

**PROFESSIONAL HIGHER EDUCATION STUDY
PROGRAMME 1st CYCLE DEGREE**

ORTHOTICS AND PROSTHETICS

Course information and outline

General information about the study programme

The first-cycle degree Professional Higher Education Study Programme Orthotics and Prosthetics lasts 3 years (6 semesters), comprising 180 ECTS credits in total. The professional title awarded to the first-cycle degree graduate is *diplomiran ortotik in protetik* (VS), or *diplomirana ortotičarka in protetičarka* (VS), respectively; abbreviation *dipl.ort. in prot.* (VS).

Goals of the programme and general competences

The Professional Higher Education Study Programme Orthotics and Prosthetics graduate will possess a broad range of core skills encompassing profession-specific and generic enabling skills in the fields of prevention, rehabilitation, fabrication and application of technical devices, education, evaluation, research and discipline development. They will be able to act as an autonomous and equal member of a rehabilitation team in the complex system of health care and contribute towards a better quality of life of physically impaired individuals.

General competences

Upon successful completion of the programme the diploma holder will be capable of:

- adherence to ethical principles
- reporting on hygienic and technical conditions in internal and external environments exerting impact on health; to initiate and participate in health promotion
- oral and written communication
- appropriate communication with colleagues and other professionals
- cross-professional cooperation in problem solving
- active participation in education and training research work in the field of prosthetics and orthotics
- using professional terminology
- autonomous decision-making
- critical judgement
- professional reasoning
- data gathering, interpretation, and critical evaluation of information

- analysing, synthesizing, solving and anticipating professional problems and outcomes in rehabilitation, application, fabrication and other socio-medical activities
- professional integration of knowledge and reasoning
- solving problems in internal and external contexts (multidisciplinary team)
- conducting research in the field of prosthetics/orthotics
- applying theoretical knowledge in practice
- applying theoretical and scientific bases of the pertinent discipline
- independent learning
- adjusting to and using advanced IT in the field of prosthetics/orthotics
- taking responsibility for autonomous life-long learning
- applying the contents and methods of prosthetics/orthotics
- professional autonomy and accountability in the performance of professional duties
- acquiring knowledge to follow the advances in the professional discipline
- communication in a foreign language
- adapting to new, unanticipated situations

Subject-specific competences in accordance with The International Society for Prosthetics and Orthotics (ISPO):

Formulation of treatment

The diploma holder:

- Understands the anatomical, physiological and pathological conditions of the locomotor system.
- Participates as a full or equal member of the clinical team; takes active part in the examination and prescription; designs the prosthetic/orthotic device and advises on the fabrication of orthosis/prosthesis, application and rehabilitation.
- Assists, appraises and advises on relevant aspects of pre-surgical, post-surgical, medical and therapeutic management of individuals requiring prosthetic/orthotic devices.
- Records and reports on pertinent information regarding patients and patients' families, including the determination of expectations and needs.
- Communicates appropriate information to the patients and their families.

Fitting, fabrication and treatment

The diploma holder:

- Identifies physical and other relevant clinical characteristics that may affect the treatment of the patient.
- Formulates prosthetic or orthotic designs, including the selection of materials, components and technical devices.
- Takes all casts and measurements that are necessary for proper fabrication and fitting.
- Modifies positive and/or negative models and/or layout of design to obtain optimal fit and alignment of orthosis/prosthesis.
- Possesses the knowledge of biomechanics of the orthosis or prosthesis and its function.
- Carries out fitting, static and dynamic alignment and, where appropriate, preliminary training and initial check-out.

- Performs and/or supervises fabrication of the orthosis and prosthesis.

Evaluation and follow-up

The diploma holder:

- Advises the team and participates directly in the final check-up and evaluation of the fit, function and cosmetics of the device.
- Instructs the patient or family in the application, use and care of the device.
- Takes part in the follow-up procedures as well as the maintenance, repairs and replacement of the appliance.
- Recognises the need to repeat any of the identified steps in order to optimize fit and function.
- Collaborates and consults with others engaged in the management and rehabilitation of the patient.

