

Scholars in HeAlth Research Program (SHARP)

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Background

The Scholars in HeAlth Research Program is a joint FM and FHS graduate program that consists of a 12-credit summer certificate as well as a 40-credit master's degree. The summer program and the MS degree are open to graduates of health fields. Social scientists and humanities graduates interested in Non-Communicable Diseases (NCD) can also enroll in the program, provided they fulfill admission and selection criteria and have the necessary background to follow the course curriculum. Credits earned for the SHARP certificate can be credited towards the Master of Science in Health Research requirements. These credits can also be credited in full or partly towards other post-graduate degrees at FM, FHS, FAFS, or HSON and possibly at other institutions.

SHARP provides graduates with the required foundation to pursue a career in clinical and translational research. Although focused on NCD, a major cause of mortality and morbidity in the region, the garnered skills are applicable to other areas of clinical research. The Program helps create and sustain a cadre of highly trained researchers who conduct patient-oriented and population-oriented studies on NCD. It also equips trainees with management and leadership skills needed to become “change agents” and lead research groups, academic departments or other health care settings. Management and leadership courses are offered in collaboration with faculty at the Olayan School of Business.

Mission

The Mission of the Scholars in HeAlth Research Program (SHARP) at the American University of Beirut (AUB) is “To provide superior didactic education complemented with state-of-the-art interactive and practical training in health research, with a focus on Non-Communicable Diseases research. It is intended for physicians and other health care professionals, to improve and advance the health care agenda for Non-Communicable Diseases in Lebanon and the region.”

SHARP Summer Certificate Program Curriculum

The SHARP summer session is a 12-credit module that provides the essential foundations in quantitative methods and fundamental skills to conduct research. The core disciplines covered include epidemiology, biostatistics, research ethics and library sciences/informatics. These are complemented with a practical hands-on training course in the analysis and reporting of large health-related datasets in NCD.

SHARP Master of Science in Health Research

Admission to the Program

The application deadline for the summer certificate is in April, and the acceptance is in May of each academic year calendar. The application deadline for the MS degree in Health Research is in June, and the deadline for acceptance is in July of each academic year calendar. The SHARP summer certificate is a prerequisite for the SHARP MS program, and the performance in the summer certificate is evaluated to ensure the candidate is suitable for continuing on the MS path. Students should apply to the MS program by early June and are accepted upon successful completion of the summer certificate program (minimum GPA of 80 over 100). The program thus consists of the June-July summer certificate and then is followed by a 1-year or 2-year MS track that begins in September. While the 2-year program is approved for all, the 1-year program is approved by the Lebanese Ministry of Education for medical doctors only. For more details, please refer to the Admissions section of the AUB graduate catalogue, page 35.

Criteria for Admission

All applicants to the SHARP summer certificate program and the Master of Science in Health Research must satisfy the criteria established at AUB for enrollment into a master's degree program, namely the Readiness for University Studies in English (RUSE) (see page 42 of this catalogue) and a minimum degree of BS with a minimum average of 80 or its equivalent.

In addition, applicants should express/demonstrate commitment to a career in NCD research in the statement of purpose submitted along with their application.

Applications for the summer program are reviewed by the SHARP executive committee.

Applications for the MS program are reviewed by the joint FM/FHS Graduate Studies Committee.

The Application Process

An applicant is considered for admission to the SHARP summer program and the MS program if s/he meets the following minimum admission requirements:

- an undergraduate cumulative average of at least 80 (or standardized equivalent from other institutions of higher learning) leading to a bachelor's degree or its equivalent from recognized institutions of higher learning
- at least two letters of recommendation
- a statement of purpose (500-word limit) indicating the purpose for applying to the program and specifying the applicant's research interests and/or practical experience

Applicants to any graduate program, other than AUB graduates and graduates of recognized colleges or universities in North America, Great Britain, Australia and New Zealand must demonstrate proficiency in the English language. See Admissions section in this catalogue, page 35.

