

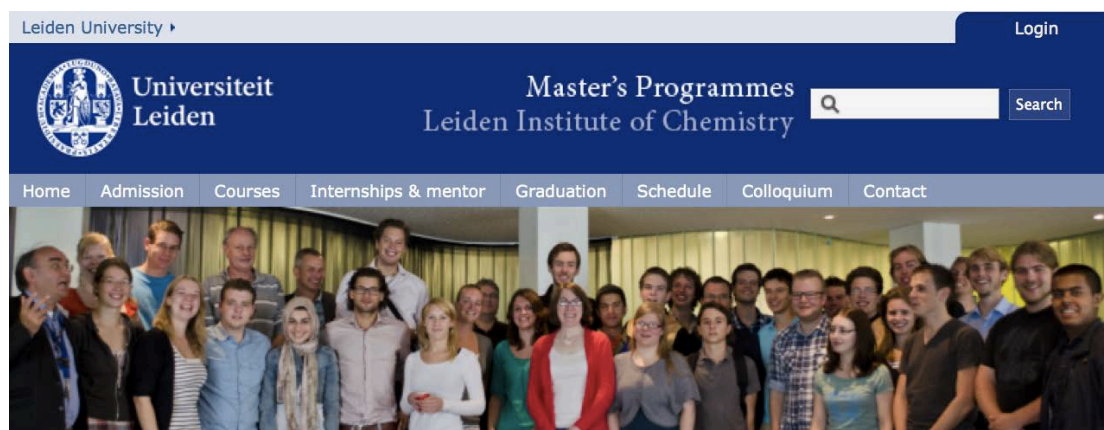
Study Guide

Master program

Life Science and Technology



Study year 2017-2018



Program, rules, schedules of the master program Life Science and Technology

- Program information <https://masters.lic.leidenuniv.nl/programmes/lst>
- Admission & enrolling in the program <https://masters.lic.leidenuniv.nl/admission-and-application>
- Schedule information <https://masters.lic.leidenuniv.nl/schedule>
- Course registration <https://masters.lic.leidenuniv.nl/registration-exams>
- Contact information <http://masters.lic.leidenuniv.nl/contact>

You can find us on Blackboard Leiden (LST-MSc-0910FWN). You can enrol yourself and next we will approve your enrolment. By enrolling you check if you have access to our ICT resources and are properly registered.

You can also create an account on our website using your student number to create your first master plan.

<https://masters.lic.leidenuniv.nl>

Version September 4, 2017

Disclaimer

The faculty staff compiled this study guide with the greatest care. However, details concerning a number of subjects may only be available after the guide has been published. For that reason, the information published in this study guide may be subject to change. Amendments, further details, and a more extensive description of the subjects can be found on the Blackboard site: blackboard.leidenuniv.nl.

Direct information can be found on our website <http://masters.lic.leidenuniv.nl>, which includes up to date agenda items and links to lecture room reservations.

Important note to students:

The University uses your U-mail account as primary e-mail address. If you do not check this mail account regularly, forward this account automatically to another e-mail address to keep receiving all official mail (including uSis mail). (<https://webmail.leidenuniv.nl/ox.html>)

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Words of welcome

Dear students,

In this study guide you will find the master program Life Science and Technology (LST) – Leiden. During the last decennia, molecular and cellular as well as chemical biology research have witnessed an unprecedented progress in our understanding of fundamental cellular processes and mechanisms underlying diseases. Both knowledge about genomic organization, studies on protein-protein interactions and determination, synthesis and application of molecular chemical structures and understanding of bio(medical) informatics are part of our modern understanding of health & disease.

Both chemical and life sciences related topics form the basis of the master study LST. The master study LST fits within the profiling research theme of the Leiden University: “BioScience: The Science Base of Health”. This implies that our master students will learn to understand the molecular and structural chemical and biological aspects of disease-related processes as well as be able to apply chemical tools in treating diseases. Apart from a research oriented specialisation there are three LST-based specialisations that train students for a career in future business, communication and education.

The MSc students will become a member/colleague of one of our research groups. The student will compose her/his MSc program together with their mentor. The mentor will guide and advise the student during the complete MSc program. The students who will choose the SBB, communication or education specialisation will, besides their specialisation modules, have a reduced research program in comparison with students in the research specialisation.

We hope that this study guide will help you to graduate successfully and above all to enjoy your master program.

On behalf of the MSc program Life Science & Technology Leiden

Prof. dr. Mathieu H. M. Noteborn
Program Director

People in the program

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Phone: internal phone numbers

International numbers dial first +31-71-527-....

* Office hours study coordinator:

Monday & Tuesday 10:00–12:00, walk in (Room EM.3.16).

Otherwise by appointment via e-mail msc-coordinator@lic.leidenuniv.nl

** Office hours Graduate School Office (“Educatief Centrum”):

Monday to Thursday 10:00–15:00, Room B114, Gorlaeus Laboratories

Otherwise by appointment via e-mail berge@edufwn.leidenuniv.nl

Entry and start of the program

Admission rules

Students with a BSc degree Life Science and Technology (LST) from Leiden/Delft will be admitted to the programme.

All other students with a BSc degree in Life Sciences, or in a field related to Life Sciences, at a different (international) University or HBO Hogeschool, can apply for admission on-line via <http://en.mastersinleiden.nl/arrange/admission>. Please notify the study coordinator if you plan to apply on-line. The Board of Admissions judges each application on the basis of the content of the BSc curriculum and on the grades obtained previously. The admission process may include an interview with the Board of Admissions. In general, only students with an outstanding track record and an outstanding research internship will be admitted.

As a guideline, HBO students should have obtained their BSc degree within four years with an average final grade of at least 7.5 and a research internship grade of at least 8.0.

All foreign students must provide a copy of an English proficiency certificate evidenced by an appropriate language test.

IELTS: minimum 6.5

TOEFL: internet based 90

Cambridge Certificate of Advanced English (CAE), minimum grade C

This requirement does not apply if you have completed your education in Canada, USA, UK, Ireland, New Zealand or Australia, or possess an International Baccalaureate.

The Education specialisation (EDU) requires proof of proficiency in Dutch. If you are admitted to our MSc program you can start in September or February. Additional student information is available on the institute website <https://masters.lic.leidenuniv.nl> and from the Foreign Admission Office of the Leiden University.

Students wishing to enrol the Life Science and Technology master program at the Leiden Institute of Chemistry should consult the webpages:

<http://www.students.leiden.edu/application-admission/master>

<https://masters.lic.leidenuniv.nl/admission-and-application>

To get the most up-to-date information or personal advice in a consult, contact the study coordinator. For all candidates the admission rules apply as stated in the Faculty “OER”. For further information consult the faculty website: <http://www.science.leidenuniv.nl>.

Talented students admitted to the master Life Science and Technology can apply for admission to one of the National Graduate Schools (see page 13).

At the start of the program

All students admitted to the program must be registered at the Leiden University and “Studielink” as an MSc student before the start of their studies. All admitted students have to make an appointment for an intake interview with the study coordinator, who will explain the use of the master planner tool and the role of the mentor. Appointments can be made by e-mail to msc-coordinator@lic.leidenuniv.nl. Students who need help with their choice of the specialisation or mentor should contact the study coordinator for advice.

Mentor system

All mentors are appointed by the board of the program and are experienced “Principal Investigators” (PI). A list of the PI’s and a brief summary of their research interests can be

found on the LIC website <http://lic.leidenuniv.nl/spotlight> (see also page 23). Each student chooses a mentor in a research field related to the selected research area; the mentor will be the student's personal coach during the complete master program. When a mentor accepts this role the student and mentor together will compose a tailor-made study program. The students will conduct their research work under supervision of their mentor. The web-based master planner is used for planning and registration of your study program, and is to be filled in in consult with your mentor. Student and mentor regularly (at least once in six months) discuss the study progress with the aid of master planner. The student will report the results of examinations and courses and may provide the mentor with a printout of the exam results using the uSis system (see page 26). It is the student's responsibility to contact the mentor for these regular discussions.