Management and supervision

The diploma holder:

- Supervises the activity of support staff as appropriate.
- Manages clinical and laboratory activities assigned to them, including:
 - use and maintenance of tools and equipment
 - maintenance of a safe working environment and procedures
 - inventory and stock control
 - personnel matters
 - financial matters
 - appropriate record keeping
 - total quality management
- Identifies and introduces improved job methods for increased efficiency.
- Interacts with professional groups and, where appropriate, governmental and non-governmental agencies.
- Takes part in the planning, development and implementation of technical orthopedic care systems.

Training and education

The diploma holder:

- Supervises and conducts education and training
- Lectures and demonstrates to colleagues and other professionals concerned with prosthetics/orthotics and also to other interested groups.
- Is required to take part in and contribute to the process of continuing professional development.
- Critically evaluates new developments in prosthetics/orthotics.
- Makes a professional contribution to and takes part in community rehabilitation programmes related to prosthetics/orthotics.

Research and development

The diploma holder:

- Conducts continuing evaluation of their activities.

- Develops and actively participates in formal evaluation and research programmes.
- Participates in scientific/professional meetings and contributes papers to scientific/professional journals.

Admission requirements and selection criteria in case of limited enrolment

40 students may enroll in the programme per year.

The following persons may apply for the undergraduate programme of Orthotics and Prosthetics:

- a) those that have passed the upper secondary school leaving exam (matura)
- b) those that have passed vocational matura in any secondary school programme

In case of limited enrolment:

- Applicants under a) above will be selected according to:

- overall score in the matura exam	60%
- grade average in years 3 and 4	40%
- Applicants under b) above will be selected according to:

- overall score in the final exam	40%
- grade average in years 3 and 4	30%
- grade average in natural sciences (Mathematics, Physics or Chemistry) in years 3 and 4	30%

Prior to entering the clinical training and clinical practice the students must fulfill the special conditions as defined in the Call for enrolment for each individual year, namely, the obligatory vaccination in accordance with the Rules on vaccination, immunization and protection against spread of infectious diseases.

Vaccination is not a prerequisite for enrolment. It will be organized by the Faculty of Health Sciences. The schedule of vaccination will be provided upon enrolment.

Recognition of knowledge and skills acquired prior to admission

Recognition of the student's prior learning or current competencies (in ECTS) acquired through other study programmes may be granted if they match the contents and educational goals of the Orthotics and Prosthetics programme. In compliance with the criteria regarding prior learning recognition adopted by the University of Ljubljana, the Study Committee of the College of Health Studies shall make a decision on the recognition and crediting of the applicants' knowledge and skills on the basis of students' individual applications and the provision of certificates and other documents attesting to the acquired knowledge.

Recognition of prior knowledge will be based on the following criteria:

- prior education meeting the admission requirements,
- the comparability of the extent of education (the workload per subject),

- the comparability of content..

The knowledge acquired prior to admission will be recognised if:

- the admission requirements are equivalent;
- previous education covers at least 75% of the extent and match at least 75% of the content of the subject to be recognised.

The number of ECTS will be granted accordingly.

Promotion requirements

To advance to the subsequent year of the undergraduate programme, the student must fulfil all the obligations defined by the programme and syllabi - obligatory attendance of study activities - lectures, skills lab and clinical practice and the required number of ECTS credits.

The minimal number of credits:

- for enrolment into the second study year is 51 ECTS are mandatory from the first study year and the completion of Seminar practice and Laboratory practice. Mandatory ECTS are obtained from the subjects: Biophysics, Fundamentals of Biomedicine, Anatomy and Physiology with Pathology, Chemistry and Technology of Materials, Special Biomechanics and Clinical Placement 1.
- for enrolment into the third study year 60 ECTS are mandatory from the first study year and at least 45 ECTS from the second study year. Mandatory ECTS are obtained from the subjects: Assessment of Locomotor Function, Prosthetics, Control and Management of Movement, IT and Basics of CAD/CAM, Technical Appliances and Clinical placement 2.

In exceptional circumstances, as defined in the Statute of the University of Ljubljana (Art. 152 and 153), the Study Committee can approve of the enrolment into:

- the second study year if the student has achieved at least 40 ECTS from the first study year,
- the third study year if the student has achieved 60 ECTS from the first study year and at least 42 ECTS from the second study year.

Completion of the course

The undergraduate programme is completed after all of the obligations given for the respective subjects have been satisfied and 180 ECTS have been earned.

Transfer between programmes

Transferring from a short-cycle college programme (two-year higher school programme)

Transfer is not possible as there are currently no parallel accredited undergraduate programmes in Slovenia.

Transfer from one first - cycle degree programme or university degree programme to another

- Transfer is possible from the higher professional health education programmes and university health programmes accredited in Slovenia. In transferring, all the fulfilled and recognised requirements of the prior programme determine the academic year of further study.
- Transfer is also possible from all university or higher professional education programmes of orthotics, prosthetics run in the EU member states. In transferring, all the fulfilled and recognised requirements of the prior programme determine the academic year of further study.

Transferring between study programmes is at the discretion of the Study Commission of the College of Health Studies. All transfers are subject to individual review and follow the Regulations Statute of the College of Health Studies, Ljubljana.

Grading system

Assessment strategies and methods complement the learning outcomes. Students' theoretical knowledge and/or practical skills are assessed for each individual subject by the end of the course. The assessment modes (oral or written examination, tests, seminar papers, diaries, reports, projects, portfolios) are defined in the subjects' syllabi. The assessment regimes are defined in the Rules on Knowledge Assessment, adopted and approved by the Academic Senate of the College of Health Studies. The grading scale is in accordance with the Statute of the University of Ljubljana.

- 10 – excellent, extraordinary results with negligible mistakes
- 9 – very good, above average knowledge with some mistakes
- 8 – good, fairly good knowledge
- 7 – satisfactory, adequate knowledge with some major mistakes
- 6 – sufficient, knowledge meets minimum standards
- 5 to 1 – fail, knowledge does not meet minimum standards

Study programme syllabi

The first-cycle degree Professional Higher Education Study Programme Orthotics and Prosthetics lasts 6 semesters (3 years). A study unit is a subject. The programme is comprised of 22 compulsory and 14 elective subjects (a student can choose 6 subjects).

Presented in the Table 1 is a list of subjects and the anticipated head lecturers

Table 1: *A list of core subjects and the anticipated head lecturers*

No.	Subject	Head lecturer
1.	Biophysics	France Sevšek

2.	Introduction to Research Methodology	Majda Pahor
3.	Social Sciences in Health Care	Asja Nina Kovačev
4.	Fundamentals of Biomedicine	Martin Bauer
5.	Anatomy and Physiology with Pathology	Raja Gošnak Dahmane
6.	Fundamentals of Clinical Medicine and First Aid	Damjan Slabe
7.	Chemistry and Technology of Materials	Jožef Horvat
8.	Special Biomechanics	Klemen Bohinc
9.	Professional Ethics	Mojca Divjak
10.	Clinical Placement 1	Dominik Erzar
11.	Assessment of Locomotor Function	Sonja Hlebš
12.	Prosthetics	Dominik Erzar
13.	Health Education	Silva Hoyer
14.	Control and Management of Movement	Darja Rugelj
15.	IT and Basics of CAD/CAM	Jelena Ficzkó
16.	Research and Development in the Field of OP	Tomaž Maver
17.	Technical Appliances	Anton Zupan
18.	Clinical Placement 2	Dominik Erzar
19.	Orthotics	Anton Brezovar
20.	Spinal Orthotics	Anton Brezovar
21.	Professional Terminology in a Foreign Language	Tina Levec
22.	Work Organisation in Health Care	Mojca Divjak
23.	Rehabilitation for people with physical limitations	Urška Puh
24.	Rehabilitation Engineering	Anton Zupan
25.	Clinical Placement 3	Anton Brezovar
26.	Diploma Work	Tomaž Maver
	General elective subjects*	
27.1	Management in Health Care	Marija Bohinc
27.2	Health Care in Emergency Situations	Damjan Slabe
27.3	Health Care from Consumers' Perspective	Majda Pahor
27.4	English Language	Tina Levec
27.5	German Language	Irena Kuštrin
	Professional elective subjects	
27.6	Team Management of Wounds	Bernarda Djekič
27.7	Fundamentals of Electrotechnics	Klemen Bohinc
27.8	Paediatrics	Anton Kunstlj
27.9	Fundamentals of Physiotherapy	Urška Puh

27.10	Seniors and Assistive Devices	Marija Tomšič
27.11	Health Legislation	Blaž Ivanc
27.12	Radiologic Imaging Methods	Veronika Lipovec
27.13	Social Medicine	Andrej Plesničar
27.14	Geriatrics	Miroljub Jakovljević

Subjects are common to all programmes run at the College of Health Studies.

Table 2: A sequence of subjects per each study year, the number of contact hours, the proportion of different study modes, the total student workload and the number of credits assigned to each subject.

1st YEAR	SB *	Contact hours										Σ TSW	ECTS
		L	S	SP	LP	CP	CPI	CH					
1st semester													
1	OGS	70			20						90	180	6
2	OGS	30		15							45	90	3
3	OGS	60	30								90	180	6
4	OGS	40		20							60	120	4
5	OGS	70		15	10						95	180	6
6	OGS	60			15						75	150	5
1st semester – total number of hours		330	30	50	45	0	0	0	0	0	455	900	30
2nd semester													
7	OPS	65		20	20						105	210	7
8	OPS	90			45						135	270	9
9	OPS	25	20								45	90	3
10	OPS	45									45	90	3
11	OPS								200 (8 weeks)		120	240	8
2nd semester – total number of hours		225	20	20	65	0	0	0	200	0	450	900	30
1st YEAR - total number of hours		555	50	70	110	0	0	0	200	0	905	1800	60

* In the first year students choose 1 of 3 general elective subjects.

2ne YEAR		SB *	Contact hours										Σ TSW	ECTS
3rd semester			L	S	SP	LP	CP	CPI	CH					
12	Assessment of Locomotor Function	OGS	75			20	40					135	270	9
13	Prosthetics	OGS	100	25		40	60					225	450	15
14	Health Education	OGS	35	10								45	90	3
15	Control and Management of Movement	OGS	45									45	90	3
3rd semester – total number of hours			255	35	0	60	100	0	0	0	0	450	900	30
4th semester														
16	IT and Basics of CAD/CAM	OGS	25			20						45	90	3
17	Research and Development in the Field of OP	OGS	15		30							45	90	3
18	Technical Appliances	OGS	30				15					45	90	3
19	Elective subjects*		135									135	270	9
20	Clinical Placement 2	OGS									300 (12 weeks)	180	360	12
4th semester – total number of hours			205	0	30	20	15	300	300	15	300	450	900	30
2nd YEAR - total number of hours			460	35	30	80	115	300	300	115	300	900	1800	60

* In the second year students choose 1 general elective subject and 2 professional elective subjects.

3rd YEAR		SB **	Contact hours										ECTS
5th semester			L	S	SP	LP	CP	CPI	CH	∑ TSW			
21	Orthotics	OG S	90		40		95		225	450		15	
22	Spinal Orthotics	OG S	40		25		25		90	180		6	
23	Elective subject*		90						90	180		6	
24	Professional Terminology in a Foreign Language	OG S	20	25					45	90		3	
5th semester - total number of hours			240	25	65	0	120	0	450	900		30	
6th semester													
25	Work Organisation in Health Care	OG S	30		15				45	90		3	
26	Rehabilitation for people with phphysical limitations	OG S	40			10	10		60	120		4	
27	Rehabilitation Engineering	OG S	30				15		45	90		3	
28	Clinical Placement 3	OG S						250 (10 weeks)	150	300		10	
29	Diploma Work	OG S	10		40				50	300		10	
6th semester - total number of hours			110	0	55	10	25	250	350	900		30	
3rd YEAR - total number of hours			350	25	120	10	145	250	800	1800		60	
TOTAL NUMBER OF HOURS										5400		180	

* In the third year students choose 1 general elective subject and 1 professional elective subject.

** OGS Obligatory general subject, OPS Obligatory professional subject, SB Subject block.

Elective subjects**		Year	Contact hours							Σ TSW	ECTS
SB			L	S	SP	LP	CPI	CH			
	General elective subjects										
1	Health Care in Emergency Situations	1	30	15				45	90	3	
2	English Language	1	20		25	15		45	90	3	
3	German Language	1		30		15		45	90	3	
4	Health Care from Consumers' Perspective	2	10	35				45	90	3	
5	Management in Health Care	3	30		15			45	90	3	
	Professional elective subjects										
6	Team Management of Wounds	2	15			15	15	45	90	3	
7	Fundamentals of Electrotechnics	2	45					45	90	3	
8	Seniors and Assistive Devices	2	10			35		45	90	3	
9	Radiologic Imaging Methods	2	30			15		45	90	3	
10	Social Medicine	2	30	10	5			45	90	3	
11	Health Legislation	3	30	15				45	90	3	
12	Fundamentals of Physiotherapy	3	45					45	90	3	
13	Paediatrics	3	25		20			45	90	3	
14	Geriatrics	3	45					45	90	3	

** Elective subjects are divided per study years.

Legend:

- L Lectures
- S Seminars
- SP Seminar practice
- LP Laboratory practice
- CP Clinical practice

CPI Clinical placement
 TSW Total student workload
 ECTS European Credit Transfer System credits
 CH Contact hours

Table 3: Total number of contact hours of the programme and students' obligations

Total number of contact hours of the programme ***	Contact hours							
	L	S	SP	LP	CP	CPI	ECTS	
1st year	555	50	70	110	0	200	60	
2nd year	460	35	30	80	115	300	60	
3rd year	350	25	120	10	145	250	60	
Total number	1365	110	220	200	260	750	180	

Information on the possibility of elective programme subjects and mobility

The programme offers 14 elective subjects (27.1 % ECTS), divided into two study blocks with 9 professional and 5 general elective subjects

Conditions for the implementation of elective subjects

The professional elective subjects will be offered if at least 10 students apply and the general elective subjects will be offered if at least 30 students apply.

External election

A student can earn at least 9 ECTS by taking subjects from any other undergraduate study programme at the College of Health Studies or other member faculties in Slovenia and abroad. The student has a free choice of subjects for the two elective study blocks.

Mobility

a student can transfer 60 credits earned from either obligatory or elective units from any orthotics and prosthetics programme of higher or university education in the European Union member states.

Course description

1. **Biophysics (6 ECTS):** mechanics, heat, waves, sound, electricity, mathematical analysis, vectors and basic vector and matrix operations.
2. **Introduction to Research Methodology (3 ECTS):** definition of basic terms – science, profession, research, scientific and professional literature; methods of statistical analysis.
3. **Social Sciences in Health Care (6 ECTS):** psychological, sociological and legal aspects of health care.
4. **Fundamentals of Biomedicine (4 ECTS):** selected topics from biochemistry, pharmacology, hygiene and epidemiology.
5. **Anatomy and Physiology with Pathology (6 ECTS):** structure and function of the human body, environmental risk factors and the basics of pathological changes.
6. **Fundamentals of Clinical Medicine and First Aid (5 ECTS):** basic features of internal diseases, surgical pathologies and injuries and first aid in sudden ailments and traumas.
7. **Chemistry and Technology of Materials (7 ECTS):** basic characteristics of various prosthetic and orthotic materials in view of their moulding and use.
8. **Special Biomechanics (9 ECTS):** laws of biomechanics of the locomotor system, force analysis and impact of mechanical forces on the body.

9. **Professional Ethics (3 ECTS):** code of professional ethics with deontology, responsibilities of prostheticians and orthoticians.
10. **Clinical Placement I (8 ECTS):** inter-professional collaboration, holistic and patient-oriented approach, communication skills, compliance.
11. **Assessment of Locomotor Function (9 ECTS):** tissues and organs of locomotor system, planes and axes of individual joint movements and their interaction.
12. **Prosthetics (15 ECTS):** patient examinations, amputation level, holistic treatment, selection, fabrication and application of prosthetic devices with static and dynamic alignment.
13. **Health Education (3 ECTS):** communication; health and health education in the primary, secondary, and tertiary levels, approaches, methods, pedagogies and the role of a health professional, health and work safety.
14. **Control and Management of Movement (3 ECTS):** control and management of gait and balance, voluntary movement, ability of skilful movement, mechanisms underlying the control of walking.
15. **Information Technology and CAD/CAM (3 ECTS):** information technology in positive orthotic/prosthetic cast modifications; computer-aided moulding of a model.
16. **Research and Development of OP (3 ECTS):** definition of basic terms – science, profession, research, review of scientific and professional literature; analysis and presentation of a professional issue.
17. **Technical Appliances (3 ECTS):** modern technical and technological solutions for substitution of specific physical impairment.
18. **Clinical Practice II (12 ECTS):** client examinations, measurement, positive moulding, material selection for moulding a prosthetic device, fabrication of a device, application and evaluation.
19. **Orthotics (15 ECTS):** application of devices along with the measurement, moulding, alignment and delivery.
20. **Spinal Orthotics (6 ECTS):** selection, fabrication and application of a spinal device according to the location of spine injury.
21. **Foreign Language in Orthotics and Prosthetics (3 ECTS):** active and passive language skills as used in orthotics and prosthetics.
22. **Organisation of Work in Health Care (3 ECTS):** the role and significance of proper organisation of work in health care; fundamentals of management (leadership, monitoring, staff recruiting and training).

23. **Rehabilitation for people with physical limitations (4 ECTS):** basic rehabilitation branches (medical, psychosocial and occupational), international classification of impairment, disability and handicap.
24. **Rehabilitation Engineering (3 ECTS):** modern technical and technological solutions for individuals with physical impairment; prevention, reduction and elimination of architectonic barriers.
25. **Clinical Practice (10 ECTS):** examination of a client, measurement, positive orthotic/prosthetic cast modifications, orthotic material selection, fabrication, application and evaluation.
26. **Diploma Work (10 ECTS):** consolidation and application of knowledge and skills demonstrating the holistic approach to prescription, application and evaluation of orthopedic devices.
27. **Management in Health Care (3 ECTS):** selected theories, concepts, approaches and principles of management in health care (strategic management, monitoring, staff recruiting and training).
28. **Health Care in Emergency Situations (3 ECTS):** the impact of natural and other disasters on man and environment.
29. **Health Care from Consumer Perspective (3 ECTS):** awareness of mandatory life-long learning, empathy and partnership with health care consumers.
30. **English Language (3 ECTS):** upgrade of professional terminology in the English language as used in health care.
31. **German Language (3 ECTS):** upgrade of professional terminology in the German language as used in health care.
32. **Team Treatment of Wounds (3 ECTS):** the importance of cross-professional approach to treatment of patients with chronic wounds, humane and holistic approach.
33. **Fundamentals of Electronics (3 ECTS):** fundamentals of electronics (electric current, electrical resistance, circuits, capacitors, conductors, semiconductors, transistors) in orthotics and prosthetics.
34. **Paediatrics (3 ECTS):** diagnosing the common children's diseases of locomotor system; the use orthotic and prosthetic devices.
35. **Fundamentals of Physiotherapy (3 ECTS):** modern concepts and methods of physical exercise in the prevention of various diseases/conditions and the decrease or recover from developmental irregularities, diseases and traumas.

36. **Seniors and Assistive Devices (3 ECTS):** outline of conditions hindering independent performance of living activities in elders; problem-based learning and case studies.
37. **Health Care Legislation (3 ECTS):** legal regulation of orthotics and prosthetics within a health care system, legal status of patients (their rights and duties); fundamentals of law: the concept of law, legal norms and legal order (hierarchy of legal norms).
38. **Radiological Imaging Methods (3 ECTS):** basic radiological imaging; CT, MR, US.
39. **Social Medicine (3 ECTS):** significance of critical approach to social medicine and public health issues; positive concepts of health; primary, secondary, and tertiary levels of prevention.
40. **Geriatrics (3ECTS):** definition of aging, population aging in Slovenia, theories of aging, basics of aging; active aging – physical activity, nutrition, intellectual activity, social care and safety.