



**Amsterdam University College**  
***Excellence and Diversity in a Global City***  
**AUC Course Catalogue 2013-2014**



# AUC Course Catalogue

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## Description of Courses in the Academic Core

### **900111ACC Academic English I**

<i>Credit points</i>	6 ecp
<i>Theme</i>	n/a
<i>Track</i>	n/a

#### *Prerequisites*

All students (apart from native speakers) should have exit level grade 8 in English VWO (or comparable). Remedial grammar work will be offered via self-study.

#### *Course description*

Academic English I is an introduction to academic study and the foundational skills required for becoming a successful member of an interdisciplinary academic community. The syllabus reflects a progression of competence in the primary skills of academic reading, research, writing, and presentation (i.e. several activities build on each other). Activities will combine different media and will draw on the range of six AUC themes, emphasizing interdisciplinarity and diversity, demonstrating contemporary relevance and a global perspective, and – importantly - reflecting students' own interests. The course will accommodate different learning methods and styles and will provide students with detailed feedback on their writing. Each section of the syllabus will involve both a theoretical and a practical dimension, encouraging reflection and enabling students to learn by doing. The course culminates in an interdisciplinary academic conference, during which students actively participate in producing and responding to a series of formal research presentations.

Students will:

- learn how to recognize and practice different genres and modes of academic discourse;
- improve reading comprehension and efficiency;
- learn how to handle reading material in an objective and critical manner;
- learn about and practice different genres of academic writing;
- develop the writing skills appropriate to different disciplines;
- learn how to recognize and apply different research methodologies;
- work independently and as part of a collaborative group;
- develop vocabulary appropriate to an academic environment;
- improve listening comprehension and develop presentation skills;
- participate in discussions and debates, and prepare presentations.

### **900121ACC Basic Research Methods and Statistics**

<i>Credit points</i>	6 ecp
<i>Theme</i>	n/a
<i>Track</i>	n/a

#### *Prerequisites*

Mathematics at exit level VWO Wiskunde A or B (or comparable). Remedial classes will be offered for students with deficiencies.

### *Course description*

This course provides a general introduction into the methods of behavioural and social research. It covers four general fields: the foundations of behavioural and social sciences, research design, data collection and data analysis.

Topics include:

- The role of theory
- Causality
- Descriptive, explorative and testing research
- Empirical cycle
- Conceptualisation and scale construction
- Populations and samples
- Research designs
- Experimental and quasi-experimental designs
- Survey research
- Independent, dependent, control and confounding variables
- Validity and reliability
- Collecting and representing data
- Descriptive statistics (mean, variance, standard deviation)
- Introduction to basic stochastics (probability, discrete and continuous stochastic variables)

At the end of the course students are able to understand and evaluate elementary statistical and numerical reasoning. They acquire a basic knowledge of research methods and statistics and are able to apply descriptive statistical methods. Part of the course is dedicated to the practical application of these skills.

### **900124ACC/SCI    Calculus for Economics**

*Credit points*                      6 ecp

*Theme*                                    n/a

*Track*                                     n/a

### *Prerequisites*

Mathematics at exit level Wiskunde A or B (or comparable).

### *Course description*

This course is intended for potential Social Science majors who are planning to study economics courses such as Fundamentals of Micro- and Macro Economics (200-level) and the advanced economics courses (300-level). This course provides an introduction to the Calculus of real-valued functions. It introduces some of the essential analytical tools of the Sciences, such as differentiation and integration, series expansions, differential equations and optimization. We will carefully define important mathematical concepts such as continuity and convergence and make it clear how Calculus is applied in Economics. Topics to be covered are:

- Inequalities
- Polynomials, functions, graphs
- Limits and continuity
- Differentiation
- Exponential, logarithm, trigonometry
- Linear approximations and Taylor polynomials
- Integration techniques, the fundamental theorem
- Functions of more variables: partial differentiation
- Optimization, the method of Lagrange multipliers
- Double integration



At the end of the course students will be familiar and comfortable with the basic concepts of Calculus described above. Moreover, they will be aware of the importance and applicability of Calculus in the Sciences.

### **900125ACC Calculus**

*Credit points*            6 *ecp*

*Theme*                    *n/a*

*Track*                     *n/a*

#### *Prerequisites*

Mathematics at exit level Wiskunde B or D (or comparable). Remedial classes will be offered for students with deficiencies.

#### *Course description*

This course provides an introduction to the calculus of real-valued functions of one variable. It introduces some of the essential analytical tools of the sciences, such as differentiation and integration, series expansions, differential equations, optimization and complex numbers. We will carefully define important mathematical concepts such as continuity and convergence. Occasionally, we stress the necessity of strict definitions and rigorous proofs. At the same time, we will point out how calculus is applied in physics, engineering, economy and biology.

Topics include:

- Limits and continuity
- Differentiation: definition, meaning and rules; extreme values
- Inverse functions, exponential and logarithmic functions
- Linear approximations and Taylor polynomials
- Integration, sums and areas, the fundamental theorem
- Methods for computing antiderivatives
- Applications of integration to area, volume, lengths of curves
- First and second order differential equations
- Sequences, series and power series
- Complex numbers

Students will also practice exercises in-class to improve their skills.

### **900127ACC Linear Algebra**

*Credit points* 6 *ecp*

*Theme* *n/a*

*Track* *n/a*

#### *Prerequisites*

Calculus

#### *Course description*

Linear algebra is a branch of mathematics that turns up in an enormous variety of contexts. One reason is that many processes can be described with reasonable accuracy by a linear approximation (in which nonlinear interactions are neglected). Another reason is that some mathematical objects have an intrinsically linear structure (e.g. in group theory and geometry). This course aims to develop a good understanding of concepts and ideas in linear algebra, as well as the ability to perform matrix computations. We also discuss applications in physics,

engineering, business and biology. These include Googlerank, curve fitting, linear regression, Markov chains, Leslie matrices and linear differential equations.

Topics include:

- Linear equations, matrices and vectors
- Subspaces, dimension and rank
- Matrix with respect to a pair of bases (linear operators)
- Projections
- Determinants
- Eigenvalues, eigenvectors, diagonalisation
- Inner products and orthogonality
- Singular Value Decomposition
- Least square method, curve fitting
- Unitary, symmetric and self-adjoint matrices
- Jordan normal form
- Systems of linear differential equations

**900131ACC Dutch A1**

**900132ACC Dutch A2**

*Credit points*                6 *ecp*

*Theme*                         *n/a*

*Track*                         *n/a*

*Prerequisites*

None

Students will take a diagnostic test prior to the language course.

*Course description*

Students learn to handle a variety of uncomplicated, basic communicative tasks, including understanding spoken Dutch, answering questions and reading texts. Common European Framework of Reference for languages levels A1 and A2.