Graduation Requirements

See General University Academic Information in this catalogue, page 52.

Incompletes

See General University Academic Information in this catalogue, page 52.

Probation

See General University Academic Information in this catalogue, page 52.

Program Outline

The 40-credit master's degree requirements can be completed over one full-time year (available to Doctor of Medicine graduates only) or two part-time years. The total number of allowed credits per term is 16 unless otherwise approved by the joint FM/FHS Graduate Studies Committee. The degree consists of the 12-credit summer program in addition to 15 credits in required courses, the 4-credit Longitudinal Seminar series spanning the Fall-Spring academic year, 3 credits of electives and 6 credits for the thesis. The thesis is a mentored research project culminating in the completion of a project revolving around Non-Communicable Diseases. In compliance with AUB requirements, scholars must also sit for a 0-credit comprehensive exam (Pass/Fail) during their last term.

Program Delivery

The 40-credit program is divided as indicated below:

- **Intensive Introductory Summer Certificate Program:** The seven-week program (June–July) consists of five courses: Biostatistics (4 cr.), Principles of Epidemiology (4 cr.), Introduction to Research Ethics and Responsible Conduct of Research (1.5 cr.), Analysis and Reporting of Large Clinical Datasets (2 cr.) and Library Science/Informatics (0.5 cr.). These courses consist of didactic lectures, faculty-facilitated discussion groups, laboratory sessions and group projects. The courses in epidemiology and biostatistics are held in conjunction with the Faculty of Health Sciences (FHS), while the Introduction to Research Ethics and Responsible Conduct of Research is held in conjunction with the Salim El-Hoss Bioethics and Professionalism Program (SHBPP).
- **Courses and Longitudinal Clinical Research Seminar Series:** Students are required to take a total of 15 credits in required courses, 3 credits of elective courses and to participate in a 4-credit weekly longitudinal seminar course spanning 2 terms within a format that allows for interdisciplinary thought and interaction among academics, scientists and government officials via various teaching modalities (e.g., lecture, case study and student-led presentations).
- **Thesis:** Each student is required to select a clinical research project and identify advisor(s) from among the Faculty of Medicine (FM) and FHS faculty engaged in clinical research. Mentors and projects are approved by the joint FM/FHS Graduate Studies Committee (GSC). For those pursuing the 2-year track, the research project typically begins in the Spring term of the student's first year and culminates in a thesis document and oral thesis defense delivered before the end of the second academic year. For those choosing the 1-year track, the process begins early in the Fall term and ends in the Spring term of the same academic year. All projects are supervised by a thesis committee.

Comprehensive Examination

Each student is expected to pass a 0-credit comprehensive examination course after completion of all required courses. If a student does not pass the comprehensive exam, s/he is allowed to take it a second time in the following term as per AUB regulations. The Comprehensive Examination has a Pass (P) or Fail (F) format, and timing of the examination is set by the program.

Tracks

Master of Science: 1-Year Program

Summer- 12 credits	Course Title	Faculty	Credits
Principles of Epidemiology/ Design and Analysis of Epidemiological Studies	SHARP 300/320	SHARP	4 credits
Basic Biostatistics	SHARP 310	SHARP	4 credits
Introduction to Research Ethics and Responsible Conduct of Research	SHARP 315	SHARP	1.5 credits
Analysis and Reporting of Large Clinical Datasets	SHARP 330	SHARP	2 credits
Library Science /Informatics	SHARP 325	SHARP	0.5 credits

Fall – 17 credits	Course Title	Faculty	Credits
Design and Analysis of Clinical Trials	EPHD 321	FHS	2 credits
Clinical Trial Protocol	SHARP 321A	SHARP	2 credits
Leadership and Behavior in Organizations	MNGT 306	OSB	3 credits
Thesis	SHARP 400	SHARP	6 credits
Longitudinal Seminar Series (LSS) I	SHARP 350A	SHARP	2 credits

