6. Provide for the care of patients with special needs.
7. Design a management plan for each patient and implements the plan agreed to with the patient.
8. Refer the patient with ocular injury and in disease suspect.
9. Ensure that data is organized in a legible, secure, accessible and permanent manner.

Teaching Strategies:
Laboratory, Clinic, Self study

Exercises Type (Laboratory / Auditory / Clinical)
Laboratory and clinical

Exercises Content:
Protocol for demonstration of student optometric knowledge and skills:
History and Symptoms (Anamnesis); Chief complaint; Refractive history; Ocular history; Systemic history; Medication use; Family history; Differential diagnosis; Clinical information collection; Pictorial, photo or video evidence; Tentative Diagnoses; Management Plan; A brief discussion of each of student's cases should be provided;
The requirement of this module is that the student presents twenty detailed case records that demonstrate experience of the range of optometric practice.
Primary care eye examination procedures and records – All the procedures and records should cover a complete eye examination, starting with a summary of the history, any previous treatment. (?) patients should include with binocular vision anomalies.

Student Obligations and Conditions:
Regular attendance of exercises.
Regularity and execution of exercise tasks.

Student Assessment Methods:
Presence in exercises.
Activity in exercises.
Final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
Yes	Clinical Case		
Yes	Case Presentation		
Yes	Face to Face Exercises Presence		
No	Final Exam		
	TOTAL POINTS:		**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
Anterior segment pathology
Posterior segment pathology
Eye Related System Pathology

Student Workload Assessment:

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION

LECTURES			Online discussion with students, attendance record. Quiz
			Control of acquired knowledge in face to face exercises.
STUDENTS WORK			Research work, Quizzes
TOTAL		**ECTS**	

Compulsory Literature:

1. **Optometry: Science, Techniques and Clinical Management, by Mark Rosenfield MCOptom PhD FAAO, Nicola Logan MCOptom PhD:**
2. **Strategic Management of Health Care Organizations by Linda E. Swayne,W. Jack Duncan,Peter M. Ginter**

3. Clinical Procedures in Primary Eye Care (3rd ed.) David B. Elliott, ed., Philadelphia, Elsevier Butterworth-Heinemann; 2007

Recommended Literature:

Notices:

Update History:

Course Name: Sport Vision			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
3	3+3+0	90	5

Course Coordinator:

Course Teaching Staff:

Course Aims:
To be able to evaluate and analyse visual performance of an athlete. To be able to improve visual performance of athletes through various vision training programs and using visual aids. To understand which refractive error correction methods are appropriate for each type of sport (corrective glasses, contact lenses, refractive surgery). To understand the connection between our eyes and our body.

Course Content:
Introduction to Sport Vision:
- Vision Training for athletes in Optometric practice
- Equipment used in Vision Training
- Sport related eye injuries
- Correcting refractive errors in athletes (glasses, contact lenses, refractive surgery)
- Using filters to improve visual performance

Designing a Sport Vision evaluation:
- Case history
- Static and dynamic visual acuity / Refractive status
- Slit lamp examination
- Importance of Contrast sensitivity and Colour Vision
- Eye/hand/foot preference
- Ocular alignment / Depth perception / Eye motility
- Vergence and accommodative function
- Speed of recognition, motor response time and reaction time
- Eye-hand and eye-body coordination
- Vision and balance
- Peripheral awareness

Designing a Vision Training program:
- Accommodation / Vergence Facility training
- Dynamic Visual Acuity (saccades nad pursuits) training
- Eye-hand / eye-body / eye-foot coordination
- Central vision reaction time
- Peripheral awareness and reaction time
- Anticipation timing
- Speed of recognition
- Visual memory

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
- Understanding visual demands for professional athletes
- Understand types of refractive correction methods appropriate for athletes.
- Design a vision training program to improve performance of athletes.
- Understand how to use most common Sport Vision equipment in optometric practice.

Course Learning Outcomes:
After finishing this course student will know how to:
1. Understanding how to properly assess athletes vision functionality.
2. Understanding of eye-hand, eye-foot and eye-body communication.
3. Detailed knowledge about designing a vision training program.
4. Knowledge about using Sport Vision equipment in optometric practice.
5. Ability to recommend the best type of refraction error correction.