Master planner

Student can create a login on our website and add their master plan to their own profile. The student, mentor and study coordinator can view the master plan and monitor the student's progress. To create an account, go to <https://masters.lic.leidenuniv.nl/registration>. After creating your own account you can use our website to plan your studies, download forms, and arrange your research training project evaluation on-line. For questions about the master planner you can contact the study coordinator.

International Students Support

Leiden University has arranged a special portal for the support of international students: <http://www.students.leiden.edu/your-study/guidance>.

Rights and obligations of students

In the Student Charter ('Studentenstatuut' in Dutch) all rights and obligations of students, the University, Faculty and the programme are laid down. Besides being a collection of all rights and obligations, the Student Charter also lists all facilities provided by the University available to students and gives an overview of the legal protection of students. The rights and obligations laid down in the Student Charter are derived from the legislation of the Higher Education and Research Act ('Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek', WHW). Every student is supposed to have taken notice of all parts of the Student Charter.

The charter comprises two parts. The Institutional part is equal for all students and can be found on the [website of the University](#); a hard copy can be obtained from PITSstop (Information and Support Services & Information Desk Plexus Student Centre). The study programme section is intended for students on a particular study programme. This section is provided in the form of a (e)-prospectus for each study programme.

In the OER and R&R the rules of the Faculty regarding admission, examinations, the degree programme and organisation are laid down. **This information can be found on** <https://www.organisatiegids.universiteitleiden.nl/en/>.

Program structure

Life Science and Technology (LST) researches the processes in the living cell. The cell is the building block of life, the smallest unit with the characteristics of living systems. Increased knowledge of the mechanisms of the cell can lead to better medicines, new methods for combating diseases.

The master program LST is based on the Leiden University research profiling theme of “BioScience: Science Base of Health”. The study aims that students can understand the outcomes of molecular and structural chemistry and gain insight in basic targets underlying various diseases. As important, students can get knowledge in the fields of bio(medical) informatics and chemical tools for health-related applications.

LST master students with an interest in the molecular chemical (medical) basis of Life Sciences can perform training projects at the LIC, e.g. chemical biology. Students with a preclinical (bio)medical interest can attend their training projects at relevant departments of the IBL, LACDR, LUMC, NKI or ErasmusMC.

Our Master program is a two-year, full-time, English spoken, multidisciplinary program. In these two years the program aims to equip students with knowledge and expertise on molecular and biomedical fundamental level, preparing them for careers in both industrial and academic environments. Biotechnological-, food- and biopharmaceutical industries as well as healthcare and fundamental research institutions are employers of our graduates.

Specialisations

The MSc LST Leiden program consists of four specialisations:

- Life Science Research and Development (RESEARCH)
- Life Science and Education (EDU)
- Life Science and Communication and Society (SCS)
- Life Science Based Business (SBB)

More information on contents of the different specialisations is given at ‘Specialisation specific components’ (see page 11). The Life Science and Technology program has two focus areas: Molecular Science and Biomedical Science.

Composition of each study program

The distribution and size of the compulsory components of the MSc program depend on the specialisation and comprises the research training project (30-60 EC), academic writing (2 EC) and Science Methodology (4 EC) and four compulsory courses (24 EC) to be selected. Students in the EDU, SCS or SBB specialisation will follow modules specific for this specialisation (30-60 EC) and therefore have a reduced Life Science and Technology program (90-60 EC). Students in the research specialisation train their communication skills via the essay and colloquium (6 EC).

Each specialisation thus comprises five main components:

- Research training project and Thesis Talk
- Core course components of the research area
- Academic Skills
- Electives

- Specialisation specific components

Research Training project

The research specialisation comprises research training projects to a total of at least 60 EC, including a presentation for the research group and a written report (the master thesis); for the other specialisations the LST program comprises a research training project of at least 30 EC. The 60 EC for the research training projects in the research specialisation may be split over two projects: the major and minor training project.

The research training projects are carried out under the supervision of the mentor. The mentor guides the student with their research project(s) and will advise on how courses are best fit in their study planning. The major research training projects can be carried out in the LIC home institute, our affiliated institutes IBL, LACDR, LUMC, NKI, ErasmusMC or abroad. Before the start of any training project the mentor has to initiate an on-line research training project agreement that is completed by the student. The student and mentor must complete and agree on this agreement before the start of the training project. The student can carry out a single research training project or carry out a major and a minor research training project.

The research training project includes a presentation, a written report and a thesis talk (for major master thesis only).

The optional 'minor' training project comprises of at least 20 EC covering another research topic, which can be related to the major research training project. The minor and major research training projects must be carried out in different research groups and be supervised and evaluated by different staff members, but may be related which may be reflected in a combined master thesis. As an example the student may develop an expression system in one research group and investigate its properties in another research group. Or the student may investigate a process in one research group and calculate theoretical predictions in another research group. Students are encouraged to carry out a 'minor' training project/project abroad. The duration of the project is preferably three to four months based on full-time attendance. All external research projects (=outside the LIC or affiliated institutes) must be discussed in advance with the study coordinator. Before the start of the training project the Board of Examiners must approve the external research project.

The total duration of the research project(s) is based on full-time attendance. Generally a month of full-time work (40 h per week) equals 6 EC. This means that courses attended during the research period will lead to an extension of the duration of the training project. Also, insufficient attendance or lack of diligence can lead to an extension of the duration of the internship. In special cases the project may be provisionally awarded with part of the assigned credits (without a grade), notably for foreign students who need to provide proof of their study progress to the IND.

Before the start of any training project the student and mentor/supervisor have to complete a research training project agreement. This digital form is created online by the mentor at the LIC master site (<https://masters.lic.leidenuniv.nl>).

After completion of the practical work, the student and supervisor make an agreement on the deadline for handing in the final version of the MSc thesis or project report. The final version of the report should be handed in within 3 months after the last day of practical work. For all Research Projects, it is not possible to obtain a grade higher than 6 if this deadline is exceeded.

The mentor initiates the grading by creating a digital research evaluation form on the educational website <https://masters.lic.leidenuniv.nl> at the end of any training project. Before a final grade can be given the student should submit the final master thesis to the study coordinator for the jury of the Thesis Talk (see below). The signed form and a pdf file of the final version of the master thesis are submitted after grading to the group administration and uploaded at the LIC master site.

Thesis Talks

All master students prepare a master thesis during their studies and present their research results in a Thesis Talk that is organized preferably on Thursday afternoon or alternatively on Wednesday afternoon. The current agenda can be found in the list of upcoming events on the website <https://masters.lic.leidenuniv.nl>. All students have to attend 10 Thesis Talks. The Thesis Talks can be registered on the colloquium/Thesis Talk attendance list (see also page 11). You must attend a number of Thesis Talks before you give your own presentation. The student has to hand in a copy of the Thesis Talk attendance list at the Educational Centre (Ms. Chantal van den Berge) upon arranging of the graduation.

Practical considerations concerning the Thesis Talk

- A Thesis Talk is booked at least two weeks before the desired date of presentation via e-mail to the study coordinator, the mail contains:
 - the final digital version of the MSc thesis
 - the approval of the supervisor/mentor (cc to the mentor/supervisor)
 - the names of the two evaluators of the MSc thesis
 - a proposed date (Wednesday or Thursday) agreed upon with the evaluators.This information will be used to assemble a jury for your Thesis Talk and to announce your Thesis Talk on the MSc website.
- The study coordinator establishes the jury and will send them a digital copy of the report for evaluation at least one week before the intended date of the Thesis Talk. The jury is formed of experienced researchers who are selected based on their affinity with the topic and their independence from the investigation. The study coordinator establishes the jury and will send them a digital copy of the report for evaluation at least one week before the intended date of the Thesis Talk.
- We strongly advise all students to give a rehearsal talk. Note that your Thesis Talk may be very suitable for a job interview.
- Generally you can use the computer and blackboard in the lecture room. If you want to use your own laptop, and laser pointer, please make sure that they are in good shape!
- The mentor must provide a printed version of the evaluation form for the jury.
- Immediately after the talk(s) the jury discusses their findings of the report and presentation with the supervisor(s) and/or mentor(s). The jury and mentor/supervisor will agree on the final grade.
- The jury sends a small written report to the study coordinator and their findings are discussed in the Board of Examiners.