**A1** Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce him/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has. Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.

**A2** Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.

Students learn essential verbs, nouns and cases while working to build vocabulary and learn the basics of Dutch grammar and syntax. Students practice listening, speaking and reading skills. Students will also be introduced to Dutch culture through short texts from the internet, magazines and newspapers.

**900133ACC French A1****900134ACC French A2**

Credit points 6 ecp

Theme n/a

Track n/a

*Prerequisites*

None

Students will take a diagnostic test prior to the language course.

*Course description*

Students learn to handle a variety of basic communicative tasks, including understanding spoken French, speaking French, reading texts and writing short texts. Common European Framework of Reference for languages levels A1 and A2.

**A1** Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce him/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has. Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.

**A2** Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.

Students learn essential verbs, nouns and cases while working to build vocabulary and learn the basics of French grammar and syntax. Students practice listening, speaking, reading and writing skills. Students will also be introduced to French culture through short texts from the internet, magazines and newspapers.

**900135ACC German A1****900136ACC German A2**

Credit points 6 ecp

Theme n/a

Track n/a

*Prerequisites*

None

Students will take a diagnostic test prior to the language course.

*Course Description*

Students learn to handle a variety of basic communicative tasks, including understanding spoken German, speaking German, reading texts and writing short texts. Common European Framework of Reference for languages levels A1 and A2.

**A1** Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce him/herself and others and can ask and answer questions about personal

details such as where he/she lives, people he/she knows and things he/she has. Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.

**A2** Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.

Students learn essential verbs, nouns and cases while working to build vocabulary and learn the basics of German grammar and syntax. Students practice listening, speaking, reading and writing skills. Students will also be introduced to German culture through short texts from the internet, magazines and newspapers.

**900137ACC Spanish A1**

**900138ACC Spanish A2**

*Credit points* 6 ecp

*Theme* n/a

*Track* n/a

*Prerequisites*

None

Students will take a diagnostic test prior to the language course.

*Course description*

Students learn to handle a variety of uncomplicated, basic communicative tasks, including understanding spoken Spanish, answering questions and reading texts. Common European Framework of Reference for languages levels A1 and A2.

**A1** Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce him/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has. Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.

**A2** Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.

Students learn essential verbs, nouns and cases while working to build vocabulary and learn the basics of Spanish grammar and syntax. Students practice listening, speaking and reading skills. Students will also be introduced to Spanish culture through short texts from the internet, magazines and newspapers.

**900139ACC Arabic I**

*Credit points* 6 ecp

*Theme* n/a

Track n/a

*Prerequisites*

None

*Course description*

The Arabic language consists of two varieties: Modern Standard Arabic, which is used in writing, in the media and in formal speech, and colloquial Arabic, which refers to the different regional dialects that are used in informal speech. Modern Standard Arabic is understood by educated Arabic speakers across the Middle East and North Africa. In this course, students will learn the Arabic alphabet, as well as basic grammatical structures, syntax and vocabulary of Modern Standard Arabic. Students will also be introduced to the culture of the Arab world through short texts from the internet, magazines and newspapers.

Upon completion of the course, students will be able to read and write the Arabic alphabet. Students learn to handle a variety of uncomplicated, basic communicative tasks, including understanding spoken Modern Standard Arabic, answering questions and reading texts.

**900141ACC The Global Identity Experience**

*Credit points* 6 ecp

*Theme* n/a

*Track* n/a

*Prerequisites*

None

*Course Description*

The world is composed of a large variety of peoples and cultures, some constituting large majorities (in number, or merely in terms of power), others forming small minorities. In a sense, multicultural diversity is of all times. Relatively new is the emergence of modern nation states and ensuing, often official cultural communities with clearly articulated boundaries. There is, however, nothing static about this situation. Group-formation processes are ongoing historical processes which include outcomes of continuing political struggle, economic development, modernization and various globalisation processes (influence of mass media, migration, etc).

The aim of this introductory course is to familiarize students with academic views and debates about the aforementioned matters. The course addresses various topics in relation to identity in a multicultural context, such as the politics of identity, transnationalism and migration, state-formation and nationalism, self-organization, politics of religion, globalisation and 'creolisation'.

The following themes are included:

- The relation between culture and ethnicity
- Nationalism and long-distance nationalism
- Colonisation and decolonisation
- Migration and transnationalism
- Identity politics and the politics of religion
- Identity and gender
- Processes of inclusion and exclusion

- Processes of labelling, classification and categorization
- Minority politics
- Politics of commodification and cultural representation

Students are theoretically sensitized to and prepared for issues arising from a multicultural context at the societal level in general as well as referring to their particular situation as students at an international college in a specific multicultural society. This will help them, on the one hand, to understand the main issues of world politics nowadays (e.g., terrorism and polarization) and, on the other hand, to cope with multicultural issues, and function academically, personally, and socially.

- Students are provided with a brief (cultural, social, and political) orientation regarding the Netherlands.
- The students' academic skill of critical self-reflection is developed.
- The students' knowledge about and skills with respect to successful intercultural communication are developed. This will assist their academic performance.
- Students are introduced to dialectical, multi-level, and multi-method thinking
- Students are provided with a platform where they can share and discuss their own experiences with culture and identity.

Throughout the course the link to students' academic and personal life and to their professional future will be emphasized.

### **900142ACC/HUM Performing Arts**

*Credit points*                      6 *ecp*

*Theme*                                      n/a

*Track*                                      *Literature, Culture*  
*(HUM)*

*Prerequisites*

None

*Course description*

Performing Arts (**theatre version, semester one**) has two principal objectives:

- 1) Using a play text as a focus, we study from various angles the ideas of a number of practitioners of *performance* over the past 100 years. How would their varying approaches to 'performance' determine a final production of our chosen play text?
- 2) Using this academic knowledge and awareness of text and performance in action, we (write and) put on a theatre production before an audience.

Thus, the theorized position of performance is brought to a practical manifestation.

The course covers the ideas of Artaud, Bausch, Beckett, Brook, Copeau, Craig, Grotowski, Lepage, Meyerhold, Piscator, Schechner, Stanislavski & Robert Wilson. Each of these practitioners of performance has been seminal in defining our understanding of the diversity of the act of performance. In studying their contributions to the field, we might establish from what theoretical positions they

work(ed), and under what circumstances their ideas are appropriate to performance today, and relevant to our own final performance.

**A musical variation (semester 2)** of this course will also be given. Students are asked to compose short examples of rap, film and video game scores, sound installations, imitate the style of other composers and accompany their music compositions with original paintings, poetry or journal writing amongst others. The goal at the end of the semester is the production of a multi-art extravaganza, which includes a concert of original music compositions, an art-video exhibition, and live improvisation involving audience participation.