Teaching Strategies:
Online Lecture, Clinical Exercises

Exercises Type (Laboratory / Auditory / Clinical)
Clinical exercises

Exercises Content:
Evalution and analyzing visual performance of professional athletes: eye-hand coordination, dynamic visual acuity, peripheral awareness, anticipation timing, speed of recognition, visual memory

Practical Work:
-

Student Obligations and Conditions:
Regular attendance of online lectures and exercises.
Teaching activity by tracking lecture content, performing tasks, and participating in discussions on the results of the exercises.
Regularity and execution of exercise tasks.

Student Assessment Methods:

Presence in online lectures and exercises.
Activity in online lectures and exercises.
Final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
No	Online Lectures Presence and Activity	20	35
Yes	Face to Face Exercises Presence and Activity	20	40
No	Final Exam	12,5	25
	TOTAL POINTS:	60	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 150 hours (5 ECTS)

- Online Lectures – 30 hours (1.0 ECTS).
- Face to Face Exercises - 30 hours (1.0 ECTS)
- Individual student work: preparing for the quizzes and exercises, reading the literature – 90 hours (3.0 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1.0	1-5	Discussion with students, attendance record.
FACE TO FACE EXERCISES	1.5	1-5	Discussion with students, control of acquired knowledge in exercises.
STUDENTS WORK	3.0	1-5	Final exam
TOTAL	**5 ECTS**		

Compulsory Literature:
Graham B. Ericskon (2007), Sports Vision: Vision Care for the Enhancement of Sports Performance, Butterworth-Heinemann Publisher

Recommended Literature:

Notices:

Update History:

Course Name: Clinical Practice II.			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
4			

Course Coordinator:

Course Teaching Staff:

Course Aims:
The requirement of this module is that the student examine and presents detailed case records that demonstrate experience of the contact lenses fitting, low vision detailed case and skills in working with children, especially with pre-school children manage in optometric practice .

Course Content:
Protocol for demonstration of student's optometric knowledge and skills:
History and symptoms (anamnesis):
Childs age, gender and other pertinent information for differential diagnosis.
Chief complaint: Reason for parents request for child's eye examination.
Signs and symptoms as described by parent
Additional information about the child's complaints
Additional information for contact lens or spectacle follow-up
Refractive history: History of patient wearing glasses, contact lenses (solutions used), etc.
Ocular history: Patient's problems in the past, possible past or present medical or surgical treatments and additional information of the treatment if present
Systemic history: Pertinent information about possible systemic disease.
Medication use: Patient's usage of medication (possibility of side effects), type and frequency of usage, compliance of medication, including possible rewetting-drops for ocular problems.
Family history: Any similar problems in the family
Differential diagnosis:
Based on the obtained information provided by the patient during history taking, student should be able to provide diagnoses which could be the cause of the patient's complaints. Ruling in or out the conditions during examination, based on the differential diagnoses building of examination strategy.
Clinical information collection:
List the tests and the test results you performed to evaluate the patient. These should include examination of the anterior and posterior segments of the eye, cover test, ocular motility, objective and subjective refraction and any other tests as required, supporting photographs, printouts, visual fields, etc. Indicate whether test results are outside normal limits and whether findings are different from what you would expect considering age, gender, appearance etc.
Pictorial evidence: Including drawings, diagrams, visual field plots and photographs in the record is recommended. If a photo slit-lamp is not available, it is possible to take reasonable quality photographs of the external eye with a normal digital camera or a smartphone. Sometimes photographing through the slit lamp eye piece can give adequate results.
Tentative diagnoses:
The student should provide a list of possible diagnoses. Reflecting on refractive problems, ocular disease primary or secondary to systemic disease, systemic diseases that potentially could cause the current or future ocular problems.
Management plan:
Each diagnosis should go along with a plan that you make on how to approach or solve the patient's problems. The plan should contain pertinent information on

- Student clinical judgment (i.e. situation stable, better, worse)
- Possible other tests needed to be performed to determine definite diagnosis
- Student advice and explanation to the parents.
- Possible referral of the patient, to other specialists and for specific timeframe
- Possible referral of the patient for a follow-up with specification of the time
- Appropriate refractive correction must be determined
- Type of refractive correction dispensing (spectacles or contact lenses)
- Specification of spectacles lenses and frame or contact lenses.
- Instructions for wear.