Core courses

The size of the compulsory components of the MSc program depends on the specialisation and comprises the research project (30-60 EC) and four compulsory components (24 EC) (detailed below).

Students in the EDU, SCS or SBB specialisation need to follow modules specific for a specialisation (30-60 EC) and therefore have a reduced Life Science and Technology program (90-60 EC). The compulsory LST modules in these specialisations comprise a research training project (at least 30 EC) and four core courses (24 EC). Students in the research specialisation train their communication skills via the essay and colloquium (6 EC). All LST MSc students have to attend the course Academic Skills consisting of Academic Writing and Science Methodology.

Electives

The electives comprise a free choice of theoretical courses or an extension of the research training project(s) by a maximum of 20 EC, provided that the total duration of the major research training project does not exceed 60 EC. The mentor may limit the choice in elective courses by the need to adapt the program to the present knowledge of the student. Students can choose their electives from the list of core courses or electives, the core or elective courses the MSc program Life Science Science and Technology or MSc program Chemistry or from other MSc programs in the Science Faculty of level 400 or higher, or level 400 courses from the BSc LST and MST programs provided that these were not part of the student's earlier studies. Students may also choose MSc courses of any Science Faculty in the Netherlands as elective courses.

Note: other electives have to be approved by the Board of Examiners when they will be included in the master curriculum

Specialisation specific components

Life Science research and development

The research specialisation offers the student the opportunity to spend two full years on training in a research area to become an independent and creative scientist. The majority of the students with an MSc in Life Science research will continue their career in a PhD position. Students in this specialisation have to prepare an essay and present the essay in a public colloquium (6 EC).

Literature essay and colloquium guidelines

In the research specialisation the student selects a topic for the colloquium & (literature) essay topic in consultation with a colloquium supervisor. The colloquium supervisor is a member of the LIC staff but cannot be the student's mentor. The subject of the essay & colloquium is chosen within the field of Life Sciences or Chemistry but may not be directly related to the student's research training project.

The colloquium & essay comprises two parts:

- A written essay of 10-15 pages (3000-4000 words).
- A colloquium of 20 minutes, including 5-10 minutes of discussion.

The colloquium & essay should contain at least the following basic elements:

- Introduction and scope
- Review of the topic
- Conclusion and outlook

A committee of two staff members (NOT the mentor NOR the colloquium supervisor) grades the colloquium & essay. The student in consult with the colloquium supervisor composes the jury and invites the jury members to read the essay and to be present at the colloquium.

Every MSc student is required to attend at least 10 colloquia of fellow MSc students of the various research themes during their MSc period. As proof of attendance, the chairman of the colloquium signs the student's colloquium attendance list. The student sends a digital copy of the colloquium attendance list to the study coordinator before the exit interview.

The jury members should receive the essay at least one week before the colloquium!

The colloquia are preferably held on Wednesdays or alternatively on Thursdays at 15:30 or 16:00. To schedule the colloquium, **at least one week before the colloquium** the student sends an e-mail to the [study coordinator](#), including the pdf of the essay and stating the preferred date. Additionally, this e-mail should contain the names of the mentor, the supervisor of the colloquium and the jury members. The study coordinator will make sure that the colloquium fits in the schedule, and will propose a definitive date and time. The study coordinator will make a reservation for a lecture room and will announce the colloquium on the MSc website. The student will download the colloquium grading form and fill in the required fields as far as possible, to hand it over to the jury at the colloquium. Every MSc student is required to attend at least 10 colloquia of fellow MSc students of the various research themes during their MSc period. As proof of attendance, the chairman of the colloquium signs the student's colloquium attendance list. The student has to hand in a copy of the colloquium attendance list at the Educational Centre (Ms. Chantal van den Berge) upon arranging of the graduation.

The colloquium procedure, the colloquium attendance list and grading form can be found at the MSc web site: <https://masters.lic.leidenuniv.nl/colloquium>.

Life Science Based Business (SBB)

The specialisation Life Science Based Business (SBB) offers the opportunity to combine training in chemical research with education in business and entrepreneurship. It enables science students to understand the fundamentals of business management and innovation. The emphasis is on science-driven organisations and on establishing new business based on the outcomes of scientific research. The SBB program is geared towards pursuing future career opportunities, both in academia and in industry. The majority of the SBB-students have found employment in industry as consultant or in a managerial position.

Completing the SBB specialisation requires 40-60 EC of business courses, this can be done in two options.

- **Management Fundamentals**, including at least Business Research Methods, Strategy, Marketing (SBB), Financial Management, Technology & Operations Management and the SBB Business Studies Internship.
- **New Technology Ventures track**, including at least the New Technology Ventures (NTV) courses: NTV1: Entrepreneurial Opportunities, NTV2: The Entrepreneurial Process, NTV3: Business Planning and New Technology Ventures Assignment .

These SBB modules consist of courses (15 EC) and the SBB training project or RBB assignment (25 EC). The total amount of SBB program components is limited to 60 EC.

More information and registration instructions for Science-Based Business are available on the website www.sbb.leidenuniv.nl. **The SBB program starts twice a year in September and February.** Note that at the time of publication of this study guide the September course may be fully booked, advance registration is mandatory.

Life Science and Education (EDU)

The education part of the MSc program Life Science and Education is organised by the Leiden University Graduate School of Teaching (ICLON) and the program language is Dutch. The specific modules comprise courses in Adolescent Psychology (5 EC); Learning and Instruction 1&2 (8 EC); Subject Methodology 1&2 (10 EC); Design Research (7 EC); School Practice 1&2 (30 EC). The program is designed to obtain the so-called “eerstegraads lesbevoegdheid” which qualifies for teaching Chemistry at all levels in Dutch high schools. Students that already have chosen the minor Education in their BSc program need only 30 EC of the specific modules; the remaining 30 EC is then added to the Electives of the Chemistry program. LST students can also obtain an “eerstegraadsbevoegdheid” in Biology. They have to the above mentioned Chemistry program to study several biology-specific items. These programs are in Dutch.

More information can be found on the website <https://www.universiteitleiden.nl/en/iclon>. **The education program can only be started in September after completion of the LST modules of the program.** Enrolment starts in April as a training position in a high school must be acquired.

Life Science and Communication and Society (SCS)

The MSc track in Communication offers students the opportunity to combine research training with programs in different aspects of science communication, such as journalism, new media, museology and information visualisation. The MSc specialisation Life Science and Communication and Society is offered by lecturers in Science Communication & Society (SCS). The SCS module comprise courses in SCS Fundamentals (19 EC), Scientific Narration and Visualization (4 EC), SCS research proposal (3 EC), and SCS internship(s) (14-34 EC). The primary focus in this specialisation is on science communication in the Netherlands and students explore various aspects of professional science communication.

More information can be found on the SCS website <https://www.universiteitleiden.nl/en/science/science-communication-and-society>. **The communication program starts in September.**

National Graduate Schools

In the Leiden Institute of Chemistry state-of-the-art chemical research is done. The institute co-organizes two bachelor programs, Molecular Science and Technology and Life Science and Technology that cover Chemistry in the broadest sense and prepare for a career in Chemistry, Chemical Engineering or Life Science and Technology. The two master programs Chemistry and Life Science and Technology are centred on the core research of the institute

carried out in the various research groups. These master programs are organised in the Graduate School of the Faculty of Mathematics and Natural Sciences.

The LIC also houses two National Graduate Schools with eight other universities. These National Graduate Schools are designed for talented students aiming for a future PhD position. Talented LST students can apply for admission in two of these Graduate Schools (NRSCB and NMARRS).

- **Sustainability: the Molecular Approach, HRSMC** (collaboration of research groups in the Leiden University with the VU University Amsterdam and University of Amsterdam, <http://www.hrsmc.nl/graduate-programme>).
- **Solar Fuel Catalysis, NIOK** (collaboration of research groups at Utrecht University, the Eindhoven University of Technology, Leiden University and the University of Twente, <http://www.niok.eu/en/solarfuels>).

Global overview of the program

You will organize your program according to the global scheme shown below in accordance with your mentor. Your program must comply with the “[OER](#)”, the program regulations.