**900143ACC/SSC/HUM Chinese Studies**

*Credit points*            6 *ecp*  
*Theme*                    *n/a*  
*Track*                     *Communication (HUM)*

*Prerequisites*

None

*Course Description*

Over the past three plus decades, Chinese culture has undergone tremendous changes. Starting with a historical approach to contemporary China and a short introduction to its main language Mandarin, this course will subsequently zoom in on the cultural developments in China. While focusing on contemporary culture, the course readings will remain sensitive to the political and economic context. Examples of important cultural developments that will be further analysed in this course include the rise of the avant-garde visual arts movement from the 1980s onwards, the emergence of a vivid rock and pop culture and the development of a transnational Chinese cinema. Not only global but also regional cultural flows, most notably from Japan and South-Korea to China, will be analysed. The material implications of the changes will be scrutinized.

After this course, students will have acquainted themselves with what is by many perceived as an upcoming global power, be aware of its histories (multiple, indeed), its politics, its economy and, particularly, its varied cultures both old and new. Most of all, they will become sensitive to the contradictions, contestations, inequalities and ambiguities that are always part and parcel of any understanding of Chinese cultures.

**900151ACC/SCI Big Questions in Science**

*Credit points*            6 *ecp*  
*Theme*                    *n/a*  
*Track*                     *n/a*

*Prerequisites*

None

*Course Description*

This course introduces students to exciting ideas at the forefront of scientific research, and develops the attitude characteristic of a scientific approach to the world. The course will start from the Big Questions which are currently in the news: the scientific theory necessary to analyse and discuss these big questions effectively should derive from the different questions put forward in class. The content will cover the three broad areas of Physics, Earth Sciences and Life Sciences with clear overriding themes throughout the course.

Some topics to be covered in the course are:

1. Physics: the Big Bang theory, radiation and nuclear energy, nuclear waste, the nature of science.
2. Earth Sciences: volcanoes and earthquakes, global climate change, rise in sea-level, managing environmental change.
3. Life Sciences: genetic counselling and engineering, GM-foods, evolution, cells and cancer, cognition and language.

At the end of the course the following aims will have been realised.

- Students appreciate the basic human drive for scientific enquiry.
- Students understand the connection between sciences and their meaning.
- Students will be aware of the spatial sizes and time scales of natural phenomena.
- Students understand the most important turning points in science and technology.
- Students become conversant with the interplay of science, technology and society.

This course is suitable for students planning to major in either the Social Sciences or the Humanities.

**900153ACC/HUM Big History**

*Credit points*            6 *ecp*

*Theme*                      *n/a*

*Track*                        *History (HUM)*

*Prerequisites*

None

*Course Description*

This course offers an overview of human history placed within the context of the much longer history of life, the Earth, the solar system and the universe as a whole. This approach to human history is known as Big History. More information on big history can easily be found by surfing the Internet.

Special attention will be paid to the last 10,000 years of human history, when culture took over as the main adaptive mechanism. This period witnessed the worldwide emergence of agriculture as well as the rise of state societies, while during the past five hundred years, globalization, science, industrialization, urbanization and democratization have all contributed to deeply transform human societies. During all the human history lectures we will systematically focus on how humans have been transforming their natural environment. The last lecture will deal with the question of what we may expect from the future.

Our claim is that by looking at human history from a big history perspective, it becomes possible to understand both yourself and the world around you better in a way no other approach to history offers. Furthermore, by contemplating the grand sweep of history simple general theoretical principles emerge which would otherwise have remained unnoticed. These guiding principles will hopefully help you to better understand how everything has become the way it is now, as well as what the future may bring.



The course consists of a series of about 25 lectures, followed by interactive sessions during which students will discuss important points of view and engage in challenging assignments. The required reading consists of one textbook as well as a few seminal articles.

**900154ACC/HUM Big Books**

*Credit points*            6 *ecp*  
*Theme*                      *n/a*  
*Track*                        *Literature (HUM)*

*Prerequisites*

None

*Course description*

The book is one of the strongest and most lasting bearers of intellectual heritage. For centuries human life, social debate, great ideas and revolutions have been codified in books to be activated by readers near and far in time and space. Big Books examines works of paramount importance in Western history and explores their possible meanings. We will ask questions such as who reads and has read big books? What are the effects of these books on art, society or history in general? What do these works tell us about our past and present culture? And why are big books relevant to our future? These texts of major significance from literature, philosophy, the human sciences, and politics will all be approached from a cultural and historical perspective.

This course introduces students to a number of important books in the Western tradition and will acquaint students with the historical, cultural, political and economic context of these works. In discussing these works, students will develop a keener appreciation of the various influences that we are subject to when we think about what it means to be human.

**900155ACC/SSC Big Questions in Future Society**

*Credit points*            6 *ecp*  
*Theme*                      *n/a*  
*Track*                        *n/a*

*Prerequisites*

None

*Course description*

We live in a rapidly changing society as is evidenced when we consider the digital revolution, global urbanization, and the shift in the balance of (economic and political) power between East and West. In this course we will consider the main developments and challenges facing our (global) society at the moment and what this may mean for future society. We will start with changes and developments which are apparent in present-day society and consider the political, sociological and economic consequences for these in the future. This course enables students to study these Big Questions from many different perspectives which link up to the various disciplines in the Social Sciences.

**900161ACC Logic, Information Flow and Argumentation**

*Credit points*            6 *ecp*  
*Theme*                      *n/a*  
*Track*                        *n/a*

### *Prerequisites*

None

### *Course description*

The course offers a new style of introducing logic, bringing in basic ideas from

- (a) Argumentation theory,
- (b) "Information dynamics",
- (c) Complexity and computation,
- (d) Cognitive psychology, and
- (e) Game theory.

### Topics covered:

- Basic structures in argumentation: valid and invalid patterns
- *Propositional logic*: classification, information update, understanding the mathematical system behind reasoning patterns
- Difficulties with propositional reasoning in practice: key psychological experiments, and new logic models for these
- Information flow in questions and answers; agents and mutual knowledge
- Connections with natural language and linguistics
- *Epistemic logic* as a practical system for interactive reasoning, solving puzzles, and connections to information exchange, security, etc.
- *Dynamic logic* and computation: control structures in conversation, argumentation, and action in general
- Complexity: a sense for different levels of difficulty in (logical) tasks
- Interaction and games

The skills aspects of the course will be balanced with lectures placing logic in a historical and philosophical context. Students acquire basic knowledge of logic, argumentation, computation, and information, and become acquainted with applications in other disciplines.