Contact lens specific testing

- Refraction
- Cornea topographical data:
- Central and peripheral keratometry readings OR
- Corneal topography pictures with readable K-readings
- Data of the selected preliminary lens
- Evaluation of the preliminary lens including supporting evidence
- Drawings, photos (or movie on a CD) showing the movement and positioning of the lens
- Fluorescein evaluation (photo) for RGP lenses
- Refraction with preliminary lens

Tentative diagnoses:
Providing a list of possible diagnoses. Reflecting on refractive problems, ocular disease primary or secondary to systemic disease, systemic diseases that potentially could cause the current or future ocular problems.
Management plan:
Each diagnosis should go along with a plan that you make on how to approach or solve the patient's problems. The plan should contain pertinent information on

- Student clinical judgment (i.e. situation stable, better, worse)
- Possible other tests needed to be performed to determine definite diagnosis
- Student advice and explanation to the patient
- Possible referral of the patient, to other specialists and for specific timeframe

- Possible referral of the patient for a follow-up with specification of the time
- Appropriate refractive correction must be determined
- Type of refractive correction dispensing (spectacles or contact lenses)
- Specification of spectacles lenses and frame or contact lenses.
- Instructions for wear

Including changes needed to be made to improve the lens fitting
Providing an explanation for making the changes
Including a follow-up visit with the evaluation of the adjusted lens
Including the data of the lens prescribed

Discussion:
A brief discussion of each of student's cases should be provided with respect of the problems student encountered. Description of the thinking process of coming up with the differential diagnosis after history. Description of methods student used to come to the final diagnosis and reasons for further referral of the patient or absence of referral. Refractive correction should be justified by the student. Reason and timeframe of patient's follow-up referral.

The student requirement of this module is examination and presentation of detailed cases that demonstrate experience of the whole range of paediatric optometric practice.
Pediatric Care Eye Examination Records – All the records should cover a complete eye examination, starting with a summary of the history, any previous treatment..

Contact lens cases to show students skills.
2 cases Soft-toric contact lenses (astigmatism > 1,5 dioptres)
2 cases RGP-toric contact lenses (astigmatism > 2 dioptres)
3 case Special contact lenses (i.e. keratoconus, keratoplasty after refractive surgery, bifocal RGP lens, multifocal RGP or soft contact lens, scleral lens, etc.)
Low vision cases to show students skills in low vision patient management.

All the records should cover a complete eye examination, starting with a summary of the history, any previous treatment up to the time of the examination.
The contact lens fittings should be illustrated with appropriate diagrams and photographs.
Low vision cases should be documented with list of all applications used in process.

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
Ability to communicate with the patient (child and parent) to obtain the case history and family history.
Ability to make general observations of the underaged patient.
Ability to obtain and interpret patient information from other professionals.
Ability to formulate and implement an examination plan.
Ability to assess central and peripheral sensory visual function and the integrity of the visual pathways.
Ability to understand how to fit contact lenses especially special contact lenses.
Ability to assess the significance of signs and symptoms found incidental to the ocular examination in relation to the patient's eye and/or general health.
Ability to ensure that optometric knowledge, clinical expertise and equipment remain current.
Ability to provide advice and information to parents.
Ability to understand the principles of the planning, establishment, development and maintenance of an optometric practice.
Ability to understand the legal obligations involved in optometric practice.
Ability to provide for the care of patients with special needs.
Ability to design a management plan for each patient and implements the plan agreed to with the patient.
Ability to refer the patient with ocular injury and in disease suspect.
Ability to ensure that data is organized in a legible, secure, accessible, permanent and unambiguous manner.