Global overview of the Life Science & Technology program by specialisation				
	Research	EDU	SCS	SBB
Research training project	60	30	30	30
Core components	24	24	24	24
Academic Skills	6	6	6	6
Electives**	24	0/30*	20	20
Specialisation-specific components	6	60/30*	40	40
Total	120	120	120	120

* Students who have finished a minor Education of 30 EC in their BSc study (“tweedegraads lesbevoegdheid”), need only 30 EC in their MSc study to obtain the “eerstegraads lesbevoegdheid”. The elective components for these students comprise 30 EC.

** The electives are chosen in consultation with the mentor. A maximum of 20 EC can be used for extension of the research training project(s).

Lists of core courses and electives

Core courses in the Life Science and Technology program

The LST master students have to choose 2 courses from the Molecular Science series and 2 from the Bio(medical) Science series. Description of the Life Science core courses in the LST program:

All courses: level 500 & 6 EC	Lecturer	Code
Molecular Science series		
Molecular Chemistry	van der Marel	MC
Enzyme Dynamics: NMR spectroscopy and kinetics	Ubbink	EDNMR
Bionanotechnology	Schneider/ Blokhuis	BNT
Chemical Genetics	Brouwer et al.	CG
Bio(medical) Science series		
Genome organization and maintenance in cancer and aging	Brouwer	GCA
Bio(medical) Informatics	Wolstencroft	BMI
Global Regulatory Networks in Bacteria	van Wezel et al.	GRNB
In-vivo biomolecular interactions underlying diseases	Aerts/Noteborn	IBID

- **Molecular Chemistry**

Fundamental concepts of organic chemistry, the most common transformations and corresponding reaction mechanisms are discussed and illustrated with examples of reactions that are part of biological processes.

- **Enzyme Dynamics: NMR spectroscopy and kinetics**

Proteins carry out most functions in the cell. These molecules are not rigid, but are mobile on a wide range of timescales. The course aims to convey the concept of protein dynamics in relation to biological function. The focus is on enzyme catalysis and two techniques will be discussed in detail: nuclear magnetic resonance (NMR) spectroscopy to study protein mobility and kinetic measurements to determine enzyme activity. NMR is a versatile analytical technique with many applications. We will discuss the fundamentals of NMR (chemical shift, dipolar coupling, J-coupling, relaxation), as well as two-dimensional NMR and relaxation experiments to characterize molecular mobility on nanosecond and millisecond timescale. It provides a basis in NMR spectroscopy that is of use for any chemist. The study of kinetics will comprise steady state and pre-steady state theory and methods to measure enzyme characteristics such as k_{cat} and K_M , as well as inhibitor kinetics.

- **Bionanotechnology**

Bionanotechnology studies the implementation of nanomaterials to understand biology. Bionanotechnology represents a large research field with an important part lead by large and medium sized companies. Although the word 'bionanotechnology' does not contain the word 'chemistry', chemistry – however – is one of the driving forces in this field. Bionanotechnology finds many applications in chemical biology research, DNA/protein sequencing, drug delivery systems, sustainable energy, and biosensors.

- **Chemical Genetics**

Chemical genetics is a research method that uses small molecules to change the way proteins work directly in real time rather than indirectly by manipulating their genes. It is used to identify which proteins regulate different biological processes, to understand in molecular detail how proteins perform their biological functions, and to identify small molecules that may be of medical value. In this course several examples of chemical genetics will be introduced.

- **Bio(medical) Informatics**

Main topics: Computational analysis of genomic data (genome assemblies, genome-scale alignments, genomic context analysis, SNP data analysis). Evolution and diversity of human genome. Medical Genomics (biomarker identification, epigenetics, disease-associated genes, human pathogen data, gut metagenomics). Computational analysis of biopolymers (structure predictions, biomolecular engineering, functional annotation of proteins, protein design). Cheminformatics, data mining of biologically active compounds, searching for drugs and drug targets.

- **Genome organization and maintenance in cancer and aging**

To understand the organization, regulation and functioning of our genome, in normal, cancer and aging situations the students will be lectured in the following topics: chromatin structure, histone modifications, gene regulation, recombination, silencing of genes on DNA

and RNA level and chromatin remodelling. Bioinformatics aspects are also part of this course.

- **Global regulatory networks in bacteria**

Series of lectures and workshops will be given on understanding how global regulatory networks govern gene expression in bacteria, with comparison to (lower) eukaryotes. We will look at how environmental signals (e.g. nutrients, stress) are translated to switch sets of genes on and off, and how this affects metabolism, competence, development and antibiotic production. Focus is on *E. coli*, *Bacillus* and *Streptomyces*. This course includes workshops on use of the databases and regulon prediction programs.

- **In-vivo bio-molecular interactions underlying diseases**

Studies of In-vivo bio-molecular interaction are essential for our understanding of cellular functioning. Specific in-vivo interactions controlling e.g. metabolics, cell cycle, differentiation, proliferation or apoptosis events will be discussed in normal healthy and in disease-related situations. This MSc-course will also discuss the fundamental, applied and technical aspects of proteomics and transcriptomics. A main focus will be on the ongoing LIC research on lysosomal storage diseases such as Gaucher's Disease. In addition, academic skills of writing and reading scientific articles are included.

Compulsory for all students

Academic Writing (2 EC)	N.N.	AWR
Scientific Methodology (4 EC)	Gijsbers, Ubbink	SCM

Elective courses of the Life Science and Technology program

Title	Lecturer	EC	Code
Advanced Medicinal Chemistry	Van der Stelt	6	4423ADMC6
Biomaterials	Kieltyka, Noteborn, Kros	6	4423BIOMA
Bio-modeling and Petri Nets	Bertens/Verbeek	6	4343BIOPN
Bioanalytical Mass Spectrometry	Hankemeier	6	4323CAAMSY
Chemical Immunology	Van Kasteren	6	4423CHEIM
Cross-domain chromatin organisation	Dame	4	4423CDCO4
Genomic Scale Data Analysis*	Reinders	4	LB2591
Industrial Biotechnology*	Van Maris	5	LB2581
Mathematical Biology, Metabolic Network Analysis	Hille	6	4373MABIM
Metals in Life	Bonnet	6	4333METL6
Modern Organic Chemistry	van der Marel	6	4333MODOC
Molecular Aspects of RNA Viruses	Olsthoorn	4	4333MAORV
Molecular Biophysics*	Dame	3	LB2282
Molecular Cell Signaling*	Noteborn	4	LB2211
Molecular Defects in Human Diseases*	Brouwer	5	LB2201
Molecular Mechanisms of Cell Death	Daanen	4	4323LSMCD

* Bachelor courses (level 400) that may be included in a master program provided that this course is not part of a prior bachelor program.

Other eligible courses in the MSc Life Science and Technology program

Electives are often announced on the master program web pages, Blackboard or in the University newspaper 'Mare' under 'Mededelingen FWN' (announcements of the Faculty of Science).

In addition to the courses described above students may also choose MSc courses from the MSc Chemistry, the BSc LST and BSc MST. Details about these courses can be found on the website <https://masters.lic.leidenuniv.nl/courses> where we also recommend other courses in Leiden and Delft.

Students may also choose courses from MSc programs in all Dutch Science Faculties. It may be necessary to enrol as an external student at the university organising the chosen course. For more information, contact the study coordinator.

An overview of all Dutch master programs in Chemistry and Chemical Engineering is presented on: www.universitairemasters.nl.

Optional courses may also be taken from the educational program of one of the national research schools (HRSMC, or NMARRS, see page 13). These Graduate Schools offer a number of inter-university courses and schools on various subjects.

Schedule and Timetable

The schedule is maintained on-line on our web site and consists of two parts: the timetable and the location of the lectures. The lectures are booked in the "ZRS" system.

The most actual schedule can be found here: <https://masters.lic.leidenuniv.nl/schedule>.

The locations can be found at: <http://zrs.leidenuniv.nl/ul/start.php>

Lecture hours

1st & 2nd Class 9:00 – 11:00

3rd & 4th Class 11:00 – 13:00

5th & 6th Class 13:30 – 15:30

7th & 8th Class 15:30 – 17:30

Exam hours

Morning exam: 9:00 – 12:00

Afternoon exam: 14:00 – 17:00

The most up to date schedule for the rooms will be available on the website of the program and on the large screen at the main entrance of the Gorlaeus Laboratories.