Spring – 11 credits	Course Title	Faculty	Credits
Systematic Review and Meta- Analysis	EPHD 328	FHS	3 credits
Public Health Policy and Advocacy	PBHL 304	FHS	3 credits
Longitudinal Seminar Series (LSS) II	SHARP 350B	SHARP	2 credits
Comprehensive Examination	SHARP 395A	-	0 credits
Elective*	-	-	3 credits
Advances in NCD Research**	SHARP 340	SHARP	2 credits
Thesis	SHARP 400A	SHARP	0 credits

*) MS students are required to take a total of 3 credits as electives. They may take one course for 3 credits, or two courses for 1 credit and 2 credits each.

**) Given in Spring term once every 2 years.

Master of Science: 2-Year Program

Summer- 12 credits	Course Title	Faculty	Credits
Principles of Epidemiology/ Design and Analysis of Epidemiological Studies	SHARP 300/320	SHARP	4 credits
Basic Biostatistics	SHARP 310	SHARP	4 credits
Introduction to Research Ethics and Responsible Conduct of Research	SHARP 315	SHARP	1.5 credits
Analysis and Reporting of Large Clinical Datasets	SHARP 330	SHARP	2 credits
Library Science/informatics	SHARP 325	SHARP	0.5 credits
Fall I – 6 credits	Course Title	Faculty	Credits
Design and Analysis of Clinical Trials	EPHD 321	FHS	2 credits
Clinical Trial Protocol	SHARP 321A	SHARP	2 credits
Longitudinal Seminar Series (LSS) I	SHARP 350A	SHARP	2 credits
Spring I – 11 credits	Course Title	Faculty	Credits
Systematic Review and Meta- Analysis	EPHD 328	FHS	3 credits
Longitudinal Seminar Series (LSS) II	SHARP 350B	SHARP	2 credits
Thesis	SHARP 400	SHARP	6 credits
Fall II – 6 credits	Course Title	Faculty	Credits
Leadership and Behavior in Organizations	MNGT 306	OSB	3 credits
Thesis	SHARP 400A	SHARP	0 credits
Elective*	-	-	3 credits
Spring II – 5 credits	Course Title	Faculty	Credits
Public Health Policy and Advocacy	PBHL 304	FHS	3 credits
Advances in NCD Research**	SHARP 340	SHARP	2 credits
Thesis	SHARP 400B	SHARP	0 credits
Comprehensive Examination	SHARP 395A/B	-	0 credits

*) MS students are required to take a total of 3 credits as electives. They may take one course for 3 credits, or two courses for 1 credit and 2 credits each.

**) Given in Spring term once every 2 years.

Course Descriptions

Required Courses

SHARP 300 Principles of Epidemiology 2 cr.
A course in principles, concepts and application of epidemiology tools relevant to public health and clinical practice. The course covers basic principles of epidemiology related to disease occurrence, distribution and determinants. Topics include rubrics of epidemiology, morbidity and mortality measures, sources of data, epidemiologic study (cross-sectional, case-control, cohort studies and clinical trials), casual inference and causation in epidemiology. The course consists of lectures, assigned readings and complementary practical sessions. *Offered only in Summer. Equivalent to EPHD 300.*

SHARP 320 Design and Analysis of Epidemiological Studies 2 cr.
The course covers in detail methodological issues related to study design and conduct, data analysis, interpretation of results and inference in epidemiological research. Problems of exposure and disease definitions, information and selection biases, confounding and effect modification are considered. Students are required to critique and discuss epidemiological studies and to lead in the write-up of a research study protocol for design and conduct of an epidemiologic study. *Offered only in Summer. Equivalent to EPHD 320. Equivalence to be discussed with FHS on a case-by-case basis and as needed.*