Course Learning Outcomes:
After finishing this course student will know how to:

1. Obtain the case history and interpret patient information from other professionals.
2. Ability to recognise and manage all eye condition with diagnostic instument (slit lamp. OCT, etc..)
3. Communicate with the underaged patient and parents
4. Observe the child patient and obtain the case history from parents.
5. Provide for the care of child patients with special needs
6. Use a systematic understanding of the various techniques for investigating children's visual functions and ocular health
7. Prescribe and apply contact lenses to children
8. Ability to make all testing for contact lenses.
9. Manage child patients requiring vision therapy.
10. Ensure that optometric knowledge, clinical expertise and equipment remain current.
11. Understand the principles of the planning, establishment, development and maintenance of an optometric practice

Teaching Strategies:
Lab,Clinic, Self study

Exercises Type (Laboratory / Auditory / Clinical)
Clinical exercises.

Exercises Content:
Protocol for demonstration of student's optometric knowledge and skills:
History and Symptoms (Anamnesis); Chief complaint; Refractive history; Ocular history; Systemic history; Medication use; Family history; Differential diagnosis; Clinical information collection; Pictorial, photo or video evidence; Tentative Diagnoses; Management Plan; A brief discussion of each of student's cases should be provided;
Contact lens cases to show students skills.
2 cases Soft-toric contact lenses (astigmatism > 1,5 dioptres)

2 cases RGP-toric contact lenses (astigmatism > 2 dioptres)
3 case Specialty contact lens (i.e. keratoconus, keratoplasty after refractive surgery, bifocal RGP lens, multifocalt RGP or soft contact lens, scleral lens, etc.)
Low vision cases to show students skills in low vision patient management.
All the records should cover a complete eye examination, starting with a summary of the history, any previous treatment up to the time of the examination.
The contact lens fittings should be illustrated with appropriate diagrams and photographs.
Low vision cases should be documented with list of all applications used in process.

Student Obligations and Conditions:
Regular attendance of face to face exercises.
Regularity and execution of exercise tasks.

Student Assessment Methods:
Presence in face to face exercises.
Activity in exercises.
Final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
Yes	Contact lens Case (?)		
Yes	Low Vision Case (?)		
Yes	Paediatric Case (?)		
Yes	Face to Face Exercises Presence		
No	Final Exam		
	TOTAL POINTS:		**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
Paediatric Optometry and Strabismus
Vision Therapy
Special Contact Lenses
Low vision

Student Workload Assessment:

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
EXERCISES			
STUDENTS WORK			
FINAL EXAM			
TOTAL	**ECTS**		

Compulsory Literature:

Recommended Literature:
1. Contact Lens Practice, 3e 3rd Edition by Nathan Efron BScOptom PhD (Melbourne) DSc (Manchester) FAAO (Dip CCLRT) FIACLE FCCLSA FBCLA FACO (Author)
2. Low Vision Rehabilitation: A Practical Guide for Occupational Therapists 1st Edition by Mitchell Scheiman OD FCOVD FAAO (Author), Maxine Scheiman (Author), Stephen G. Whittaker PhD FAAO OTR/L CLVT (Author)

Notices:

Update History:

Course Name: Microbiology and Immunology			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
4	2+0+0	30	3

Course Coordinator:

Course Teaching Staff:

Course Aims:
Microbiology principles an aid to diagnosis, specimens required for diagnosis, characteristics of commonly found microorganisms; differences between bacteria, fungi and viruses.

Course Content:
General Microbiology

Virology
- Structure and morphology, Classification , Viral diseases, Immunity, Laboratory diagnosis

Bacteriology
- Structure and morphology, Gram staining, Anaerobic and aerobic bacteria, Physiological processes of bacterial growth, Bacterial diseases, Pathological mechanisms of bacterial infection, Immunity, Laboratory diagnosis

Mucology
- Biology of fungi , Mycotic diseases , Laboratory diagnosis

Parasitology
- Acanthamebia, Toxoplasma, Onchocercus, Toxicariasis, Phtiriasis

General Immunology
- **Antigens and antibodies**
- **Complement system**
- **Non-specific immunity**
- **Specific immunity**
- **Hypersensitivity responses**
- Anaphylactic hypersensitivity, Cytotoxic hypersensitivity, Complex-mediated hypersensitivity, Delayed hypersensitivity