### *Special Interest*

The course will be internet-based, with various supporting tools, and it is part of a worldwide experiment in creating a new open course approach to logic, sponsored by the Dutch Ministry of Education. For the team behind this, see <http://science.uva.nl/~jasparas/LIA/LO>

## **900211ACC Academic English II**

*Credit points*                      6 *ecp*

*Theme*                                      *n/a*

*Track*                                        *n/a*

### *Prerequisites*

Academic English 1

### *Course description*

Academic English II is designed to consolidate and further develop the academic skills addressed in the foundation course Academic English I. The primary focus of the programme is to support students through an extended period of research and writing that reflects the experience of preparing and producing the undergraduate 'capstone' dissertation. Students will investigate and evaluate the quality and content of professional academic writing within their discipline in order to write a research proposal and a formal journal article that engages with their own (inter)disciplinary interests and expertise. As students produce their

individual written assignments, they will also be encouraged and enabled to work collaboratively with peers. The course culminates in an event modelled on a particular genre of academic conference experience, in which participants share their individual and collaborative research activities in the form of a professional poster presentation. The final research article will be published in a series of periodicals, designed by the class, which will be placed in the AUC library for consultation by students and faculty, and which will be eligible for inclusion in AUC's annual journal publication.

### **900221ACC Basic Research Methods and Statistics II**

*Credit points*                      6 *ecp*

*Theme*                                      *n/a*

*Track*                                        *n/a*

#### *Prerequisites*

Basic Research Methods and Statistics

#### *Course content*

This course builds on the skills developed through BRMS (1<sup>st</sup> year course). The students will learn various quantitative approaches which are commonly used in social science research.

The main aim of the course will be to teach students the ability to understand, conduct and interpret quantitative analyses of various empirical studies. Students will also conduct their own research project and regularly read and discuss method and results sections of empirical research articles from various disciplines.

As in BRMS, we will continue to cover all discipline-independent aspects of creating new knowledge:

- How to formulate a scientific question
- How to plan an investigation bearing on that question
- How to conduct the inquiry
- How to present the data that result from your research
- How to interpret your results, and extrapolate beyond your data
- How to report the results in an appropriate way

The central question we will address in this course is: How do I design and analyse research so that it will yield conclusions that are acceptable to critical peers?

At the end of the course the student can;

- Explain the basic ideas of item-response theory.
- Understand the conceptual meaning of reliability and validity
- Understand the meanings of and relationships between p-value, effect size and sample size.
- Choose an appropriate technique to analyse data, based on a short description of a research design and question
- Understand and can apply the following statistical analyses using SPSS: correlation, linear regression (simple and multiple), mediation analysis, 1-way & 2-way ANOVA, post hoc procedures, and interaction analyses
- Critically read and understand the basics of methods and results sections in empirical papers from different fields.
- Design and conduct independent research to solve basic research questions

The course will be an alternating series of interactive lectures and practicals in which students learn the theoretical background as well as the application of several statistical techniques, including correlations, regressions, Chi-Square tests, t-tests, and ANOVAs. The practicals will mostly be used to learn coding, analysing, reporting and interpreting data using SPSS.

**900222ACC/SSC    Qualitative Research Methods**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>n/a</i>
<i>Track</i>	<i>n/a</i>

*Prerequisites*

Students are required to have completed at least one 100-level course in the social sciences.

*Course description*

Qualitative methods in empirical research can be considered a craft to be studied and trained. All senses are used, consciously or not, to make sense of (social) realities encountered in the field and in trying to construct research data and to give theoretical meaning, i.e interpret, them in order to try and answer a pre-formulated research question. This course will cover subjects like:

- Qualitative research methods in empirical research;
- Empathy and qualitative research methods;
- Senses in qualitative research methods;
- Sensory experiences and theoretical interpretation;
- Sensing what is not noticed;
- Reflexivity and the senses.

In order to try and understand the Other, empathy is considered a foundational skill. But how far does empathy reach? What is its potential and what are its limitations in qualitative research? Sensory experiences are essential to accessing empirical data. But how do you use your senses in qualitative research and how 'scientific' is it? Qualitative research data need theoretically informed interpretation for meaningful analysis. Being aware of theoretical orientations and paradigms is crucial to this process. Reflexivity is trying to make sense of the interrelated conscious and unconscious processes of data construction in qualitative research. Ethnographic texts are one way of reporting on the outcomes of qualitative research methods. What are the criteria for writing good ethnography?

At the end of the course the student can;

- Use 'the full body' of qualitative research methods in empirical research;
- Note down qualitative data in empirical / fieldwork research;
- Can reflect critically upon his or her own use of qualitative research methods;
- Develop experiments to train the various senses in qualitative research methods;
- Theoretically interpret and analyse empirical data;
- Critically assess texts on qualitative research methods;
- Critically debate methodological issues in empirical research.

**900271ACC Dutch B1.1**

**900272ACC Dutch B1.2**

*Credit points* 6 ecp

*Theme* n/a

*Track* n/a

*Prerequisites*

Dutch A2

*Course description*

This course aims at improving and developing skills and strategies to enable students to handle successfully more complicated oral and written tasks in Dutch.

Common European Framework of Reference for languages levels B1.1 and B1.2 (Intermediate)

Course outcomes:

Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes & ambitions and briefly give reasons and explanations for opinions and plans.

Students will increase their general vocabulary of verbs, nouns, articles and prepositions while gaining a greater knowledge of complex problems in Dutch grammar and syntax. Students will continue to learn about Dutch culture through short stories, novellas, films and TV programmes. Students will also be required to submit book reports and short essays.

**900273ACC French B1.1**

**900274ACC French B1.2**

*Credit points* 6 ecp

*Theme* n/a

*Track* n/a

*Prerequisites*

French A2

*Course description*

This course aims at improving and developing skills and strategies to enable students to handle successfully more complicated oral and written tasks in French.

Common European Framework of Reference for Languages levels B1.1 and B1.2 (Intermediate)

Course outcomes:

Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes & ambitions and briefly give reasons and explanations for opinions and plans.

Students will increase their general vocabulary of verbs, nouns, articles and prepositions while gaining a greater knowledge of complex problems in French grammar and syntax. Students will continue to learn about French culture through short stories, novellas, films and TV programmes. Students will also be required to submit book reports and short essays.

**900275ACC German B1.1**

**900276ACC German B1.2**

*Credit points* 6 *ecp*

*Theme* n/a

*Track* n/a

*Prerequisites*

German A2.

*Course description*

This course aims at improving and developing skills and strategies to enable students to handle successfully more complicated oral and written tasks in German.

Common European Framework of Reference for Languages levels B1.1 and B1.2 (Intermediate)

Course outcomes:

Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes & ambitions and briefly give reasons and explanations for opinions and plans.

Students will increase their general vocabulary of verbs, nouns, articles and prepositions while gaining a greater knowledge of complex problems in German grammar and syntax. Students will continue to learn about German culture through short stories, novellas, films and TV programmes. Students will also be required to submit book reports and short essays.

**900277ACC Spanish B1.1**

**900278ACC Spanish B1.2**

*Credit points* 6 *ecp*

*Theme* n/a

*Track* n/a

*Prerequisites*

Spanish A2.

*Course description*

This course aims at improving and developing skills and strategies to enable students to handle successfully more complicated oral and written tasks in Spanish.

Common European Framework of Reference for Languages levels B1.1 and B1.2 (Intermediate)

Course outcomes:

Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes & ambitions and briefly give reasons and explanations for opinions and plans.

Students will increase their general vocabulary of verbs, nouns, articles and prepositions while gaining a greater knowledge of complex problems in Spanish grammar and syntax. Students will continue to learn about Spanish culture through short stories, novellas, films and TV programmes. Students will also be required to submit book reports and short essays.

**900239ACC Arabic II**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>n/a</i>
<i>Track</i>	<i>n/a</i>

*Prerequisites*

Arabic I

*Course description*

In this course, students will learn new grammatical structures, syntax and vocabulary. The course will focus on the four language skills: reading, writing, speaking and understanding Arabic. Students will continue to learn about the culture of the Arab world through watching television programmes and reading articles from newspapers and magazines. Students will complete a number of assignments, including writing exercises and listening exercises.

**900241ACC/HUM Amsterdam in the Golden Age**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>n/a</i>
<i>Track</i>	<i>History, (HUM)</i>

*Prerequisites*

None

*Course description*

The Golden Age, which corresponds roughly with the 17<sup>th</sup> century, was an extremely important period in Dutch history. The enormous increase in trading activity at that time not only increased social mobility but produced a wealthy merchant class. This merchant class was important for patronage of the arts, literature and science and the merchants were also in a position to influence urban planning and architecture of that time. Topics to be covered in the course include colonialism and trade; scientific discoveries; navigation; the Dutch East India Company and the Amsterdam Bank; tulip fever; the perceived tradition of

religious tolerance in the Netherlands; still-life painting; the Dutch political scene and the Dutch Republic in 17<sup>th</sup> century Europe.

Students will learn about historical developments in the Dutch Republic that made the 17th century such an important period for The Netherlands, the 'Golden Age', and will trace the significance of these developments to the present day.

**900242ACC/SSC Global Leadership**

*Credit points* 6 ecp

*Theme* n/a

*Track* n/a

*Prerequisites*

100-level course The Global Identity Experience

*Course Description*

This course follows up on the 100-level Global Identity Experience course and will look at the interdisciplinary study of the important elements of global leadership such as cross-cultural awareness, power distance indices etc. A key competency for global leaders is cultural self-awareness which is the realisation that one's own leadership practices are shaped by a particular environment and that there are other equally, or perhaps more viable ways of getting things done in a different context. The GLOBE dimensions (which follow on from Geert Hofstede's research) of culturally endorsed implicit leadership will be studied. This course will also link into civic engagement and ethical leadership questions and increase understanding of how human behaviour affects the functioning of an organisation in complex and dynamic environments.

**900243ACC/SCI/SSC/HUM Gastronomy: the Arts and Sciences of Cooking**

*Credit points* 6 ecp

*Theme* n/a

*Track* n/a

*Prerequisites*

At least one 100-level science course (not including Big Questions in Science). Only for second and third year students.

*Course Description*

Gastronomy: The Arts & Sciences of Cooking epitomizes the liberal arts and sciences philosophy, because it focuses on the applications of sciences (physics, chemistry & biology) in one of the most basic life skills, that of cooking. The course puts cooking into a broader societal and cultural perspective by using insights and theories from the social sciences and humanities. Among the topics covered are physics of heat, (micro)biology of foods, the chemistry of flavours, neuro-gastronomy, food culture and history, and food in arts. This course will not only be theoretical and discursive, but will also contain cooking exercises and lab sessions.

**900261ACC/HUM Philosophy**

*Credit points* 6 ecp

*Theme* n/a

*Track* n/a



### *Prerequisites*

None

### *Course Description*

In this course, which will consist of lectures and thematic workshops, students will be introduced to great philosophical questions and will be made aware of how some of history's greatest philosophers have approached these questions. Students will also learn how to frame philosophical questions of their own and use philosophical methods to address them. Topics will include human function and moral virtue, the nature of good and evil, the nature of freedom and free will and personal identity. Some questions to be considered are:

- What is knowledge?
- If God exists, why do bad things happen in the world?
- Do we have free will?
- What to do (in a moral sense)?

At the end of this course;

- The student is able to understand a number of important philosophical concepts and arguments.
- The student is able to locate these arguments and concepts in a broad picture of western intellectual history.
- The student is able to analyse the arguments and engage critically with them.
- The student is able to present and discuss philosophical arguments systematically.
- The student is able to write short philosophical papers.

## **900262ACC/HUM Philosophy of Science**

*Credit points*            6 ecp

*Theme*                      n/a

*Track*                        n/a

### *Prerequisites*

Students are recommended to have completed at least two courses in their major.

### *Course description*

In this course students will become acquainted with the most important ideas and analytical tools of philosophy of science, and they will develop the skills to use these tools and ideas for reflecting on the nature of contemporary scientific knowledge and its role in today's culture and society.

After a brief introduction in which the aims and the significance of philosophy of science will be discussed, and its historical origins sketched, the course will focus on the issue of the unity of science. While traditional philosophy of science, in particular the logical-positivist movement, regarded science as essentially unified, this idea has been challenged in recent times. We will study the question of whether contemporary science is unified or dis-unified from three different perspectives. First, the methodological point of view: Are disciplinary methods fundamentally different or are they species of a single scientific method? Second, the issue of reductionism: Are the different sciences autonomous or is there a (hierarchical) relation between them? What does this imply for our view of the world and for the ways in which societal problems can be approached scientifically? Third, the debate about the nature of scientific explanation: Is there

an essential difference between types of explanation and understanding in the natural sciences, social sciences, and humanities?

Subsequently, we will apply our findings to the theme of interdisciplinarity. What does an interdisciplinary approach consist of, and what are the conditions for fruitful interdisciplinary research? We will apply our analysis of interdisciplinarity to concrete cases from the six themes in the AUC curriculum. Finally, we will investigate the impact of science on contemporary society and culture. Throughout the course we will draw on examples from the physical and biological sciences, as well as the social sciences and humanities. Students will be encouraged to relate the philosophical ideas and tools to their own specific fields of interest.

Students will be provided with key concepts and approaches in contemporary philosophy of science and with the analytical tools needed for a considered reflection on the nature of scientific knowledge and its roles in today's culture and society.

### **900263ACC/SSC/HUM Ethics**

*Credit points*            6 ecp

*Theme*                      n/a

*Track*                        n/a

#### *Prerequisites*

Students are recommended to have completed at least two courses in their major.

#### *Course description*

What is the right thing to do? Do I really have a moral responsibility to others? Are there good reasons to act morally? Does morality have any foundation? This course in ethics will not only explore these questions in a systematic manner, but also engage with some of the most pressing problems in society today. Students will have the opportunity to develop familiarity with important ethical theories such as deontology, utilitarianism, virtue ethics and ethical relativism. They will be introduced to central philosophers such as Aristotle, Kant and Nietzsche and more modern writers such as Singer, Nussbaum and Neiman. Topics may include but are not limited to:

- Euthanasia, human experimentation and other issues in medical ethics.
- Terrorism, violence, equality and the limits of justice.
- Animal rights, sustainability, and eco-radicalism.
- Diversity and discrimination.

This course will provide students with an excellent introduction to the ethical dimension of many of the themes that they are studying at AUC: social systems, health and well-being, and energy, climate and sustainability.

### **900264ACC/HUM Modern Philosophical Texts**

*Credit points*            6 ecp

*Theme*                      n/a

*Track*                        n/a

### *Prerequisites*

Students are recommended to have completed at least two courses in their major.

### *Course description*

This intensive course will focus on Friedrich Nietzsche's (1844-1900) most famous book: *Thus Spoke Zarathustra: A Book for All and None* (1883-1885). *TSZ* is written in a fictional form, full of paradoxes and metaphors, much to the annoyance of Nietzsche's colleague philosophers, who feel this is not the way philosophical concepts should be expressed. *TSZ* consists of speeches on a lot of philosophical themes. Nietzsche himself called *TSZ* a '5<sup>th</sup> gospel'. In a biblical style ideas are presented that are fiercely critical of western (Platonic) philosophy and Christian morality.

In the course we will go through this bewildering, controversial text. We will address central themes, including, among others:

- The 'death of God' (proclaimed in the parable of the 'Madman' in *The Gay Science*, and referred to in the Prologue of *TSZ*)
- Stages of development: the 'overman'
- Teaching and learning
- Philosophy of time: the doctrine of eternal recurrence
- Friendship, compassion and 'love of neighbor': repudiation of Christian morality.
- Knowledge and truth: Zarathustra's/Nietzsche's 'perspectivism'
- Will to power

At the end of the course we will have a look at how Nietzsche's work has affected contemporary western thought. We will also consider Nietzsche's impact upon the Nazi ideology and ask ourselves to what extent this impact can be explained by or blamed on *TSZ*.

### **900265ACC/SCI/HUM Advanced Logic**

<i>Credit points</i>	6 ecp
<i>Theme</i>	n/a
<i>Track</i>	Mathematics (SCI)

### *Prerequisites*

Logic, Information Flow and Argumentation, 100-level course

### *Course description*

The aim of the 200-level advanced logic course is to provide the students with a deeper understanding of what logic is about. The course is a continuation of the introductory course 'Logic, Information flow and Argumentation'. As such, it maintains an interdisciplinary character and it draws connections with a variety of fields such as: philosophy of language, cognitive science, psychology of reasoning, mathematics, linguistics and natural language semantics, computer science, artificial intelligence, philosophy and history of logic.

We will expand on the logics covered in the introductory course, namely, classical propositional and predicate logic, as well as dynamic epistemic logic. We will also motivate and introduce new systems, prominent in one or more of the fields

mentioned above; for example, the students will be familiarised with intuitionistic logic, set theory, many-valued logics, tense logic, non-monotonic logic and game theory.

In each case the students will learn to work within the respective logical systems and use their expressive powers, while asking critical questions about these systems and investigating their applications to various fields. We will explore the difference between the model theoretic and the proof theoretic approaches to logic, as well as study some interesting axiomatisations. In a few cases, a number of meta-logical results will be proven, such as the completeness theorem for classical propositional logic. Special attention will be devoted to philosophical questions surrounding the technical results.

### **900266ACC/HUM Ancient Philosophical Texts**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>n/a</i>
<i>Track</i>	<i>Philosophy</i>

#### *Prerequisites*

100-level Logic, Information Flow and Argumentation

#### *Course description*

Socrates famously claimed that the “unexamined life is not worth living”. In this course we will read several ancient philosophical texts by Plato, Aristotle and Cicero, focusing on philosophical questions of metaphysics, epistemology, ethics, and politics. Students will acquire an understanding of how – for the ancients – answering questions about ethics or the good life, and about metaphysics and epistemology is a prerequisite for a healthy political system. All three philosophers start with a theory about the good life for human beings, and they challenge us to examine our own lives, views and opinions. Plato articulates his view of the good life in the first four books of the Republic. Aristotle expands on the ancient view of the good life in the Nicomachean Ethics, and Cicero gives the ancient Greek view a ‘Roman twist’ in On Duties. We will analyze the implications of the ancient view of the good life for politics by reading sections of Plato’s Republic and Plato’s Laws, Aristotle’s Politics and Cicero’s On the Commonwealth. We conclude the course with several articles discussing the relevance of ancient thought for ethical and political questions today.

### **900311ACC/HUM Creative Writing**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>n/a</i>
<i>Track</i>	<i>Literature (HUM)</i>

#### *Prerequisites*

Academic English I

#### *Course description*

Students explore the practice and theory of creative writing before embarking on fully-fledged exercises in prose. Students will develop their skills in writing poetry, fiction and creative non-fiction. Journals, free-writing, guided writing, structured exercises and revision strategies will make up the course. Students will be encouraged to submit samples of their work from rough drafts to the final

product. Students will also be encouraged to read in order to develop an eye and ear for form, tone, structure and style. At the end of the course students should have built up a portfolio of the different genres in creative writing. This course aims to further students' writing proficiency in English and familiarise them with techniques used in English prose writing and other genres.

**900321ACC/SSC    Advanced Research Methods and Statistics**

*Credit points*            6 *ecp*

*Theme*                    *n/a*

*Track*                     *n/a*

*Prerequisites*

BRMS; BRMS II is strongly recommended

*Course description*

In this course we will cover a series of techniques that go more into depth than those covered in BRMS and BRMS II. We will work extensively with data and learn how to analyze and interpret data at an advanced level. The course covers the following topics:

- recap multivariate linear regression and ANOVA
- complex regression models (e.g. mediated moderation) and MANOVA
- dealing with violated regression assumptions
- generalized linear models, i.e. regression models for categorical and limited dependent variables
- methods of data reduction and scaling (e.g. PCA, correspondence analysis)
- If time permits: introduction to structural equation modeling and multilevel analysis

Advanced Statistics will be an essential preparation for those who are planning to do a Master's program in one of the quantitative social sciences such as Psychology, Economics, Sociology, Political Science, or Health Science.

**900322ACC/SSC    Advanced Qualitative Research Methods**

*Credit points*            6 *ecp*

*Theme*                    *n/a*

*Track*                     *n/a*

*Prerequisites*

This course is limited to 300-level students

*Course description*

The course will build on the 200-level Qualitative Research Methods course. Central to the course is students' in-depth exploration of the topic of their intended Capstone research. They will use a grounded theory approach, where the research process takes the form of a dialogue between theoretical ideas and empirical findings. In the process, students will learn to make use of naturalistic research methods, such as qualitative interviews and ethnographic observations. Additional methods are the use of visual media, the analysis of literary (non) fiction, and analysis of social networks. Students will perform the first round of qualitative analysis, and based on their preliminary findings formulate new questions to be addressed in their Capstone research. The course will furthermore provide guidance in the craft of writing up qualitative research.

**900371ACC    Dutch B2.1**

**900372ACC    Dutch B2.2**

*Credit points*            6 *ecp*

*Theme*                    *n/a*

*Track*                     *n/a*

*Prerequisites*

Dutch B1.2

*Course description*

Students develop skills that enable them to handle a wide variety of communication tasks. This course also provides understanding of cultural aspects of the Netherlands.

Common European Framework of Reference for Languages levels B2.1 and B2.2  
(Upper Intermediate)

Course outcomes:

Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his or her field of specialisation.

Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either parties.

Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.

Students build on elements of vocabulary and syntax. Students learn the basics of academic writing and debate in Dutch and continue to learn about Dutch culture by reading short stories and one novel, as well as viewing and reporting on films and TV programmes.

**900373ACC French B2.1**

**900374ACC French B2.2**

*Credit points*                      6 *ecp*

*Theme*                                      *n/a*

*Track*                                        *n/a*

*Prerequisites*

French B1.2

*Course description*

Students develop skills that enable them to handle a wide variety of communication tasks. This course also provides understanding of cultural aspects of France and other French speaking countries.

Common European Framework of Reference for Languages levels B2.1 and B2.2  
(Upper Intermediate)

Course outcomes:

Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his or her field of specialisation.

Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either parties.

Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.

Students build on elements of vocabulary and syntax. Students learn the basics of academic writing and debate in French and continue to learn about French culture by reading short stories and one novel, as well as viewing and reporting on films and TV programmes.

**900375ACC German B2.1**

**900376ACC German B2.2**

*Credit points*                6 *ecp*

*Theme*                         *n/a*

*Track*                         *n/a*

*Prerequisites*

German B1.2

*Course description*

Students develop skills that enable them to handle a wide variety of communication tasks. This course also provides understanding of cultural aspects of Germany and other German speaking countries.

Common European Framework of Reference for Languages levels B2.1 and B2.2 (Upper Intermediate)

Course outcomes:

Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his or her field of specialisation.

Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either parties.

Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.

Students build on elements of vocabulary and syntax. Students learn the basics of academic writing and debate in German and continue to learn about German culture by reading short stories and one novel, as well as viewing and reporting on films and TV programmes.

**900377ACC Spanish B2.1**

**900378ACC Spanish B2.2**

*Credit points*                6 *ecp*

*Theme*                         *n/a*

*Track*                         *n/a*

*Prerequisites*

Spanish B1.2

*Course description*

Students develop skills that enable them to handle a wide variety of communication tasks. This course also provides understanding of cultural aspects of Spain and other Spanish speaking countries.

Common European Framework of Reference for Languages levels B2.1 and B2.2 (Upper Intermediate)



Course outcomes:

Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his or her field of specialisation.

Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either parties.

Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.

Students build on elements of vocabulary and syntax. Students learn the basics of academic writing and debate in Spain and continue to learn about Spanish culture by reading short stories and one novel, as well as viewing and reporting on films and TV programmes.

### **900339ACC Arabic III**

*Credit points*            6 *ecp*

*Theme*                      *n/a*

*Track*                        *n/a*

#### *Prerequisites*

Arabic II

#### *Course description*

In this course, students will gain a greater knowledge of complex grammatical structures and will increase their vocabulary. Students will continue to learn about the culture of the Arab world through short stories, newspaper articles and television programmes.

### **900341ACC/SSC/HUM Religion and Democracy**

*Credit points*            6 *ecp*

*Theme*                      *n/a*

*Track*                        *n/a*

#### *Prerequisites*

No pre-requisites for this course other than having successfully completed the first year.

#### *Course description*

Compared to the centuries when religion ruled supreme, modern democracy is a recent phenomenon. Once the transition to democracy had been made, however, religion found itself in an entirely new context. Religion and democracy are not natural allies. Religion is at home in hierarchical societies; religion endows the hierarchical order with legitimacy; in fact, religion embodies the very principle of hierarchy since it postulates an ultimate authority. The democratic order is flat. Rulers have the mandate of the voters instead of a mandate by God. How does religion survive in the environment of the modern democracy? This course looks at the new faces of religion in India, Turkey, France, and the US. Different democracies and different religions. But the processes of religious change, triggered by the dynamics of democracy, show striking similarities between different religions in different contexts.

**900361ACC/SCI/SSC/HUM      Moral Dilemmas in Medical Practice**

*Credit points*            6 *ecp*  
*Theme*                    *HW*  
*Track*                     *Health (SCI)*

*Prerequisites*

Students are required to have completed at least two 200-level courses in their major.

*Course description*

Medical practice is characterised by moral dilemmas. What should a physician do when a patient asks for active termination of life because of unbearable suffering? What should professional caregivers do when an elderly patient refuses a diagnostic procedure which might help to determine the cause of physical problems? What should a nurse do when a psychiatric patient might become dangerous to himself or others? What should a genetic counsellor do when a person does not want her family to know that she has a hereditary condition which may be relevant for her relatives?

In this course, these dilemmas will be studied from a theoretical perspective and investigated using methods for ethical case analysis.

Topics include:

- end of life decisions
- responsibility in elderly care
- coercion in psychiatry
- genetics.

The student will acquire knowledge of:

- theories on medical ethics
- moral dilemmas in health care
- methods of case analysis
- the practice of the ethical consultant

The student is able to:

- understand the significance of moral dilemmas in medical practice.
- place these dilemmas in a theoretical perspective and analyse them methodically (discussions, paper).
- interview a healthcare professional on ethical issues and analyse the transcript.

**900362ACC/SSC      Legal and Social Philosophy**

*Credit points*            6 *ecp*  
*Theme*                     *n/a*  
*Track*                     *Law (SSC)*

*Prerequisites*

*Law and Society, 100-level SSC course.*

*Course description*

This course offers a philosophical exploration of the use of law in society (legal ordering), from both a historical and a thematic perspective. Part I starts in classical philosophy: how did philosophers such as Plato and Aristotle conceive of law? Moving forward in time, the Roman conception of law will be discussed, and how this conception undergoes change in the work of influential medieval thinkers. As it represents such an important innovation, ample attention is paid to the positivisation of legal thinking in the nineteenth and twentieth century. The

main proponents of legal positivism are introduced, and their philosophical positions are analysed in light of actual legal ordering.

