EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN

Module Handbook

Population-Based Medicine

Master of Science

Current as of 30.08.2022

FACULTY OF MEDICINE
Department of Population-Based Medicine
Institute for Health Sciences

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1. General Information about the Program

Name of the program:	Population-Based Medicine
Degree:	Master of Science (M.Sc.)
Credits:	120 CP (30 hours workload per 1 CP)
Regular duration of study:	4 semesters
Type of study:	Full-time study
Start date:	Summer semester in 2023 and 2024, Winter semester each study year from 2025 on
Number of study places:	20 per study year
Admissions requirements:	• Bachelor's degree' with 2.5 or better • English language skills at the B2 level CEFR
Language of instruction:	English

2. Objectives of the Program

2.1. Introduction: Population-Based Medicine

What is population health?

Population health is a relatively new term. It is increasingly used by researchers, practitioners, policymakers, professional organizations, funding agencies, and the media. Several definitions have been provided. Those definitions focus on population dimensions, in distinction from the health of an individual (the focus of clinical medicine), and on a broad range of medical and non-medical factors that influence health. Keyes and Galea[1] define population health sciences as the study of the conditions that shape distributions of health within and across populations and of the mechanisms through which these conditions manifest in the health of individuals. Population health is a broad, interdisciplinary approach and includes health outcomes as well as patterns of health determinants (factors that influence health).

The goal of population health science is to better understand causes of health states in a population or group of individuals (for example, those with a chronic condition) and to improve health and prevent injury, illness, and premature death by informing policies, programs and interventions. The causes of population health are multidimensional and include behavioral, environmental, biological, social, economic, cultural, and psychological factors. Those determinants or risk factors accumulate throughout the life course, and they are embedded in dynamic interpersonal interactions.

What is the difference between population health and public health?

The terms population health and public health are often used interchangeably, although there is a debate in the scientific community whether population health and public health are identical or to what extent population health is different from public health. Galea and Vaughan[2] recently proposed a simple approach to bridging population health and public health: population health science is the basic science of public health, much as biomedical research is the basic science of clinical medicine. They pointed out that population health science provides the basic understanding of how health is produced, while public health aims to apply that understanding toward building and promoting health in populations.

What is population-based medicine?

The role of medicine and healthcare in population health science is known as population-based medicine or population medicine. The term population-based medicine refers to all aspects of community medical care, from primary prevention to tertiary care. Population-based medicine can be defined as population health science with a focus on medical conditions and patient populations. Population-based medicine often works with big datasets and epidemiological and statistical methods to identify patterns in the diseases and health of large populations. The identification of determinants for diseases, diagnoses and treatment at the population level supports the development of more specific health guidance and individualized conclusion.

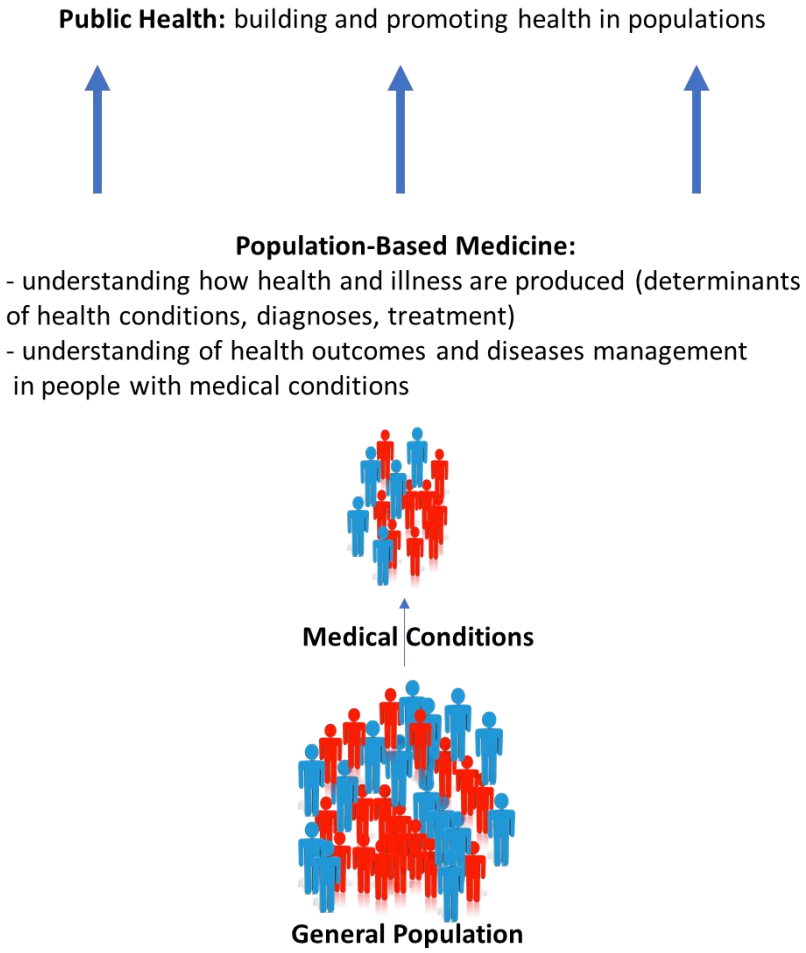

Figure 1: Interplay between Population-Based Medicine and Public Health

The critical need for a population-based medicine/health approach

Precision medicine is an emerging concept that focuses on the individual patient rather than a general approach when treating a medical condition. So far, the current focus of precision medicine is on the development of new drugs and interventions for the personalized treatment of chronic conditions. A major challenge for the future of personalized treatment is how to combine information from multiple dimensions, e.g., from micro-level factors (molecular markers) to macro-level factors (behavior, environment, social), to develop a better understanding of determinants of health and to improve treatment and health outcomes. As pointed out by