General and Specific Competencies (knowledge, understanding, skills and abilities):
After finishing this course student will have:
Ability to illustrate general bacterial morphology, physiology and genetics.
Ability to understand the host parasite relationship and microbial pathogenesis.
Ability to explain the physiology of the immune system, its beneficial role, as well as its detrimental role in hypersensitivity, autoimmunity and transplant rejection.
Ability to describe the morphology, culture, antigenic structure and virulence factors of microorganisms of biology importance.
Ability to recognize the most important infectious clinical conditions and outline the diagnosis, treatment, prevention and control of the most likely organisms causing such diseases.
Ability to describe the most important methods of decontamination and principles of infection control.
Ability to describe the basics of antimicrobial uses and resistance.
Ability to understand the impact of molecular technology in microbiology and immunology
Ability to identify medically important bacteria based on microscopic examination of stained preparations.
Ability to perform a Gram stain and a Ziehl-Neelsen stain and identify, according to morphology and characteristics, stained preparations
Ability to identify culture media and biochemical tests commonly used for bacterial identification and distinguish positive and negative results.
Ability to interpret results of microbiological, serological and molecular tests.
Ability to formulate a systematic approach for laboratory diagnosis of common infectious clinical conditions and select the most appropriate and cost-effective tool leading to the identification of the causative organism.
Ability to evaluate according to evidence the causal relationship of microbes and diseases.
Ability to categorize a microorganism as a bacterium, virus or fungus according to standard taxonomy.

Course Learning Outcomes:
After finishing this course student will know how to:
1. Illustrate the nature of viruses, bacteria and fungi and basic criteria used in the classification.
2. Demonstrate modes of transmission and the mechanisms of microbial pathogenesis and the outcomes of infection, including chronic microbial infections.
3. Describe a range of advanced laboratory techniques, including the purification of isolated microbial pathogens, review of microbial growth cycles and analyses of their proteins and nucleic acids for downstream applications such as gene cloning and sequencing studies.
4. Clarify treatment of infection caused by the pathogen.
5. Describe infection control procedures, sterilization methods and issues of patient safety.
6. Analyze immunological etiology of diseases.
7. List types of immunity and it's beneficial or harmful

Teaching Strategies:
Online Lecture, Self study

Exercises Type (Laboratory / Auditory / Clinical)
-

Exercises Content:
-

Student Obligations and Conditions:
Attendance in online lectures with active participation
Preparing and submitting the seminar paper within a given time period.

Student Assessment Methods:
Seminar, Quiz and final exam.

Scoring Criteria:

Requirement for exam application	Crediting criteria	Minimal credits	Maximal credits
No	Online Lectures and Online Presence and Activity	0	15
No	Quiz 1	0	35
No	Seminar paper	0	25
No	Final exam	12.5	25
	TOTAL POINTS:	**12.5**	100

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total 90 hours (3 ECTS points):

- Online Lectures – 30 hours (1 ECTS)
- Seminar assessment - 8 hours (0.25 ECTS)
- Independent work of a student: study of literature, preparation for teaching, preparation for quiz, preparation for final exam – 52 hours (1.75 ECTS points)

Constructive alignment:

TEACHING ACTIVITIES	STUDENT WORKLOAD	OUTCOMES	MONITORING METHOD / TEST
ONLINE LECTURE	1.0	1-7	Online discussion with students, attendance record
SEMINAR	0.25	1-7	Reading the literature, submiting seminar paper, online discussion
STUDENT WORK	1.75	1-7	Quiz and final exam
TOTAL	**3 ECTS**		

Compulsory Literature:

1. **Review of Medical Microbiology and Immunology, Fifteenth Edition** 15th Edition,Kindle Edition by Warren E. Levinson (Author), Peter Chin-Hong (Author), Elizabeth Joyce (Author), Jesse Nussbaum (Author), Brian Schwartz (Author)2018

Recommended Literature:

Notices:

Update History:

Course Name: First Aid			Course Code:
Semester:	**Lecture + Exercises + Seminar:**	**Total:**	**ECTS points:**
4	2+1+0	45	4

Course Coordinator:

Course Teaching Staff:

Course Aims:
Basic knowledge of first aid in optometry practice.

Course Content:

Resuscitation I ;

- Cardiopulmonary resuscitation ;
- Examination of the casualty
- Basic vital functions.
- Breathing disorders,
- apnea
- airway obstruction.
- Airway management,
- artificial ventilation

Resuscitation II ;

- Cardiac arrest,
- circulation failure.
- Chest compressions,
- precordial thrust,
- cardiopulmonary resuscitation.CPR in children.