Course schedule – period 1

MSc Chemistry and MSc Life Science & Technology - Schedule 2017-2018 (version July 19, 2017)

1st period

week	#	Monday					Tuesday					Wednesday					Thursday					Friday				
		Mon 1/2	3/4	5/6	7/8		Tue 1/2	3/4	5/6	7/8		Wed 1/2	3/4	5/6	7/8		Thu 1/2	3/4	5/6	7/8		Fri 1/2	3/4	5/6	7/8	
36	1.1	BMI/ HET	MC				SPEC		INTRO				MC	MAL	Coll	CPS		SPEC	TT			CPS	MAL		BMI/ HET	
37	1.2	BMI/ HET	MC	SUP	MAL		SPEC		SUP			MC	MAL	Coll			Safety, Integrity, Library use						CPS	MAL		BMI/ HET
38	1.3	BMI/ HET	MC	SUP			SPEC	SC start	SUP		CEB	MC	MAL	Coll		CPS	CEB	SPEC	TT			CPS	MAL		BMI/ HET	
39	1.4	BMI/ HET	MC	SUP	MAL		SPEC		SUP		CEB	MC		Coll		CPS	CEB	SPEC	TT			CPS	MAL		BMI/ HET	
40	1.5	BMI/ HET	MC	SUP			Leidens Ontzet					CEB	MC	MAL	Coll	CPS	CEB	SPEC	TT			CPS	MAL			
41	1.6	BMI/ HET	MC	SUP	MAL		SPEC		SUP		CEB	MC	MAL	Coll		CPS	CEB	SPEC	TT			CPS	MAL		BMI/ HET	
42	1.7	BMI/ HET	MC	SUP			SPEC		SUP		CEB	MC		Coll		CPS	CEB	SPEC	TT			CPS	MAL		BMI/ HET	
43	1.8	BMI/ HET	MC	SUP			SPEC		SUP		CEB	MC		Coll		CPS	CEB	SPEC	TT			CPS	MAL		BMI/ HET	
44	1.9			Exam SC					Exam BMI					Exam CPS					Exam SPEC						Exam CEB	
45	1.10			Exam SUP					Exam MAL					Exam MC					Exam FMNR			Exam HET				

CEB, Notebook; SUP, Kros; MAL, Bonnet; SPEC, Heterscheid; HET, Groot; CPS, Fu, SC, Somers; BMI, Woistencroft; MC, Van der Marei; VEI, Noteborn; TT thesis talk and Coll colloquium see: <https://masters.lic.leidenuniv.nl>

Lecture hours: 1/2: 9.00-10.45, 3/4: 11.00-12.45, 5/6: 13.30-15.15, 7/8: 15.30-17.15 Practicals: 9.00-17.00 Exams: 9.00-12.00 or 14.00-17.00; In USC: 13.00-16.00

Course schedule – period 2

MSc Chemistry and MSc Life Science & Technology - Schedule 2017-2018 (version July 19, 2017)

2nd period

week	#	Monday			Tuesday			Wednesday			Thursday			Friday											
		Mon 1/2	3/4	5/6	7/8	Tue 1/2	3/4	5/6	7/8	Wed 1/2	3/4	5/6	7/8	Thu 1/2	3/4	5/6	7/8								
46	2.1	CHI	MB/DIP	ROC		MQC	GCA	CG			MB/DIP	Coll	ROC	ROC	MQC	TT	CHI	GCA	CG						
47	2.2	CHI	MB/DIP	ROC	PC	MQC	GCA	CG	AWR		MB/DIP	Coll	ROC	ROC	MQC	MM	CHI			CG	PC				PC
48	2.3	CHI	MB/DIP	ROC	PC	MQC	GCA	CG			MB/DIP	Coll	ROC	ROC	MQC	TT	CHI	GCA	CG	CG	PC				PC
49	2.4	CHI	MB/DIP	ROC	PC	MQC	GCA	CG	AWR		MB/DIP	Coll	ROC	ROC	MQC	TT	CHI	GCA	CG	CG	PC				
50	2.5	CHI	MB/DIP	ROC	PC	MQC	GCA	CG			MB/DIP	Coll	ROC	ROC	MQC	TT	CHI	GCA	CG	CG	PC				
51	2.6	CHI	MB/DIP	ROC	PC	MQC	GCA	CG			MB/DIP	Coll	ROC	ROC	MQC	TT	CHI	GCA	CG	CG	PC				
52	V																								
1	V																								
2	2.7	CHI	MB/DIP	ROC	PC	MQC	GCA	CG	AWR		MB/DIP	Coll	ROC	ROC	MQC	TT	CHI	GCA	CG	CG	PC				
3	2.8	CHI	MB/DIP	ROC	PC	MQC	GCA	CG			MB/DIP	Coll	ROC	ROC	MQC	TT	CHI	GCA	CG	CG	PC				
4	2.9																								Exam GCA
5	2.10																								Exam PC

MB, Boot; ROC, Codes; AWR, X; CHI, Van Kasteren; MQC, Buda; PC, Bonnet; DIP, Meyer; GCA, Brouwer; CG, Brouwer et al; MfM Meet the Mentor, TT thesis talk and Coll colloquium see: <https://masters.lic.leidenuniv.nl>

Lecture hours: 1/2: 9.00-10.45, 3/4: 11.00-12.45, 5/6: 13.30-15.15, 7/8: 15.30-17.15 Practicals: 9.00-17.00 Exams: 9.00-12.00 or 14.00-17.00; In USC: 13.00-16.00

Course schedule – period 3

MSc Chemistry and MSc Life Science & Technology - Schedule 2017-2018 (version July 19, 2017)

3rd period

week	#	Monday					Tuesday					Wednesday					Thursday					Friday						
		Mon 1/2	3/4	5/6	7/8		Tue 1/2	3/4	5/6	7/8		Wed 1/2	3/4	5/6	7/8		Thu 1/2	3/4	5/6	7/8		Fri 1/2	3/4	5/6	7/8			
6	3.0	05-Feb	ICB					ICB					ICB					ICB										
7	3.1	12-Feb	MHC	GRNB	EDNMR	SCM	EBE	CDC		EDNMR/ DST		MOC		VEI		MHC	EBE				TT	MOC	CDC					
8	3.2	19-Feb	MHC	GRNB	EDNMR	SCM	EBE	CDC		EDNMR/ DST		MOC			Coll	MHC	EBE		AWR		TT	MOC	CDC					
9	3.3	26-Feb	MHC	GRNB	EDNMR	SCM	EBE	CDC		EDNMR/ DST		MOC			Coll	MHC	EBE				TT	MOC	CDC					
10	3.4	05-Mar	MHC	GRNB	EDNMR	SCM	EBE	CDC		EDNMR/ DST		MOC			Coll	MHC	EBE					MOC	CDC					
11	3.5	12-Mar	MHC	GRNB	EDNMR	SCM	EBE	CDC		EDNMR/ DST		MOC			Coll	MHC	EBE		AWR		TT	MOC	CDC			Master day		
12	3.6	19-Mar	MHC	GRNB	EDNMR	SCM	EBE	CDC		EDNMR/ DST		MOC			Coll	MHC	EBE				TT	MOC	CDC					
13	3.7	26-Mar	MHC	GRNB	EDNMR	SCM	EBE	CDC		EDNMR/ DST		MOC			Coll	MHC	EBE		AWR		MMM							
14	3.8	02-Apr	Easter Monday																									
15	3.9	09-Apr								Exam EBE/CDC											Exam EDNMR							
16	3.10	16-Apr																			Exam GRNB						Exam MHC	
			ICB					ICB					ICB					ICB										
MOC, Van der Marei; EDNMR, Ubbink, Pannu; SCM, Gijbers, AWR, X; ICB, Van Eijk; EBE, Koper; MHC, Bouwman; DST, Kroes; GRNB, van Weazel et al.; CDC, Dame; Mtm Meet the Mentor, TT thesis talk and Coll colloquium see: https://masters.lic.leidenuniv.nl																												
Lecture hours: 1/2: 9.00-10.45, 3/4: 11.00-12.45, 5/6: 13.30-15.15, 7/8: 15.30-17.15 Practicals: 9.00-17.00 Exams: 9.00-12.00 or 14.00-17.00; In USC: 13.00-16.00																												

Course schedule – period 4

Msc Chemistry and MSc Life Science & Technology - Schedule 2017-2018 (version July 19, 2017)

		4th period																					
		Monday				Tuesday				Wednesday				Thursday				Friday					
week	#	Mon 1/2	3/4	5/6	7/8	Tue 1/2	3/4	5/6	7/8	Wed 1/2	3/4	5/6	7/8	Thu 1/2	3/4	5/6	7/8	Fri 1/2	3/4	5/6	7/8		
17	4.1	BIOC/ MRV	MOL	BNT	PBE	IBID	AMC	BMAT/ DST		CB	BNT	PBE	Coll	CB	BIOC/ MRV	MOL						7/8	
18	4.2	BIOC/ MRV	MOL	BNT	PBE	IBID	AMC	BMAT/ DST		CB	BNT	PBE	Coll	IBID	AMC	BMAT	TT	CB	BIOC/ MRV	MOL			
19	4.3	BIOC/ MRV	MOL	BNT	PBE	IBID	AMC	BMAT/ DST		CB	BNT	PBE	Coll										
20	4.4	BIOC/ MRV	MOL	BNT	PBE	IBID	AMC	BMAT/ DST		CB	BNT	PBE	Coll										
21	4.5					IBID	AMC	BMAT/ DST		CB	BNT	PBE	Coll	IBID	AMC	BMAT	TT	CB	BIOC/ MRV	MOL			
22	4.6	BIOC/ MRV	MOL	BNT	PBE	IBID	AMC	BMAT/ DST		CB	BNT	PBE	Coll	IBID	AMC	BMAT	TT	CB	BIOC/ MRV	MOL			
23	4.7	BIOC/ MRV	MOL	BNT	PBE	IBID	AMC	BMAT/ DST		CB	BNT	PBE	Coll	IBID	AMC	BMAT	TT	CB	BIOC/ MRV	MOL			
24	4.8	BIOC/ MRV	MOL	BNT	PBE	IBID	AMC	BMAT/ DST		CB	BNT	PBE	Coll	IBID	AMC	BMAT	TT	CB	BIOC/ MRV	MOL			
25	4.9	BIOC/ MRV	MOL	BNT	PBE	IBID	AMC	BMAT/ DST		CB	BNT	PBE	Coll	IBID	AMC	BMAT	TT	CB	BIOC/ MRV	MOL			
26	4.10				Exam MRV				Exam BNT			Exam PBE					Exam BMAT					Exam CB	
27	4.11				Exam MOL				Exam DST			Exam AMC										Exam BIOC	

AMC, Van der Stelt; CB, Overkleeft; BMAT, Kietjyika; PBE, Pandit; DST, Kroes; BIOC, Hetterscheid; BNT, Schneider; IBID; Noteborn; MOL, Van der Marei, MRV, Olisthoorn; TT thesis talk and Coll colloquium see: <https://masters.lic.leidenuniv.nl>

Lecture hours: 1/2: 9.00-10.45, 3/4: 11.00-12.45, 5/6: 13.30-15.15, 7/8: 15.30-17.15 Practicals: 9.00-17.00 Exams: 9.00-12.00 or 14.00-17.00; In USC: 13.00-16.00

Lecturers and mentors

Links to important contacts

Description of the research topics and mentors can be found on the educational and the institute website (<http://lic.leidenuniv.nl>). The contact details of the groups can be found there or via a name search on <https://www.universiteitleiden.nl>

List of LIC lecturers and mentors (■)

		Phone	e-mail
■	Prof. dr. J.M.F.G. Aerts	4940	j.m.f.g.aerts@lic.leidenuniv.nl
	Dr. R.J.B.H.N. van den Berg	4768	r.j.vdberg@chem.leidenuniv.nl
	Dr. E.M. Blokhuis	4542	e.blokhuis@chem.leidenuniv.nl
■	Dr. S. Bonnet	4260	bonnet@chem.leidenuniv.nl
	Dr. R.G. Boot	4771	r.g.boot@lic.leidenuniv.nl
■	Prof. dr. E. Bouwman	4550	bouwman@chem.leidenuniv.nl
	Dr. F. Buda	5723	f.buda@chem.leidenuniv.nl
	Prof. dr. J. Brouwer	4755	brouwer@chem.leidenuniv.nl
■	Dr. J. Codée	4280	jcodee@chem.leidenuniv.nl
■	Dr. R.T. Dame	5605	rtdame@chem.leidenuniv.nl
	Dr. M.C. van Eijk	4771	m.c.van.eijk@lic.leidenuniv.nl
	Dr. D.V. Filippov	4768	filippov@chem.leidenuniv.nl
	Dr B.I. Florea	4362	b.florea@chem.leidenuniv.nl
	Prof. dr. C. Fonseca Guerra	5569	c.fonseca.guerra@lic.leidenuniv.nl
	Prof. dr. J.G.E.M. Fraaije	4243	j.fraaije@chem.leidenuniv.nl
	Dr. W.T. Fu	4215	w.fu@chem.leidenuniv.nl
	Dr. N. Goosen	4773	n.goosen@chem.leidenuniv.nl
■	Dr. I.M.N. Groot	4215	i.m.n.groot@lic.leidenuniv.nl
■	Prof. dr. H.J.M. de Groot	4539	h.groot@chem.leidenuniv.nl
■	Dr. D.G.H. Hetterscheid	4545	d.g.h.hetterscheid@chem.leidenuniv.nl
■	Dr. L.B.F. Juurlink	4221	l.juurlink@chem.leidenuniv.nl

■	Dr. S.I. van Kasteren	4276	s.i.van.kasteren@chem.leidenuniv.nl
■	Dr. R.E. Kieltyka	4441	r.e.kieltyka@chem.leidenuniv.nl
■	Prof. dr. M.T.M. Koper	4250	m.koper@chem.leidenuniv.nl
■	Prof. dr. G.J. Kroes	4396	g.j.kroes@chem.leidenuniv.nl
■	Prof. dr. A. Kros	4234	a.kros@chem.leidenuniv.nl
■	Prof. dr. G.A. van der Marel	4280	marel_g@chem.leidenuniv.nl
■	Dr. J. Meyer	4533	j.meyer@chem.leidenuniv.nl
	Prof. dr. M.H.M. Noteborn	4544	m.noteborn@chem.leidenuniv.nl
	Dr. R.R.C.L. Olsthoorn	4586	olsthoor@chem.leidenuniv.nl
	Dr. Ing. M. Overhand	4483	overhand@chem.leidenuniv.nl
■	Prof. dr. H.S. Overkleef	4342	h.s.overkleef@chem.leidenuniv.nl
■	Dr. A. Pandit	4198	a.pandit@chem.leidenuniv.nl
■	Dr. N.S. Pannu	4414	raj@chem.leidenuniv.nl
■	Dr. G.F. Schneider	4770	g.f.schneider@chem.leidenuniv.nl
	Dr. M.F. Somers	4437	m.somers@chem.leidenuniv.nl
	Dr. M.H. de Smit	5897	m.smit@chem.leidenuniv.nl
■	Dr. M. v.d. Stelt	4768	m.van.der.stelt@chem.leidenuniv.nl
■	Prof. dr. M. Ubbink	4628	m.ubbink@chem.leidenuniv.nl

Important Committees and Boards in the organisation

Board of Admission

The Board of Admission is an independent body judging the qualifications of students who want to start a master program and decides on the admission. The chair of the Board of Admission seeks advice with the senior staff when needed.

Educational Committee

The master program is monitored by an Educational Committee formed by elected student representatives from the MSc Chemistry, MSc Life Sciences and Technology and a MSc student from the Science Faculty representing the Science Based Business specialization. The study associations Chemisch Dispuut Leiden and S.V. LIFE each have a student representative in the Educational Committee. The Educational Committee is a joint committee of the two master programs organized by the LIC, LST and Chemistry. It also acts as an advisory board for the master specialisation Science Based Business organized by the Faculty of Science.

In the Educational Committee all educational matters that concern students and staff can be discussed. The program directors and the chairs of the Board of Examiners are invited for each meeting of the Committee. The study coordinator is present at the meetings and is secretary of this Committee.

Board of Examiners

The Board of Examiners is the most important board in the program as they are entitled to approve your graduation, assign the right to grade courses and the right to supervise training projects to the lecturers. Moreover, the official task of the Board of Examiners is to guard the educational level of the academic program including a check on the originality and scientific quality of the submitted MSc theses.

The Board of Examiners have to approve of changes in student's individual program based on the OER and may permit students to execute part of their program at other institutes. The Board of Examiners composes the Rules and Regulations, a document that contains additional details on examination procedures in the program. The Board of Examiners validates the graded research training project and needs access to the following documents for each training project:

- The research training project agreement (digitally stored)
- The signed and completed training project evaluation form (digitally stored)
- A pdf version of the graded version of the final thesis (digitally stored)
- A report of the jury of the Thesis Talk (digitally stored).

Students may contact the Board of Examiners by e-mail to excie_msc_chem_lst@LIC.leidenuniv.nl.

Examinations and re-examinations

General rules

Students must sign-up for all exams using the uSis system. On the website of the Graduate School all course IDs and class numbers can be found. If a student fails to pass an exam they are given the opportunity to participate in a re-examination. As the re-examinations are not scheduled, the following procedure is used to set the date of the re-examination:

1. Students who want to take part in a re-examination should contact the teacher as soon as the results are available.
2. The teacher composes a list of students who want to take part in the re-examination, determines a date for the re-examination and informs the students involved. The re-examination is scheduled preferably within 1 or 2 months after the first exam.
3. Time and place of the re-examination are communicated via ULCN mail to the students at least two weeks prior to the re-examination.

The lecturer submits a signed list of the results of examinations to the Graduate School Office. For each individual grade such as for a research project, training project or colloquium, the responsible lecturer will hand in a signed training project evaluation or a colloquium grading form at the Graduate School Office. Students can check their examination results via uSis.

uSis and frequently-asked-questions page

In uSis – <https://usis.leidenuniv.nl> – all student information such as addresses, programs and grades are registered. Students can monitor their own progress. Registration for examinations is obligatory and should be done via uSis. More information on the system and manuals can be found on <http://www.usishelp-en.leidenuniv.nl>

A frequently-asked-questions page in English is available at:

<http://media.leidenuniv.nl/legacy/usis-faq-en.pdf>

For uSis specific questions, you may send an e-mail to: usis-fwn@edufwn.leidenuniv.nl.

Graduation and Exit

After completion of the MSc programme you will receive your diploma. However, graduation requires some planning, starting at least two months before the desired graduation date! First of all, it is your own responsibility to check that all grades (of courses, research projects) are registered in uSis, and to undertake action if a grade seems to be missing. Send an e-mail to the [study coordinator](#), stating that your masterplan is final and that you are ready to graduate and to arrange for an exit interview. In this exit interview with the study coordinator the student's opinion and evaluation on the program are registered.

The formal certification date, the date printed on the diploma, is the last working day of the month in which a student completes the last study component of the MSc programme (usually colloquium or Thesis Talk). After the certification of the diploma the formal graduation ceremony can be scheduled on the next available graduation date (usually every 3rd Tuesday of the month, with the exception of July and October). In the graduation agenda the potential graduation dates are listed.

Important notice: *students expecting to finalize their last study component in July or August, and wishing to have their graduation ceremony in August or September have to announce this at the Graduate School Office BEFORE July 1! If you fail to do so the graduation ceremony can only take place in November.*

Graduation Procedure

At least six weeks before the certification date (i.e. at least 8 weeks before the desired graduation date) the student should hand in the following documents at the Graduate School Office (B114, Chantal van den Berge):

- A print of the curriculum of the MSc programme (masterplan). The masterplan will be checked and signed for approval at the Graduate School Office by the secretary of the Board of Examiners.
- copy of the front page of the final written report of each research training project, as well as SBB or SCS report(s);
- copy of the front page of the colloquium essay (research specialisation only);
- students having a BSc LST also have to hand in the diploma supplement ("cijferlijst") of their BSc diploma.

A single missing grade should be handed in at least before the end of the month preceding the graduation ceremony. E.g. for graduation in November all results must be registered before the last working day of October. In that case students can also end their registration at the University. For further details contact the Graduate School Office (Gorlaeus Laboratories, B114).

The Graduate School Office will perform a final check on the registration of all exam results. The student will be informed about the exact time and place of the graduation ceremony. The graduation ceremony comprises a short public presentation by the student and questioning of the graduation committee, after which the student will receive the official documents.

Graduation dates 2017-2018

The graduation ceremonies of the MSc Chemistry and MSc Life Science & Technology always take place on a Tuesday. The following dates are available for the academic year 2017-2018:

19 September 2017*	16 January 2018
21 November 2017	20 February 2018
19 December 2017	20 March 2018
	17 April 2018
	15 May 2018
	19 June 2018
	21 August 2018
	18 September 2018**

* Available only for students who have finalized **all** their subjects before August 31, 2017.

** Available only for students who have finalized **all** their subjects before August 31, 2018.

There will be **no** graduation ceremony in October!

Studying abroad during your Leiden MSc Program

Students who are enrolled in one of the Leiden University MSc-programs can choose to spend some time abroad. It is the policy of the University to stimulate this, in order to broaden the students' horizon and improve their academic and language skills. Especially students who are enrolled in the research specialization are advised to spend some time abroad.

Leiden has many bilateral exchange and cooperation agreements with universities all over the world, including many who belong to the top. First of all, Leiden University participates in the European Union's Erasmus program. This program offers many possibilities to follow courses or to do a research training project at one of the universities in the European Union.

Beside this, there are many exchange agreements with universities outside of Europe such as the United States, Canada, Australia, Japan, South Africa and Korea. Students can also ask their academic staff members to recommend an international institute. More information on study abroad during your study can be found at: <http://www.students.leiden.edu/your-study/study-abroad>

Conditions

Students who want to spend some time abroad have to meet certain conditions. First of all the Board of Examiners has to approve the study program you intend to follow.

Furthermore, you must have the right academic qualifications and language skills for the intended program. You can study abroad one semester or a full academic year. Students of the Faculty of Science should always contact Ms. Gloria Schildwacht for information, registration, selection, introduction to host university, safety regulations, scholarships, etc.

Scholarships and tuition fee

Several scholarships are available for outgoing students, such as the Erasmus scholarship if you stay in Europe and the Lustra scholarship if you go outside of Europe. Students enrolled in a 2-year (research) master program can apply for the Outbound Study Grant. Selected students who go abroad to an exchange partner institute do not have to pay tuition fee to the guest university, because they are already enrolled at Leiden University.

Contact and Information

Ms. Gloria Schildwacht,
International Office of the Faculty of Science
Gorlaeus Laboratories, room B113
Einsteinweg 55
2333 CC Leiden
Phone: 071-527 57 83
Email: outgoing@science.leidenuniv.nl Study associations: CDL & LIFE

Life Science & Technology Study Association LIFE

Study association LIFE was founded on the 9th of September 1999 for the interest of all the Life Science & Technology (LST) students. With 30 members, all first cohort LST students, the first committees were installed and activities were organised. After ten years LIFE has developed into a full-grown study association with over 500 members and is still expanding each year. The study association has a lot to offer its members under guidance of a fulltime board. With 30 installed committees, existing of approximately 200 active members, LIFE provides a supplement to the education program of LST by organising excursions to companies and social activities. Study association LIFE operates as an intermediary between companies and its members. Many contacts are already established over the years with companies in the Netherlands and abroad. Members are brought in contact with the corporate world and research in the field of life sciences and technology. To achieve this, activities are being organised in cooperation with companies. For example excursions, workshops, trainings and lectures are organised annually. LIFE also takes care of supplying study books and lab equipment for reduced prices throughout the year. The association ensures feedback on the education program of LST and ensures evaluation meetings for both bachelor and master students. Each year a Benelux study trip is organized for first year students and a European study trip for bachelor students. Once every two years an intercontinental study trip is organised for master students. The aims of these study trips are to visit interesting companies and research groups abroad and to become familiar with other cultures. Each two months LIFE brings a journal with a report of all activities, interesting BSc and MSc reports, and interviews concerning interesting functions within companies and research groups. Furthermore LIFE organises Life Science symposia and congresses within this interesting field of science. Regularly LIFE also organises activities with related study associations in the Netherlands. These are only a few of the services LIFE provides. An interesting and joyful year is being realized by LIFE for all LST students.

Contact information: <http://www.svlife.nl/contact>

Chemistry Study Association CDL

The 'Chemisch Dispuut Leiden' (CDL) has been the study association for Chemistry students at Leiden University since May 20th 1926. Since 2006, CDL also represents students from the bachelor study Molecular Science & Technology.

The CDL has an annual book market where we offer study books for a reduced price. Furthermore, we offer exams from previous years on our website to give our members an idea of what they can expect from examinations still to come. We provide the opportunity to get an idea about career prospects by organising excursions and lectures, about career opportunities or research subjects.

Besides these study-related activities the CDL also likes to create a positive atmosphere among the Chemistry students. In order to do this we organize activities such as: weekly drinks in the Science Club, laser gaming, parties and other fun activities. Together with the other study associations of the Faculty of Science we organize the annual 'Bètagala' (a ball for all students of our Faculty) and the Science Career Event, a great way to gain more information about a large number of companies. Together with the chemistry study associations from Amsterdam and Utrecht we organize the annual PAC symposium, a day full of interesting lectures from renowned researchers, including a great diner and party afterwards. We also issue our magazine called 'Chimica acta Lugduni' four times a year.

Our office is located next to the main entrance of the Gorlaeus Laboratories. The board is present daily from 09.30 until 17.30 p.m. Our members often drop by for a cup of coffee or a cup of tea – both of which are free – or just to relax and have a chat.

We look forward to meeting you!

T: 071-5274502

E: Bestuur@chemischdispuutleiden.nl

W: www.chemischdispuutleiden.nl

Leiden University Address Information

- **MSc Program Life Science and Technology**

Study coordinator Dr. M. E. Kuil

Betacampus, Room EM3.16

PO Box 9502

2300 RA Leiden

Phone +31-71-527 4416, E-mail msc-coordinator@lic.leidenuniv.nl

- **Graduate School Office (Educatief Centrum)**

Drs. C. M. van den Berge

Gorlaeus Laboratories, room B114

Einsteinweg 55

2333 CC Leiden

Phone: (071) 527 5762

Email: berge@edufwn.leidenuniv.nl

Opening hours: Monday to Thursday 10.00-15.00

- **International Office of the Faculty of Science**

Ms. G. Schildwacht

Gorlaeus Laboratories, room B113

Einsteinweg 55

2333 CC Leiden

Phone: (071) 527 57 83

Email: outgoing@science.leidenuniv.nl

- **ICT services / facilities**

ICT contact person Dhr J. Detollenaere

ICT Helpdesk Gorlaeus Monday/Friday, 9.00-17.00

Gorlaeus Laboratories Room L103

Phone: 071 - 527 8888

Fax: 071 - 527 6967

Email: helpdesk@issc.leidenuniv.nl

ICT for Students <http://issc.leiden.edu/ict-students>

- **Front Office Student Affairs / [Plexus Student Centre](#)**

The staff of the Front Office can provide information on the following subjects:

- Student registration / termination of registration, tuition fees

- Dutch student loans (studiefinanciering), completing forms
- Questions about applications for admission to Bachelor's and Master's programs & Study Abroad and exchange programs
- Illness and delayed study progress and the student financial support regulation 2000 (i.e. the Afstudeerfonds)

Contact form: <http://www.students.leiden.edu/form-front-office>

Kaiserstraat 25

2311 RA Leiden

Tel: 071-5278011

Visiting hours: Monday, Wednesday, Friday 09.00 – 17.00,

Tuesday and Thursday 09.00 – 21.00

- **PITSstop**

(Study guides for other universities in the Netherlands, info on studying abroad, the employment market, application procedures and university regulations).

Plexus Student Centre, address: see above

Telephone: 071-5278025

The International Office holds a consultation session at the Meeting Point every Monday and Thursday from 13.00 – 17.00.

pitsstop@sea.leidenuniv.nl

<http://www.studenten.leidenuniv.nl/organisatie/pitsstop>

- **Student Career Service**

The Career Service offers support if you have questions about your career, your personal profile, the job market and job applications. Are you looking for career advice? Why don't you get in touch with one of our career advisors. Every Tuesday and Thursday the career counsellor is available for all your career-related questions, advice on your CV or LinkedIn profile or for labour market information.

Ms. Tanja Bos, Gorlaeus Laboratories, room B110

Telephone: 071-5278025

E-mail: career@science.leidenuniv.nl

Website: <http://students.leiden.edu/career>

- **Student Counsellors**

(Advice on financial problems, problems with study progress, legal position, students who are involved in top-level sports, students with a handicap)

Plexus Student Centre, address: see above

Telephone: 071-527 8026 and 071-527 8011

Open consultation session: Monday to Friday 15.30 – 16.30

decanen@sea.leidenuniv.nl

<http://students.leiden.edu/your-study/guidance>

- **Student psychologists**

(Advice on any problem, like family problems, concerns about social contacts, feelings of depression and relationship problems; there are courses and training sessions available)

Plexus Student Centre, address: see above

Telephone: 071-527 8026

Open consultation sessions: Monday to Friday 11.00 – 12.00 Appointments possible:

Monday to Friday 09.00 – 17.00

psychologen@sea.leidenuniv.nl

<http://students.leiden.edu>

- **Ombudsperson**

For complaints about the behaviour of a staff member or an administrative body of Leiden University, one can apply to the ombudsperson. He or she is independent and handles complaints in strict confidentiality. Anonymous complaints cannot be dealt with.

Plexus Student Centre, address: see above

Telephone: 071-527 3657

ombudsfunctionaris@leidenuniv.nl

<http://students.leiden.edu>

- **(Sexual) Harassment**

For any cases of sexual harassment, bullying at work, aggression, violence and discrimination you may report.

Address: Occupational Health Department (GBGD),

Poortgebouw Zuid (3rd Floor),

Rijnsburgerweg 10,

2333 AA Leiden

Telephone: 071-527 8015

Other useful addresses

- **‘Dienst Uitvoering Onderwijs’ (formerly IBG)**

Regiokantoor DUO (Regional Office)

Koninginnegracht 12b/13, 2514 AA Den Haag,

tel. 050 599 77 55

Office hours: Monday through Friday from 9:00 to 17:00 o'clock, vrAGEN@ocwduo.nl

www.ocwduo.nl

- **Studentenhuisvesting**

Non-commercial Leiden's Student Housing

<https://www.duwo.nl/en/home>

Safety Information Gorlaeus Laboratories - Leiden University

What to do in case of a fire, incident or other calamity?

Do Not Call 112!

but

Call the **Emergency Number 4222** (see the orange sticker on the phone or after office hours: 4444)

In case of fire

Activate the fire-alarm button

In case of a starting or small fire:

- Try to extinguish the fire using the handheld extinguisher or fire hose

In case of a large fire:

- Close doors and windows

- Go to the meeting point* (restaurant or car park)

and *follow instructions of the first-aid-personnel (BHV-ers)*

What to do if the alarm signal (“Slow Whoop”) sounds?

- Close windows, leave the room and close the door

- Follow the escape route (green pictograms)

In case of fire use the stairs and NEVER the elevator!

Go to the meeting point* (restaurant or car park);

DO NOT go home: All people who were present in the building have to be registered

DO NOT make the firemen look for you unnecessarily

Always follow the instructions of the firemen or the first-aid personnel (BHV-ers)

What to do when a dangerous situation is discovered?

Fill out a registration form digitally on <http://amd.leidenuniv.nl>

Or: Fill out the red paper form available at the reception

Or: Contact the safety officer of the faculty:

amd@science.leidenuniv.nl, 071 – 527 4333

* Meeting points are indicated in the evacuation plan (ontruimingsplan) of each building. This plan is available at the reception of the Gorlaeus Laboratories.