Khoury and Galea[3], "Even with millions of points of biological data collected from individuals, it may well be that population-level interventions affecting housing, nutrition, poverty, access to resources, and education may have more benefit on health than individualized interventions." It is likely that a combination of interdisciplinary and interprofessional approaches - ranging from population-wide interventions to specific interventions tailored to higher-risk groups - will improve the health of individuals and populations and decrease health disparities.

The recent COVID-19 pandemic has highlighted the importance of responsive public health systems and the importance of core population health competencies for prevention, detection, monitoring, and response to disease outbreaks. Those core competencies include knowledge, skills, abilities, and attitudes to effectively deliver essential public health functions like epidemiological surveillance, situation assessments, health promotion, and health intervention. They draw on multiple disciplines and professions and require strong leadership skills. The COVID-19 pandemic has exposed the urgent need for population health professionals. Beyond moments of crisis, population health experts also need to advise the public and policymakers on important health questions, including the development of resources and networks. A strong collaboration between public health practice and academia is needed to train population health professionals.

What is the focus of the MSc Population-Based Medicine program in Tübingen?

The MSc Population-Based Medicine program in Tübingen is integrated into the Faculty of Medicine and is a four-semester program that focuses on medical conditions, health behavior, psychosocial factors, and management. The overarching goal of this program is to bring together expertise from the health, behavioral, and social sciences, to provide interprofessional and interdisciplinary perspectives, particularly at the intersections of the fields, and to gain international experience on population health-related topics. Interprofessional education, collaborative learning and problem-oriented learning are important components of the program. An (international) practicum during the third term is a key component of the program. The purpose of the practicum is to obtain experience and apply professional competencies in population-based medicine. The practicum gives students the opportunity to apply theories from the classroom to real-world settings.

2.2. Aims

The aim of the program is to train researchers and develop leaders in the emerging field of population-based medicine to address today's health-related problems. Its mission is to provide the necessary skills to create, synthesize, integrate, disseminate, and apply knowledge to maintain and improve the health and wellbeing of patients and populations. The program is designed to train students as problem-solving professionals through rigorous, interdisciplinary education, research, and practice. Students will receive training in the core research methods used in population health science to examine the associations between health determinants and health outcomes. The program will teach students how to critique, design and analyze population health studies and will give them the opportunity to carry out focused research under close supervision. Students will also gain valuable experience through a minimum 14-week practicum in a research or practice setting where they will address a population health problem.

Methodological and analytical training is grounded in biostatistics, epidemiology, and health services research but also emphasizes methods employed in the behavioral and psychosocial research that contribute to the study of health in populations.

The Master's program in Population-Based Medicine is a consecutive, research-oriented program, which leads to a Master of Science (M. Sc.) degree. The program is offered by the Faculty of Medicine and Institute of Health Sciences.

The program lasts four semesters and includes a total of 120 ECTS. The curriculum is divided into four parts: the first part focuses on methodological and analytical training including statistics, epidemiology, behavioral medicine, and research methods in population medicine, but also emphasizes methods employed in the social sciences (30 ETCS). The second part focuses on advanced research methods, behavioral factors, leadership skills, and public health related topics (30 ETCS). The mandatory 14 weeks practicum in the third semester will allow students to apply what they have learned in the classroom. They will develop skills as a population health practitioner or researcher. Practicums can be completed nationally or internationally; an international practicum is strongly encouraged. The program will culminate in a Master's thesis (30 ECTS) in the fourth semester, demonstrating evidence of original investigation and mastery of competencies of the program.

The number of students is limited to 20; therefore, seminars and small group work are possible in all modules. A unique component of the program is mentorship. Members of the Population-Based Medicine Department and other instructors will be available for mentoring. All students are paired with a faculty mentor at the start of the program to help guide personal and professional development. The mentor will collaborate with the student throughout the program and help to implement a population-based research project for the Master's thesis, which will allow for a substantive project of publishable quality.

2.3. Learning Outcomes

Upon completion of this degree, graduates should possess the knowledge and skills to:

- Critically appraise and evaluate the designs, tools, measurements, and results of experimental and observational studies relevant to the health status of populations;
- Appropriately plan, undertake and synthesize research in population health and disseminate findings to benefit high-risk patient groups and populations;
- Utilize appropriate analytical and research methods to design, deliver, monitor and evaluate health interventions in people with medical conditions;
- Appraise behavior and psychosocial factors as major components of health promotion, disease prevention and population health;
- Explain the epidemiology of common diseases in the local, national, and global context and apply the knowledge in controlling and preventing those diseases by addressing modifiable risk factors;
- Promote the health of individuals, families and communities by focusing on health needs and health-related problems considering the given social, cultural, economic and demographic context;

- Communicate population health principles effectively and coherently to specialist and non-specialist audiences;
- Apply leadership, teamwork, and management skills to work effectively in interdisciplinary and interprofessional teams.
- Display interdisciplinary health communication skills

2.4. Future Career

A Master's degree in Population-Based Medicine opens a variety of paths to pursue, including careers in academia, national and international health organizations, government agencies or in industry. Our graduates will have acquired skills and techniques in a wide range of health-related areas, as well as collaborative team working, communication and research abilities. They will be empowered with the knowledge and skills to anticipate and address the healthcare needs of the future.

Career options include working at

- Local planning and government offices (e.g., Public Health Officer in Municipal or Provincial Health Departments)
- Hospitals (Health Administrator, Communication Officer, Health Promotion Specialist, or Healthcare Worker with a focus on community/public health)
- Consulting companies (Health Care Consultant, Health Policy Analysts, or Health Data Scientists)
- Health insurance companies (Healthcare Administrators, Analyst, Health Data Scientists)
- National and international (health) organizations (e.g., Program Manager, Program Administrator, or Health Data Scientists)
- Pharmaceutical companies (Researcher, Population Health Scientists with a focus on regulations in international health systems)
- Universities and research institutes (Researcher, or Research Coordinator)
- Non-governmental organizations (Health Policy Analyst, Project Management Specialist, or Strategic Partnerships Analyst)
- Various companies (Occupational Health Manager)

Our program also provides a solid foundation for PhD studies upon the completion of the Master's degree program.

2.5. Application requirements and target group

In order to apply for the Master's Program Population-Based Medicine, applicants need to fulfill the following prerequisites.

- Completed Bachelor's degree (6 semesters) in Health Sciences or an equivalent degree in a related field of study with a
- Final grade of 2.5 (German grading system) or better
- English language proficiency at the level of B2 CEFR (Common European Framework of Reference for Languages)

The following subjects/first degrees *could* be considered as comparable to Health Sciences:

• Public Health	• Health Economics
• Epidemiology	• Health Policy
• Medicine	• Biostatistics
• Dentistry	• Psychology
• Nursing	• Sports
• Midwifery	• Sociology
• Nutrition	• Cognitive Sciences
• Pharmacy	• …….

Applicants should make sure to include a Transcript of Records or similar documents which describe the contents of their Bachelor's Degree in order to allow for assessment of the comparability of the field. A final decision can only be made based on the complete application.

2.6. Selection process

The available 20 study places per year will be awarded according to the applicant's qualifications and experiences. The selection process consists of two stages, a pre-selection and a selection interview.

1. Pre-selection

A ranking list will be created based on the final or provisional grades of the applicant's first degree. Workplace or internship experience, scientific achievements, as well as acquired credit points in statistics and methods can earn the applicant bonus points in the selection process. A first ranking list is created based on the grade and the bonus points and the top applicants will be invited to an online selection interview.

2. Selection interview

The selection interview will focus on professional knowledge, aptitude, and motivation, as well as communication and analytical skills. English language skills and competencies in the areas of methods and statistics will also be part of the interview. The combined points from the

grade/bonus points and selection interview will determine which applicants are admitted to the program.

A more detailed description of the application requirements and the selection process can be found in the “Auswahlsatzung” and the “Studien- und Prüfungsordnung – Besonderer Teil” which can be downloaded from the website of the PBM program in both German and English. However, note that only the German version is legally binding.

References

1. Keyes MK, Galea S (2016) Setting the Agenda for a New Discipline: Population Health Science. American Journal of Public Health 106(4): 633–634.
2. Galea S, Vaughan R (2018) Population Health Science as the Basic Science of Public Health: A Public Health of Consequence. American Journal of Public Health 108(10): 1288-1289.
3. Khoury MJ, Galea S (2016) Will Precision Medicine Improve Population Health? Journal of the American Medical Association 316(13): 1357-1358.

3. Curriculum

3.1. Overview by Modules

(according to the module overview in the authoritative *Studien- und Prüfungsordnung*)

Module Code	Obligatory / Elective	Module Component Title	Recommended Semester	CP
PBM-1	**o**	**Population-Based Medicine I**	**1**	**12**
PBM-2	**o**	**Statistics I**	**1**	**6**
PBM-3	**o**	**Project in Health System**	**1**	**6**
PBM-4	**o**	**Biopsychosocial Medicine**	**1**	**6**
PBM-5	**o**	**Practice of Population-Based Medicine**	**2**	**9**
PBM-6	**o**	**Population-Based Medicine II**	**2**	**6**
PBM-7	**o**	**Statistics II**	**2**	**6**
PBM-8	**o**	**Public Health**	**2**	**9**
PBM-9	**o**	**Practicum**	**3**	**30**
PBM-10	**o**	**Master's Thesis**	**4**	**30**

3.2. Specifics on modules and coursework

Credit Points

Credit points (CP) are assigned to the individual modules. Credit points are a quantitative measure of the time spent by students on a module or a module component. One credit point

represents 30 hours of study. As a rule, 60 credit points are awarded per academic year, i.e., 30 per semester. According to national and international standards, a workload of 30 hours is assumed for one credit point for students in class and self-study. The total workload may not exceed 900 hours in a semester, including the lecture-free period of 1,800 hours in an academic year. It corresponds to an annual time commitment of 45 weeks of 40 hours each. Credit points cover both the actual teaching time in the courses (contact hours) as well as the time spent preparing and reviewing the course material (self-study) and the time spent on individual performances (examination preparation and writing the Master's Thesis). Credit points are awarded for attendance and participation in the courses assigned to the modules and are often linked to the completion of course-related individual work. The credit point system of the Master's program in Population-Based Medicine is compatible with the ECTS (European Credit Transfer System), i.e., a transfer of the credit points to other foreign courses of study is possible.

Module coursework

Coursework students need to fulfill during a single course for successful completion of a module. For a more detailed description see §§ 8 and 9 of the General provisions of the University of Tübingen exam regulations for Master's degree programs ("Masterrahmenprüfungsordnung").

Module assessment

Module assessment may consist of a pass-fail graded examination or an examination graded on a numerical scale. For a more detailed description see §§ 8 and 9 of the General provisions of the University of Tübingen exam regulations for Master's degree programs ("Masterrahmenprüfungsordnung").

Practicum

The practicum can be completed nationally or internationally; an international practicum is strongly encouraged.

3.3. Overview by Study Progress

Module Code	Module	Module Component Code	Module Component	Recommended semester	CP	∑ CP
PBM-1	Population-Based Medicine I	PBM-1.1	Introduction to Population Health	1	3	12
		PBM-1.2	Epidemiology I	1	3	
		PBM-1.3	Research Methods	1	3	
		PBM-1.4	Chronic and Infectious Diseases over the Life course	1	3	
PBM-2	Statistics I	PBM-2.1	Statistical Methods in Health Research I	1	4	6
		PBM-2.2	Statistical Software	1	2	
PBM-3	Project in Health Systems	PBM-3	International Health Systems	1	6	6
PBM-4	Biopsychosocial Medicine	PBM-4.1	Social and Behavioral Medicine	1	3	6
		PBM-4.2	Health Psychology	1	3	
PBM-5	Practice of Population-Based Medicine	PBM-5.1	Health Communication, Knowledge Translation and Public Health Leadership	2	3	9
		PBM-5.2	Health Policy and Health Economics	2	3	
		PBM-5.3	Design of Population-Based Intervention	2	3	
PBM-6	Population-Based Medicine II	PBM-6.1	Epidemiology II	2	2	6
		PBM-6.2	Evidence-Based Medicine	2	4	
PBM-7	Statistics II	PBM-7.1	Statistical Methods in Health Research II	2	3	6
		PBM-7.2	Population Genetics and Bioinformatics	2	3	
PBM-8	Public Health	PBM-8.1	Public Mental Health	2	3	9
		PBM-8.2	Lifestyle Behaviours, Health Promotion and Disease Prevention	2	3	
		PBM-8.3	Occupational and Environmental Health	2	3	
PBM-9	Practicum	PBM-9.1	Practicum	3	20	30
		PBM-9.2	Practicum Project	3	9	
		PBM-9.3	Meetings and seminar	3	1	
PBM-10	Master's Thesis and Colloquium	PMB-10.1	Master’s Thesis	4	24	30
		PMB-10.2	Colloquium	4	6	
					∑	**120**

Key	
Grading:	g = graded; ug = ungraded (pass/fail) ne = no module examination
Type of Exam:	W = written exam; O = oral exam; T = term paper; P = classroom presentation; MT= Master's Thesis, Pj = project
Duration:	duration of the examination in minutes
Weight:	courses: weighting of the examination grade towards the module grade modules: weighting of the module grade towards the final grade
Contact Hours:	CH; hours spent in the classroom per week during the semester
Status:	o = obligatory; e = elective
Type of Course	L = lecture; S = seminar; E = exercise; T = tutorial; P = Practicum; MT= Master's Thesis, Co = Colloquium, Pj = project
CP:	Credit Points (ECTS Credits)

4. Module Descriptions

4.1. Module Population-Based Medicine I

<table>
<tr><td>Module Code:
PBM-1</td><td colspan="5">Module Title:
Population-Based Medicine I</td><td colspan="4">Type of Module:
Obligatory</td></tr>
<tr><td>CP
(ECTS Credits)</td><td colspan="9">12 ECTS</td></tr>
<tr><td>Workload
- Time in Class
- Self-Study</td><td colspan="3">Total Workload:
360 h</td><td colspan="3">Time in Class:
180 h / 12 CH</td><td colspan="3">Self-Study:
180 h</td></tr>
<tr><td>Duration</td><td colspan="9">1 semester</td></tr>
<tr><td>Frequency</td><td colspan="9">Annually</td></tr>
<tr><td>Language of Instruction</td><td colspan="9">English</td></tr>
<tr><td>Forms of Teaching and Learning</td><td colspan="9">Lectures, small groups work, exercises, presentations</td></tr>
<tr><td>Content</td><td colspan="9">• An introduction to the main concepts of population health and epidemiology
• Qualitative and quantitative research methods and sampling
• Chronicity, infectivity, diagnosis and classification of diseases
• Epidemiology of chronic and infectious diseases</td></tr>
<tr><td>Objectives</td><td colspan="9">At the end of the module, participants will be able to:
• Explain the concepts of protection, disease prevention, and health promotion
• Demonstrate knowledge of the fundamental concepts and theories of population health and epidemiology
• Describe the psychosocial, behavioral, biological, and cultural determinants of population health across the life course
• Interpret measures of disease occurrence and measures of association
• Identify and distinguish basic epidemiological study designs
• Scientifically appraise the burden of chronic and infectious diseases in and across populations</td></tr>
<tr><td rowspan="5">Assessment: Requirements for Obtaining Credit, Grading, Weight if appl.</td><td></td><td>Type of Course</td><td>Status</td><td>CH</td><td>CP</td><td>Type of Exam</td><td>Length of Exam</td><td>Type of Evaluation</td><td>Calculation of Module Grade</td></tr>
<tr><td>Introduction to Population Health</td><td>L,E,S</td><td>O</td><td>3</td><td>3</td><td rowspan="4">W</td><td rowspan="4">120</td><td rowspan="4">g</td><td rowspan="4">100</td></tr>
<tr><td>Epidemiology I</td><td>L,E,S</td><td>O</td><td>3</td><td>3</td></tr>
<tr><td>Research Methods</td><td>L,E,S</td><td>O</td><td>3</td><td>3</td></tr>
<tr><td>Chronic and Infectious Diseases over the Lifecourse</td><td>L,E,S</td><td>O</td><td>3</td><td>3</td></tr>
<tr><td>Coursework</td><td colspan="9">Presentations, group work, exercises</td></tr>
<tr><td>Transfer</td><td colspan="9">M.Sc. in Population-Based Medicine</td></tr>
</table>

Prerequisites	*None*
Module Leader	*Professor in the PBM department*

4.2. Module Statistics I

Module Code: *PBM-2*	**Module Title:** *Statistics I*		**Type of Module:** obligatory
CP (ECTS Credits)	*6 ECTS*		
Workload - Time in Class - Self-Study	Total Workload: 180 h	Time in Class: 75 h / 5 CH	Self-Study: 105 h
Duration	*1 semester*		
Frequency	*Annually*		
Language of Instruction	*English*		
Forms of Teaching and Learning	*Lectures, individual and small groups work, exercises, presentations*		
Content	• *Measurement systems, data types* • *Probability theory* • *Association analysis and effect sizes* • *Regression analysis: classical linear models* • *Generalized linear models* • *Data types, import and export of data sets* • *Basic data manipulation and preparation* • *Programming and algebraic operations* • *Descriptive statistics, tables, and graphics* • *Analysis of categorical data*		
Objectives	*At the end of the module, participants will be able to:* • *Understand the fundamental principles of probability* • *Understand the structure of measurement systems* • *Assess the validity of measurement tools* • *Interpret the results of regression analysis* • *Use statistical thinking to investigate research hypotheses* • *Understand the principles of structured data* • *Use statistical software to prepare data and perform statistical analysis* • *Demonstrate programming skills in statistical software (SPSS, Stata, R)*		

Assessment: Requirements for Obtaining Credit, Grading, Weight if appl.

	Type of Course	*Status*	*CH*	*CP*	*Type of Exam*	*Length of Exam*	*Type of Evaluation*	*Calculation of Module Grade*
Statistical Methods in Health Research I	*L,E,S*	*O*	*3*	*4*	*W*	*120*	*g*	*100*

	Statistical Software	*L,E,S*	*O*	*2*	*2*				
Coursework	*Exercises, individual and group work, presentations*								
Transfer	*M.Sc. in Population-Based Medicine*								
Prerequisites	*None*								
Module Leader	*Professor in the PBM department*								

4.3. Module Project in Health Systems

Module Code: *PBM-3*	**Module Title:** *Project in Health Systems*		**Type of Module:** obligatory
CP (ECTS Credits)	*6 ECTS*		
Workload - Time in Class - Self-Study	Total Workload: 180 h	Time in Class: 30 h / 2 CH	Self-Study: 150 h
Duration	*1 semester*		
Frequency	*Annually*		
Language of Instruction	*English*		
Forms of Teaching and Learning	*Lectures, individual and small groups work, presentations*		
Content	• *Introduction of different health systems* • *Key components of international health systems* • *Impact of the health system on health outcomes* • *Evaluation and appraisal of health system performance* • *The current and potential future health systems*		
Objectives	*At the end of the module, participants will be able to:* • *Assess the health system performance of different health systems* • *Achieve a basic understanding of the major components of health systems* • *Understand the relations between the different components of health systems and their impact on population health* • *Identify common challenges to health systems* • *Identify a health system problem and develop skills to plan and implement measures which may solve the problem*		

Assessment: Requirements for Obtaining Credit, Grading, Weight if appl.		*Type of Course*	*Status*	*CH*	*CP*	*Type of Exam*	*Length of Exam*	*Type of Evaluation*	*Calculation of Module Grade*
	International Health Systems	*L,S*	*O*	*2*	*3*	*T*	*-*	*g*	*50*
					3	*P*	*-*	*g*	*50*
Coursework	*Individual and group work*								
Transfer	*M.Sc. in Population-Based Medicine*								

Prerequisites	*None*
Module Leader	*Professor in the PBM department*

4.4. Module Biopsychosocial Medicine

Module Code: *PBM-4*	**Module Title:** *Biopsychosocial Medicine*		**Type of Module:** obligatory
CP (ECTS Credits)	*6 ECTS*		
Workload - Time in Class - Self-Study	Total Workload: 180 h	Time in Class: 60 h / 4 CH	Self-Study: 120 h
Duration	*1 semester*		
Frequency	*Annually*		
Language of Instruction	*English*		
Forms of Teaching and Learning	*Lectures, small groups work, presentations*		
Content	• *Fundamental concepts of social and behavioral sciences* • *The biopsychosocial health model* • *Standards of living* • *Socio-economic determinants of health: income, labor, education, family* • *Health inequalities and social support* • *Behavioral modification* • *Health risk perception and relapse* • *Subjective health beliefs* • *Social settings and public health interventions* • *Rehabilitation and disability*		
Objectives	*At the end of the module, participants will be able to:* • *Understand the role of social and behavioral phenomena in population health* • *Describe the relationships between the social and demographic structure and population health* • *Understand the principal theories and models of health psychology* • *Identify the major mental processes related to health beliefs and behavior* • *Describe the impact of psychological mechanisms in the development, treatment, and course of health and illness*		

Assessment: Requirements for Obtaining Credit, Grading, Weight if appl.		*Type of Course*	*Status*	*CH*	*CP*	*Type of Exam*	*Length of Exam*	*Type of Evaluation*	*Calculation of Module Grade*
	Social and Behavioral Medicine	*L,E,S*	*O*	*2*	*3*	*W*	*90*	*g*	*100*

	Health Psychology	*L,E,S*	*O*	*2*	*3*				
Coursework	*Group work, presentations*								
Transfer	*M.Sc. in Population-Based Medicine*								
Prerequisites	*None*								
Module Leader	*Professor in the PBM department*								

4.5. Module Practice of Population-Based Medicine

Module Code: *PBM-5*	**Module Title:** *Practice of Population-Based Medicine*								**Type of Module:** obligatory
CP (ECTS Credits)	*9 ECTS*								
Workload - Time in Class - Self-Study	Total Workload: 270 h		Time in Class: 90 h / 6 CH						Self-Study: 180 h
Duration	*1 semester*								
Frequency	*Annually*								
Language of Instruction	*English*								
Forms of Teaching and Learning	*Lectures, small groups work, presentations, exercises*								
Content	• *Basics and theories of health communication* • *Skills necessary to effectively communicate in health contexts* • *Financing of the health system* • *Cost-benefit analysis* • *Identification of specific health interventions* • *Intervention and implementation methodology* • *Planning health interventions*								
Objectives	*At the end of the module, participants will be able to:* • *Understand the basic principles of health communication* • *Demonstrate competency in the establishment and maintenance of effective relationships in a variety of contexts* • *Describe the basic principles of health economic analysis* • *Apply the principles of health economics in public health interventions* • *Develop skills for health program evaluations and planning of health intervention studies*								
Assessment: Requirements for Obtaining Credit, Grading, Weight if appl.		*Type of Course*	*Status*	*CH*	*CP*	*Type of Exam*	*Length of Exam*	*Type of Evaluation*	*Calculation of Module Grade*
	Health Communication, Knowledge Translation and Public Health Leadership	*L,E,S*	*O*	*2*	*3*	*T*	*-*	*g*	*50*

	Health Policy and Health Economics	*L,E,S*	*O*	*2*	*3*	*P*	*-*	*g*	*50*
	Design of Population-Based Intervention	*L,E,S*	*O*	*2*	*3*				
Coursework	*Group work, exercises, presentations*								
Transfer	*M.Sc. in Population-Based Medicine*								
Prerequisites	*None*								
Module Leader	*Professor in the PBM department*								

4.6. Module Population-Based Medicine II

Module Code: *PBM-6*	**Module Title:** *Population-Based Medicine II*		**Type of Module:** obligatory
CP (ECTS Credits)	*6 ECTS*		
Workload - Time in Class - Self-Study	Total Workload: 180 h	Time in Class: 90 h / 6 CH	Self-Study: 90 h
Duration	*1 semester*		
Frequency	*Annually*		
Language of Instruction	*English*		
Forms of Teaching and Learning	*Lectures, small groups work, presentations, exercises*		
Content	• *Concepts and methods for epidemiology at the intermediate level* • *Causality concepts* • *Biases in epidemiologic research,* • *Longitudinal study designs* • *Evidence-based approach in medicine* • *Systematic review and meta-analysis*		
Objectives	*At the end of the module, participants will be able to:* • *Design, conduct, and analyze epidemiologic studies* • *Choose appropriate study designs to evaluate the interaction of risk factors and protective factors* • *Evaluate causal relationships in different study designs* • *Critically appraise epidemiologic studies, synthesis and integration of epidemiologic research* • *Understand the concept of evidence-based medicine* • *Critically analyze research articles based on levels of evidence* • *Understand the concepts of effect size, evidence level and the process of evidence synthesis*		

Assessment: Requirements for Obtaining Credit, Grading, Weight if appl.	*Type of Course*	*Status*	*CH*	*CP*	*Type of Exam*	*Length of Exam*	*Type of Evaluation*	*Calculation of Module Grade*

	Epidemiology II	*L,E,S*	*O*	*2*	*2*	*W*	*90*	*g*	*100*
	Evidence-Based Medicine	*L,E,S*	*O*	*4*	*4*				
Coursework	*Group work, presentations, exercises*								
Transfer	*M.Sc. in Population-Based Medicine*								
Prerequisites	*Epidemiology I, Research Methods (recommended)*								
Module Leader	*Professor in the PBM department*								

4.7. Module Statistics II

Module Code: *PBM-7*	**Module Title:** *Statistics II*		**Type of Module:** obligatory
CP (ECTS Credits)	*6 ECTS*		
Workload **- Time in Class** **- Self-Study**	Total Workload: 180 h	Time in Class: 90 h / 6 CH	Self-Study: 90 h
Duration	*1 semester*		
Frequency	*Annually*		
Language of Instruction	*English*		
Forms of Teaching and Learning	*Lecture, individual and small groups work, exercises, presentations*		
Content	• *Mixed regression models* • *Survival analysis* • *Advanced categorical data analysis* • *Time-series analysis* • *Psychometrics* • *Introductory concepts in population genetics* • *The role of genetics in human diseases* • *Common topics in bioinformatics* • *Basis concepts and skills to perform computational analysis of biological data*		
Objectives	*At the end of the module, participants will be able to:* • *Conduct advanced regression and survival analyses* • *Use psychometric methods to evaluate and improve questionnaires* • *Acquire the skills to select the appropriate type of statistical analysis for particular data structures* • *Understand patterns of genetic variation within and between populations* • *Describe the processes affecting the distribution of genetic variation in populations*		

Assessment: Requirements for Obtaining Credit, Grading, Weight if appl.		*Type of Course*	*Status*	*CH*	*CP*	*Type of Exam*	*Length of Exam*	*Type of Evaluation*	*Calculation of Module Grade*
	Statistical Methods in Health Research II	*L,E,S*	*O*	*3*	*3*	*W*	*120*	*g*	*100*
	Population Genetics and Bioinformatics	*L,E,S*	*O*	*3*	*3*				
Coursework	*Individual and group work, exercises, presentations*								
Transfer	*M.Sc. in Population-Based Medicine*								
Prerequisites	*Module Statistics I (recommended)*								
Module Leader	*Professor in the PBM department*								

4.8. Module Public Health

Module Code: *PBM-8*	**Module Title:** *Public Health*		**Type of Module:** obligatory
CP (ECTS Credits)	*9 ECTS*		
Workload **- Time in Class** **- Self-Study**	Total Workload: 270 h	Time in Class: 90 h / 6 CH	Self-Study: 180 h
Duration	*1 semester*		
Frequency	*Annually*		
Language of Instruction	*English*		
Forms of Teaching and Learning	*Lectures, small groups work, presentations*		
Content	• *Describe clinical and behavioral features of mental disorders* • *Epidemiology of mental health disorders* • *Basic concepts, strategies and methods of health promotion and disease prevention* • *Lifestyle behaviors, health promotion and disease risk* • *Principles of risk assessment* • *Epidemiology of occupational and environment-related risk factors and diseases* • *Workplace related stress*		

<table>
<tr><td>Objectives</td><td colspan="8">At the end of the module, participants will be able to:
Understand the main diagnostic criteria of mental disorders
Recognize and describe risk and protective factors of mental health
Assess the burden of mental disorders in and across populations
Appraise the adequacy of public mental health programs
Assess the efficacy of lifestyle interventions to promote health
Describe the principles of occupational and environmental health
Assess the health risks associated with occupational and environmental exposures</td></tr>
<tr><td rowspan="4">Assessment: Requirements for Obtaining Credit, Grading, Weight if appl.</td><td></td><td>Type of Course</td><td>Status</td><td>CH</td><td>CP</td><td>Type of Exam</td><td>Length of Exam</td><td>Type of Evaluation</td><td>Calculation of Module Grade</td></tr>
<tr><td>Public Mental Health</td><td>L,E,S</td><td>O</td><td>2</td><td>3</td><td rowspan="3">W</td><td rowspan="3">120</td><td rowspan="3">g</td><td rowspan="3">100</td></tr>
<tr><td>Lifestyle Behaviors, Health Promotion and Disease Prevention</td><td>L,E,S</td><td>O</td><td>2</td><td>3</td></tr>
<tr><td>Occupational and Environmental Health</td><td>L,E,S</td><td>O</td><td>2</td><td>3</td></tr>
<tr><td>Coursework</td><td colspan="8">Group work, presentations</td></tr>
<tr><td>Transfer</td><td colspan="8">M.Sc. in Population-Based Medicine</td></tr>
<tr><td>Prerequisites</td><td colspan="8">None</td></tr>
<tr><td>Module Leader</td><td colspan="8">Professor in the PBM department</td></tr>
</table>

4.9. Module Practicum

<table>
<tr><td>Module Code:
PBM-9</td><td colspan="2">Module Title:
Practicum</td><td>Type of Module:
obligatory</td></tr>
<tr><td>CP
(ECTS Credits)</td><td colspan="3">30 ECTS</td></tr>
<tr><td>Workload
- Time in Class
- Self-Study</td><td>Total Workload:
900 h</td><td>Time in Class:
15 h / 1 CH</td><td>Self-Study:
885</td></tr>
<tr><td>Duration</td><td colspan="3">1 semester</td></tr>
<tr><td>Frequency</td><td colspan="3">Annually</td></tr>
<tr><td>Language of Instruction</td><td colspan="3">English</td></tr>
<tr><td>Forms of Teaching and Learning</td><td colspan="3">Practical work, project, presentations</td></tr>
</table>

<table>
<tr><td>Content</td><td colspan="8">The practicum is a core element of the Master of PBM curriculum. It provides an opportunity for each student to work in a health setting that carries the responsibility to apply practical skills through a practice experience. The module is designed to provide students with the opportunity to examine an interdisciplinary problem in depth and propose a solution to the problem by applying technical knowledge and skills obtained in their program to a real-world issue. Students will meet with a mentor already in the first and second semester to prepare their practicum and practicum project and present their research program and question (online) at the beginning and end of the practicum and will provide a written report at the end of the practicum.
The practicum in national institutions (e.g., health insurance companies), international NGO‘s (e.g., EUPHA, Platform on Diet and Physical Activity), international organizations (e.g., WHO, EU), research institutions, and other relevant health care organizations and research settings is a required component of the Master’s degree.</td></tr>
<tr><td>Objectives</td><td colspan="8">At the end of the module, participants will be able to:
Develop specific research questions and use appropriate strategies to answer those questions
Identify and manage research challenges
Apply knowledge through problem solving abilities in a new environment within a broader context
Perform effectively in interprofessional teams
Acquire first-hand experience working in public health, health promotion, health research, and private sector agencies
Summarize and interpret results in a brief report</td></tr>
<tr><td rowspan="5">Assessment: Requirements for Obtaining Credit, Grading, Weight if appl.</td><td></td><td>Type of Course</td><td>Status</td><td>CH</td><td>CP</td><td>Type of Exam</td><td>Length of Exam</td><td>Type of Evaluation</td><td>Calculat ion of Module Grade</td></tr>
<tr><td>Practicum</td><td>P</td><td>O</td><td>-</td><td>20</td><td rowspan="3">Pj</td><td rowspan="3">-</td><td rowspan="3">g</td><td rowspan="3">100</td></tr>
<tr><td>Practicum Project</td><td>Pj</td><td>O</td><td>-</td><td>9</td></tr>
<tr><td>Meetings and seminar</td><td>S</td><td>O</td><td>1</td><td>1</td></tr>
<tr><td></td><td colspan="8">Completion of a 14-week long full-time practicum, scientific project report on practicum project (graded), preparation of practicum project in practicum meetings and presentation of practicum project in the practicum seminar (pass-fail graded)</td></tr>
<tr><td>Transfer</td><td colspan="8">M.Sc. in Population-Based Medicine</td></tr>
<tr><td>Prerequisites</td><td colspan="8">None</td></tr>
<tr><td>Module Leader</td><td colspan="8">Professor in the PBM department</td></tr>
</table>

4.10. Module Master’s Thesis

Module Code: *PBM-10*	**Module Title:** *Master’s Thesis*	**Type of Module:** Obligatory
CP (ECTS Credits)	*30 ECTS*	

<table>
<tr><td>Workload
- Time in Class
- Self-Study</td><td>Total Workload:
900 h</td><td>Time in Class:
30 h / 2 CH</td><td>Self-Study:
870 h</td></tr>
<tr><td>Duration</td><td colspan="3">1 semester</td></tr>
<tr><td>Frequency</td><td colspan="3">Annually</td></tr>
<tr><td>Language of Instruction</td><td colspan="3">English</td></tr>
<tr><td>Forms of Teaching and Learning</td><td colspan="3">Research & Practical work, Colloquium</td></tr>
<tr><td>Content</td><td colspan="3">The Master’s Thesis might build on contents that students developed in some of the earlier courses or the practicum.</td></tr>
<tr><td>Objectives</td><td colspan="3">At the end of the module, participants will be able to:
Develop an own research project idea
Apply and demonstrate their knowledge, understanding, and problem-solving abilities in a research or practical context
Independently plan, conduct and document a research process
Present their research in oral and written form</td></tr>
<tr><td>Assessment: Requirements for Obtaining Credit, Grading, Weight if appl.</td><td colspan="3"><table>
<tr><th></th><th>Type of Course</th><th>Status</th><th>CH</th><th>CP</th><th>Type of Exam</th><th>Length of Exam</th><th>Type of Evaluation</th><th>Calculation of Module Grade</th></tr>
<tr><td>Master’s Thesis</td><td>MT</td><td>O</td><td>-</td><td>24</td><td>MT</td><td>-</td><td>g</td><td>80</td></tr>
<tr><td>Colloquium</td><td>Co</td><td>O</td><td>2</td><td>6</td><td>O</td><td>30</td><td>g</td><td>20</td></tr>
</table></td></tr>
<tr><td>Transfer</td><td colspan="3">M.Sc. in Population-Based Medicine</td></tr>
<tr><td>Prerequisites</td><td colspan="3">PBM-1, PBM-2, PBM-6, PBM-7 (obligatory)</td></tr>
<tr><td>Module Leader</td><td colspan="3">Professor in the PBM department</td></tr>
</table>