Bleeding :

- external,
- internal.
- Wounds
- bleeding management
- shock
- treatment

Emergency situations in ;

- Fainting, fatigue.Disorders of consciousness, coma. Seizures, cramps.
- Head injuries, face injuries, skull fractures, brain concussion, intracranial bleeding.
- Backbone injuries, contusions, fractures, spinal injuries. Treatment, fixation, transport.Chest injuries, rib fractures, pneumothorax.
- Abdominal injuries, injuries to the pelvis, lower extremities, polytrauma. Fixation, immobilisation skills, splints.
- Road accidents, multiple casualties situations. Survey, assesment, evaluation of the casualties, first aid organisation.
- Diabetic patients.
- Heat and cold injuries,
- Electrical injuries.
- Burns
- Scalds
- Heat stroke
- Heat exhaustion
- Hypotermia
- Frostbites
- Chemical burns
- Chest pain evaluation
- Infection, rabies, allergic reactions.
- Poisoning alcohol, drugs, CO, food.
- Injuries to the eye.

General and Specific Competencies (knowledge, understanding, skills and abilities):

After finishing this course student will have:
Perform ocular first aid in workplace environments.

Ability to give first aid as soon as possible to a person who is injured or who suddenly becomes ill.

Ability to organize and provide hygiene and infection control in optometry practice.

Course Learning Outcomes:
After finishing this course student will know how to:

1. Recognize and provide emergency treatment for injury or sudden illness, before regular medical care is available
2. Apply basic life support: rescue breathing, choking, CPR, AED.
3. Recognize and respond in case of allergic reaction or anaphylaxis.
4. Act appropriately in bleeding and wound care, shock, burns; head, spinal, chest, & abdominal injuries; bone, joint & muscle injuries.
5. Recognize and respond in case of sudden illness: cardiac, stroke, respiratory, seizures, diabetes and other life threats.
6. Apply first aid for eye emergencies.

Teaching Strategies:
Online lecture, Exercises, Self study

Exercises Type (Laboratory / Auditory / Clinical)
Auditory

Exercises Content:
First aid simulations.
Emergency treatment.

Student Obligations and Conditions:
Attendance in online lectures and online auditory exercises with active participation.
Regularity and execution of exercise tasks.

Student Assessment Methods:
Online Lectures and Online Exercises Presence and Activity.
Quiz and final exam.

Scoring Criteria:

Exam Requirements	Scoring Criterion	Minimum Points	Maximum Points
No	Online Lectures and Online Exercises Presence and Activity	12.5	25
No	Quiz 1	13	25
No	Quiz 2	13	25
No	Final Exam	13	25
	TOTAL POINTS:	**51.5**	**100**

The grade scale and right to attend the final exam are regulated with Grading Rulebook (Pravilnik o ocjenjivanju).

Pre-Conditions:
N/A

Student Workload Assessment:
Total of 120 hours (4 ECTS):

- Online Lectures – 45 hours (1.5 ECTS)
- Online Exercises – 30 hours (1.0 ECTS)
- Individual student work: reading the literature and preparing for the quizzes and final examination – 45 hours (1.5 ECTS)

Constructive alignment:

COURSE ACTIVITIES:	STUDENT WORKLOAD	OUTCOMES	MONITORING / EVALUATION
ONLINE LECTURES	1.5	1 - 6	Online discussion with students, attendance record.
ONLINE EXERCISES	1.0	1-6	Online discussion with students, attendance record.
STUDENTS WORK	1.5	1 - 6	Quizzes and final exam
TOTAL	**4 ECTS**		

Compulsory Literature:

1. Advanced First Aid, CPR, and AED (Orange Book) 7th Edition by American Academy of Orthopaedic Surgeons

(AAOS) (Author), American College of Emergency Physicians (ACEP) (Author), Alton L. Thygerson (Author),
Recommended Literature: 1. First Aid for the Emergency Medicine Boards 2/E (First Aid Series) 2nd Edition by Barbara K. Blok (Author), Dickson S. Cheung (Author), Timothy F. Platts-Mills (Author)
Notices:
Update History: