General Scientific Methods in Medical Science, 15 credits

Allmänvetenskaplig forskningsmetodik i medicinsk vetenskap (15 högskolepoäng)

| Course Code/Codes | 1. Course code 70ME057, General Scientific Methods in Medical Science, Individual written exam, 5 credits
|                   | 2. Course code 70ME060, General Scientific Methods in Medical Science, Research poster, 2.5 credits
|                   | 3. Course code 70ME061, General Scientific Methods in Medical Science, Report, 7.5 credits |
| Subject Area      | Medicine |
| School/equivalent | School of Health and Medical Sciences (IHM) |
| Valid from        | 2014-08-18 |
| Approved          | 2014-06-27 |
| Revised           | - |
| Approved by       | Head of School |
| Translation to English, date and signature | 2014-06-26 CHK |

1 Course content

The following topics are discussed on the course:
- Scientific writing and research communication
- Research ethics and disciplinary rectitude
- Research design, quantitative and qualitative research methods
- Philosophy of science

2 Outcomes

2.1 The course in relation to the doctoral programme

The course shall primarily refer to the following intended learning outcomes for third-cycle courses and study programmes as described in the Higher Education Ordinance, i.e. the doctoral student shall demonstrate:

Knowledge and understanding
- familiarity with research methodology in general (part of outcome 2)

Competence and skills
- the capacity for scholarly analysis and synthesis (part of outcome 3)
- the capacity to review and assess new and complex phenomena, issues and situations autonomously and critically (part of outcome 3)
- the ability to review and evaluate research and other qualified tasks (part of outcome 4)
- the ability in both national and international contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community and society in general (outcome 6)

**Judgement and approach**
- intellectual autonomy and disciplinary rectitude (part of outcome 9)
- the ability to make assessments of research ethics (part of outcome 9)
- specialised insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used (outcome 10)

The intended learning outcomes are listed in the same order as in the general syllabus for the programme.

### 2.2 Intended course learning outcomes

To obtain a passing grade, the doctoral student shall demonstrate:

- **C1:** the ability to explain, analyse and discuss fundamental descriptive biostatistics, epidemiology as well as qualitative methods for data collection and analysis,

- **C2:** the ability to analyse and argue in favour of different types of study design as well as an understanding of the research process, from design to analysis and the interpretation of the findings,

- **C3:** the ability to identify and discuss aspects of research ethics in medical research,

- **C4:** the ability to communicate research, clearly and expediently,

- **C5:** the ability to discuss and assess aspects of philosophy of science and ethics in relation to his/her own research domain,

- **C6:** the ability to retrieve and use, autonomously, relevant literature, and

- **C7:** the ability to formulate issues and integrate knowledge of philosophy of science, research ethics, research methodology and disciplinary rectitude in a written report in relation to his/her own research domain and relevant literature, as well as display the ability to summarise, reflect on and discuss his/her own and fellow students’ reports, from a scientific point of view.

### 3 Reading list and other teaching material

The following course readings and teaching material will be used on the course:

Each item on the following reading list refers to the latest edition.

- **Bland, Martin.** *An Introduction to Medical Statistics.* Oxford University Press.


- **Ludvigsson, Jonas F.** *Att börja forska - inom medicin och vårdvetenskap.* Studentlitteratur. Lund.

- **Patton, Michael Quinn.** *Qualitative Research & Evaluation Methods.* Sage Publication, Inc.


- **Sohlberg, Peter & Sohlberg Britt-Marie.** *Kunskapens former. Vetenskapsteori och forskningsmetod.* Liber.

- **Trefil James.** *Science in World History.* Routledge
4 Teaching formats

Teaching on the course takes the following format:

Lectures
Seminars
Group discussions
Oral presentations
Independent study

5 Examination

The course is assessed through the following examinations which will be graded separately:

1. Course code 70ME057
   General Scientific Methods in Medical Science, Individual written exam, 5 credits
   The exam is designed for the doctoral student to demonstrate his/her knowledge of qualitative and quantitative research methods, study design and epidemiology. Assesses intended course learning outcomes C1 and C2 and consequently parts of the following intended learning outcomes as specified in the Higher Education Ordinance: D2, D3, D9, and D10.

2. Course code 70ME060
   General Scientific Methods in Medical Science, Research poster, 2.5 credits
   The examination consists of two examination components:
   a) Research poster intended for an international target group.
   b) Participation at a seminar on research posters, contributing as a student reviewer with a thoroughly substantiated analysis of an assigned part of the material presented at the seminar. Assesses intended course learning outcome C4 and consequently parts of the following intended learning outcomes as specified in the Higher Education Ordinance: D2, D3, D4, and D6.

3. Course code 70ME061
   General Scientific Methods in Medical Science, Report. 7.5 credits
   The examination consists of two examination components:
   a) Written report including a popular-science summary, aspects of philosophy of science, research methods, research ethics and disciplinary rectitude in relation to the student’s own research domain.
   b) Participation at a seminar on the scientific report, contributing as a student reviewer with a thoroughly substantiated analysis of an assigned part of the material presented at the seminar. Assesses the intended course learning outcomes C1, C2, C3, C5, C6, C7 and consequently parts of the following intended learning outcomes as specified in the Higher Education Ordinance: D2, D3, D4, D6, D9, and D10.

For examinations consisting of several examination components, the following applies: If during the course it is concluded that a doctoral student is unable to complete a certain examination component, the examiner may set a substitute assignment provided that circumstances do not reasonably allow for the course component to be completed at a later date during the run of the course.

6 Grades
Examinations on third-cycle courses and study programmes are to be assessed according to a two-grade scale with either of the grades ‘fail’ or ‘pass’ (local regulations).

The grade shall be determined by a teacher specifically nominated by the higher education institution (the examiner) (Higher Education Ordinance).

To obtain a passing grade on examinations included in the course, the doctoral student is required to demonstrate that he/she attains the intended course learning outcomes as described in section 2.2. Alternatively, if the course consists of multiple examinations generating credit, the doctoral student is required to demonstrate that he/she attains the outcomes that the examination in question refers to in accordance with section 5.

A student who has failed an examination is entitled to a retake.

If an examination consists of several examination components, and a student fails an examination component, the examiner may, as an alternative to a retake, set a make-up assignment with regard to the examination component in question.

A doctoral student who has failed an examination twice for a specific course or course element is entitled, upon his/her request, to have another examiner appointed to determine the grade.

## 7 Admission to the course

### 7.1 Admission requirements

To gain access to the course and complete the examinations included in the course, the applicant must be admitted to a doctoral programme at Örebro University.

### 7.2 Selection

Selection between applicants who have been admitted to doctoral programmes at Örebro University and who otherwise meet the admission requirements as listed above is made according to the following order of precedence:

1. Applicants admitted to doctoral programmes within the faculty of medicine and health
2. Applicants admitted to doctoral programmes within other faculties at Örebro University

If no other selection criteria are specified in this section, priority shall be given to applicants with a lower number of course credits left before the award of their degree over applicants with a higher number of remaining course credits. Should two or more students have equal number of credits, selection will be done through the drawing of lots. This also applies within any selection groups listed unless otherwise stated.

### 7.3 Other applicants than doctoral students admitted at Örebro University

Other applicants than doctoral students admitted at Örebro University may be given access to the course on the grounds of provisions for and/or agreements regarding contracted courses, joint degrees, national graduate schools or cooperation in other respects with other universities.

Any decisions on what such other applicants may be given access to the course are made separately and on the basis of the provisions and/or agreements that occasion the student to apply for the course.
8 Transfer of credits for courses, study programmes and other experience

Provisions on the transfer of credits can be found in the Higher Education Ordinance and on the university’s webpage.

9 Other information

The language of tuition on the course is alternately Swedish and English. Information on when the course is offered in what language can be obtained from the study and research administrator.

The course is offered on-campus, with the lecturer-led components concentrated to a number of intensive weeks over one semester. Students are expected to undertake independent study between times. The rate of study is therefore equivalent to 50 % of full-time rate of study.

Transitional provisions