SHARP 310 Basic Biostatistics 4 cr.
This course is an introduction to basic statistical techniques applied to health sciences and related fields. The objectives are twofold: descriptive statistics, which encompass techniques for organizing and summarizing data, and inferential statistics, from estimation to confidence interval and testing of hypotheses. Applications include probability distribution, comparing population means (t-tests) or proportions (X² squares) for data obtained from paired or independent samples, significance testing, sample size calculation and power, stratified and matched analyses, and one-way ANOVA. Also, it introduces simple linear regression, correlations, logistic regression and nonparametric methods for data analysis. Focus will be on problems that are commonly encountered in health services and biomedical research. *Offered only in Summer. Equivalent to EPHD 310.*

SHARP 315 Introduction to Research Ethics and RCR 1.5 cr.
This course introduces students to the fundamentals of responsible conduct of research, emphasizing the ethical practice of human and animal research. The course recaps the history of ethical principles and the development of research codes of conduct and ethical practices, familiarizes investigators and faculty members with the different kinds of ethical issues that they might come across throughout their careers, and allows scholars to reflect critically about what it means to be an ethical and responsible researcher. In RE & RCR, students will attend lectures, participate in discussions, analyze actual case studies and watch audio-visual material. Most importantly, they will know how to conduct and assess research from an ethical standpoint. *Offered only in Summer.*

SHARP 325 Library Science/Informatics 0.5 cr.
 This introductory course spans five 2 hours sessions, and focuses on effective and efficient searching skills of the various medical and health-related bibliographic databases. It also includes an introduction to the evidence-based practice concept and where and how to locate such documents, in addition to how to design a high sensitive search strategy for systematic reviews. Delivery of this course is through a mixture of live demonstration, hands-on exercises, and solving clinical scenarios. *Offered only in Summer.*

SHARP 330 Analysis and Reporting of Large Clinical Datasets I 2 cr.
 This course will put into practice the statistical analysis and other computing skills introduced to scholars in EPHD 300/SHARP 300, EPHD 310/SHARP 310 and SHARP 325. The training format is a mixture of demonstrations, hands-on exercises and clinical scenarios. The course will simulate previously executed/published analyses on previously collected de-identified health research datasets. Scholars will go through the entire process experience of data handling, hypothesis-driven analysis design and culminate in the execution of statistical analysis (modeling) and presentation of results. In addition, this course will use existing datasets to familiarize scholars with commonly used health data analysis methods including survival analysis methodology and Cox regression multivariate modeling of survival data, and finally introduce propensity score approaches for risk-adjustment. *Offered only in Summer.*

SHARP 340 Advances in Non-Communicable Diseases Research 2 cr.
 The course examines a number of selected non-communicable diseases (NCD) given their morbidity and mortality burden at the local and regional level. Expert guest speakers are invited to discuss the public health importance of the topic/its burden; epidemiology (prevalence, patterns, determinants); theoretical and practical methodological challenges and opportunities in the conduct of epidemiologic studies; most recent findings in NCD research conducted in Lebanon and the region; and strategies for the prevention and control of NCDs. The course is an opportunity for students to be acquainted with researchers in Lebanon active in the field and to appreciate the scope and findings of the NCD studies conducted in Lebanon and the region. Students are expected to lead on a scoping review of a selected research question. *Offered in Spring every 2 years.*

EPHD 321 Design and Analysis of Clinical Trials 2 cr.
 A course that focuses on issues in the design and organization of randomized controlled clinical trials: ethical and legal issues, patient selection, recruitment, masking and randomization, endpoint definition, protocol development and statistical analysis.

SHARP 321A Clinical Trial Protocol 2 cr.
 This is a 2-credit course designed to complement EPHD 321 (Design and Analysis of Clinical Trials). It is structured around the development of a clinical trial protocol based on principles/concepts covered in parallel in EHPD 321. The course systematically covers all standard key items needed to describe a clinical trial protocol using the 33 items checklist of the 2013 SPIRIT (Standard Protocol Items: Recommendations for Intervention Trials) document. These items include detailed content description for: administrative information, protocol registration, participants, interventions, outcomes, assignment of interventions, data collection, data management, data analysis, monitoring, data sharing, ethics and dissemination. Weekly assignments are designed to guide students in the production of a clinical trial protocol, covering sequential items of the SPIRIT checklist. The final paper consists of a fully developed protocol to implement a clinical trial that is suitable for submission for competitive funding and for publication in a peer-

reviewed journal. Students will also give a PowerPoint presentation at the end of the course describing the protocol developed prior to submission of their final paper.

EPHD 328 Systematic Review and Meta-Analysis 3 cr.
The course is structured around the steps of executing a systematic review of trials of interventions: specifying the PICO question, searching for potentially relevant articles, selecting eligible studies, abstracting data, assessing risk of bias, conducting a meta-analysis, grading the quality of evidence and interpreting results. Weekly assignments are designed to guide students in the production of a systematic review. The final paper consists of a report of the systematic review suitable for publishing in a peer-reviewed journal. The course examines advances in Non-Communicable Disease (NCD) research and risk factors with special focus on methodological challenges and opportunities.

SHARP 350 A/B Longitudinal Research Seminar Series I/II 4 cr.
The Seminar Series covers a variety of topics not fully covered in other courses but key to the career development of health research investigators. It is comprised of seminars, lectures, workshops and Journal Clubs organized by the collaborating schools, including the Human Research Protection Program (HRPP) and the Research Education Unit, and by the Centre for Research on Population and Health (CRPH) at FHS. Invited speakers from AUB or local/regional/international institutions will cover research ethics (part of the Ethics Matters Initiative weekly seminars), NCD-research seminars, and cutting edge research on population, health and socioeconomic issues in Lebanon and the region. The seminars will also include a mock study section grant review, presentations by successful investigators at AUB or AUB Alumni, or by leadership in the healthcare industry and funding agencies. The first term is formatted as a series of separate but related seminars, whereas in the second term, the scholars will participate in these seminars through presentations of practicums, progress reports on their on-going projects and seminars on special issues relating to their research projects.

MNGT 306 Leadership and Behavior in Organizations 3 cr.
An analytical excursion into the behavioral aspects of the modern workplace, including such processes as leadership, communication, motivation, conflict resolution and team building. Particular attention is accorded to leadership as a focal point of group processes and as a critical ingredient in successful organizational endeavors and transformations.

PBHL 304 Public Health Policy and Advocacy 3 cr.
This course introduces students to the relevant concepts and approaches in public health policy and advocacy. It will provide students with a basic understanding of the public health policymaking process as well as the basic elements of advocacy. The aim is to make MPH students informed of the complex nature about public health policy development, be critical consumers of health policy research and evidence, and analytical of the influence of various actors on the policy. Students will learn the stages of the policy process (i.e., agenda setting, policy development, policy implementation and policy evaluation). The field draws upon numerous disciplines. As such, course readings will be drawn from political science, sociology, biomedical sciences and policy studies. Students will also cover the basic elements of an advocacy process, including defining the issue, understanding the audiences and crafting advocacy strategies. Case studies, class discussions, and guest speakers will provide tangible examples of public health policy and advocacy processes at the national, regional and international levels. Ethics and equity considerations will be included in discussions related to concepts and application.

SHARP 395A Comprehensive Examination 0 cr.
 Each student is expected to pass a comprehensive examination after completion of all required courses. Examinations may be written, oral or both. Timing of the examination is set by the program.

SHARP 400 Research Thesis 6 cr.
 This is a 6-credit master's research course generally completed over two-three terms or more, after the SHARP required summer certificate program. The thesis research track for the SHARP MS degree program will be flexible provided its primary focus is related to NCD. The focus would be clinical trial based, or pertaining to NCD related outcomes or clinical epidemiology, or to the formulation of a health policy related to NCD. A meta-analysis is allowed as a thesis topic pending approval of the joint FM/FHS GSC. A passing grade on the comprehensive exam is also required and it will be followed by a thesis defense and document submission as required by AUB academic guidelines.

Electives

SHARP MS students are allowed a total of 3 credits of electives that can be taken either as established offered courses at any of the following faculties: FM, FHS, OSB, FAFS and HSON (including those listed below), or as tutorials (2-3 credits) and seminars (1 credit), provided they are post-graduate courses and are approved by the SHARP Director.

SHARP 331 Analysis and Reporting of Large Clinical Datasets II 2 cr.
 This course, in large part, takes the form of a single trainee research project on a clinical dataset that is done with direct supervision of the course coordinator/instructor and possibly SHARP investigators and mentors. Proposed research questions/projects are expected to be sufficiently novel, of clinical relevance, with well-designed and executed analyses that have publication potential. Students are expected to submit their work in abstract form to a scientific conference, present their work internally as a seminar and work toward a manuscript.

SHARP 500 Elective in Research Ethics and RCR 1 cr.
 The course is offered by the Salim El-Hoss Bioethics and Professionalism Program. This program organizes an average of 1-2 regional two-day conferences, and two national one-day conferences each year. Students will have to attend one regional two-day conference or two national one-day conferences of their choice. Topics of previous years included Controversies in Research Ethics; Public Health- An Ethical Imperative; Ethics of Organ Donation; Stem Cell Research: Current Controversies; Ethics and Medical Reliability.

EPHD 324 Special Topics in Biostatistics 1-3 cr.
 A course that covers selected topics in biostatistics of special interest to researchers and trainees in epidemiology and population health. *Prerequisite: EPHD 310 or consent of instructor.*

EPHD 312 Analysis of Continuous Data 3 cr.
 A course that deals with concepts and methods for the analysis of continuous outcomes. The main focus is on multiple linear regression. Analytical means to control for confounding and effect modification while maximizing precision is explored. The methods of regression diagnostics are explained. Basic theory is considered; however, the emphasis is on application. Applications of the statistical techniques are carried out using the statistical package SPSS. *Prerequisite: EPHD 310 or consent of instructor.*

EPHD 313 Analysis of Categorical Data 3 cr.
 A course that covers univariate and multivariate statistical techniques for categorical data. Topics include distributions; measures of association and inference for categorical data; log-linear models for multicontingency tables; and logistic regression for binary, polytomous and ordinal responses. In addition, the concept of maximum likelihood estimation is introduced. Applications of the statistical techniques are carried out using the statistical package STATA. *Prerequisite: EPHD 310 or consent of instructor.*

HPCH 334 Qualitative Health Research 2 cr.
 A course in which students advance their qualitative social research methodology and methods for public health research. Students revisit the underlying paradigms and use of qualitative methodology. Throughout this course, students refine their interviewing skills, train on how to manage qualitative data, apply systematic data analysis and produce a rigorous account of qualitative research findings through practical applications in Arabic and English. *Prerequisite: PBHL 310 or similar research design course or consent of instructor.*

HMPD 300 Health Care Systems 3 cr.
 This course deals with all the main components, resources and functions of health care systems. It is designed for graduate students to identify organizational and health system problems and apply systems thinking in resolving them. The course also introduces graduate students to the policy making and analysis of health system issues with particular focus on Lebanon and the Middle East region.

PBHL 310 Research Design 3 cr.
 This course discusses principles of research design and the methods used in both quantitative and qualitative social research methodologies. Topics include formulation of research questions, literature review, sampling issues, methods of data collection and analysis. Practical ethical issues are also discussed.

HMPD 314 Project Management 2 cr.
 A course that exposes students to current project management trends, best practices, and strategies that can aid in better management of projects and programs in health care settings.

BIOM 375 Principles of Learning and Assessment 2 cr.
 This course provides students with the theoretical background and approaches to teaching science at the university level with emphasis on the nature of science and learner cognition. In addition, students are expected to apply principles and techniques of teaching and assessment of science in a teaching context. *Course offered to PhD students in Biomedical Sciences.*