Part II engages in a multifaceted reflection on both the concept of law and the function of legal ordering in society. Firstly, theories that challenge the positivist account of law are addressed: the Critical Legal Studies movement, modern natural law theory and Ronald Dworkin's interpretation theory. Secondly, we shall explore ways to overcome the long lasting positivism/anti-positivism controversy: are there alternative ways to conceive of legal ordering? Thirdly and finally, the course presents a number of philosophical viewpoints with regard to the actual meaning and purpose of legal ordering for society and its members. Keywords: moral development, legal consciousness, narrative identity, citizenship and public deliberation.

## Description of courses in the Humanities

### **900111HUM            Theme Course I Introduction to Cities and Cultures**

<i>Credit points</i>	6 ecp
<i>Theme</i>	Cities & Cultures
<i>Track</i>	n/a

*Prerequisites*  
None

#### *Course description*

This course will offer an introduction to theoretical concepts and practices in the field of humanities by examining the complex connections between cultural and urban life. In the modern age, city life has increasingly come to shape our understanding of culture and social interaction, while the 'global village' of digital culture can be viewed both as an extension of this urban paradigm and as a potential way of breaking free of the alienation associated with modern cities. Examples and case studies will draw from a range of fields and media, including literature, film, comics, art history, and architecture,

Throughout the course, we will investigate and debate the relationship between cities and cultures: is cultural life the same thing as cosmopolitan life? Does being "cultured" also mean being "urban"? How have cities shaped our understanding of art, history, identity, and popular culture? And how do our media and artworks in turn shape our understanding of cities? How can a broad humanities perspective help us understand the complex relationship between cities and cultures?

The course will be structured by a series of key theoretical concepts that bring together our understanding of both cities and cultures, and which can help us formulate answers as well as introduce new questions:

- 1) History and narrative
- 2) Power and agency
- 3) Space and place
- 4) Industry and labor
- 5) Branding and image
- 6) Digitization and globalization
- 7) Power and resistance

Students will use a variety of methods and theoretical frameworks from the humanities. The joint disciplines of cultural theory and urban studies will occupy a central position throughout, and we will use a variety of case studies to introduce methods and practices from literary theory, film and television studies, gender studies and queer theory, human geography and popular geopolitics, art history, postcolonial theory, and globalization studies.

**900122HUM***Credit points**Theme**Track***Modernism and Postmodernism in Theory and Fiction***6 ecp**Cities & Cultures**Literature**Prerequisites*

None

*Course description*

In this course we will read some of the major texts that define literary modernism by authors such as Proust, James, Woolf, Joyce, Eliot, Pound, Hemingway, Hughes and Stein while being mindful of the historical, political and economic contexts in which they were written. Students will learn to identify formal and thematic features of typically modernist texts such as fragmentation and alienation and how these features were articulated in the criticism and print culture of the period. We will also be drawing on selected texts by authors such as Veblen, Benjamin, Lukacs, Simmel, Levi-Strauss and Todorov in examining these features in a theoretical light.

The course will then move on to address the paradigm shift to postmodernism through the work of authors such as Beckett, Pinter, Nabokov and Borges. This part of the course will be framed by a look at the work of theoreticians who have addressed or defined this shift, including Barthes, Foucault, Harvey, Lyotard, Baudrillard, and Jameson. We will then move on to consider postmodern fiction by authors such as Barth, Pynchon, DeLillo, Winterson, Burroughs, Ellis, Aker and Reed, and look more closely at ideas of 'reading postmodernism' in the work of McHale, Waugh, and Hutcheon.

Students will learn to identify the characteristics of literary modernism and postmodernism and their narrative representation, while discovering the deeper philosophical, cultural, and economic implications of this major paradigm shift. Students will also become acquainted with the basic tenets of theories that define modernism and postmodernism and a consideration of attendant issues such as modern and postmodern constructions of subjectivity.

**900131HUM***Credit points**Theme**Track***Film History***6 ecp**Cities & Cultures**Film**Prerequisites*

None

*Course description*

This course introduces students to both the concept and the phenomenon of Film History. Approaching the subject from various disciplines (philosophy, politics, aesthetics, science and technology, etc.), students will be required to confront a central question that will reappear throughout the semester, namely, "what is cinema?" Beginning with the prehistory of film in the 18<sup>th</sup> century (magic lantern shows, visual toys, etc.), the course will critically follow film's social, aesthetic, and technological developments up until the present day. In doing so, we will examine the close relationship between cinema and society, especially in relation to key historical events of the 20<sup>th</sup> century, such as WWI and WWII. Additionally, students will be asked to analyze the political and ideological uses of

documentary and narrative cinema, at various historical junctures, and in specific cultural contexts (national, postcolonial, queer, etc.). Special attention will be paid to concepts in film studies, such as the 'cinema of attractions,' the 'language of cinema', and 'auteur theory,' in addition to important film genres and aesthetic movements (German- expressionism, Italian neo-realism, *la Nouvelle Vague*, etc.). During the final weeks of the course, we will look at the current state and future of cinema, where digital modes of production and distribution, as well as participatory audiences, might be fundamentally transforming the very concept of film itself.

**900143HUM**                      **Periods and Genres: Early**

*Credit points*                      6 *ecp*  
*Theme*                                      *Cities & Cultures*  
*Track*                                        *Art History*

*Prerequisites*

None

*Course description*

This course introduces students to the study of art using examples that range from the earliest cave paintings through to the Middle Ages. It will emphasise visual literacy in a historical context and, by the end of the semester, students should be able to recognize and analyse the differences among the major periods, artists, genres, and theories of art. The course will also help students develop a familiarity with the art and broader cultural background of several non-western traditions. Students will develop the basic vocabulary for the formal analysis of art objects, and gain an understanding of the variety of social and historical contexts that have shaped artistic production in the periods discussed. Examples will include the visual arts of the Near East, Egypt, Greece, Ancient Rome, Byzantium, Islam, and northern Europe during the medieval period. *Periods and Genres: Early* will complement studies in philosophy, the classics, and religion, with a serious engagement in visual production of related fields.

*Periods and Genres: Early* is complemented by the second introductory art history course, *Periods and Genres: Modern*, and the combination provides a comprehensive overview of the field of art history. It is important to note, however, that both courses also function independently and it is not necessary to take both or to take them consecutively.

**900142HUM**                      **Periods & Genres: Modern**

*Credit points*                      6 *ecp*  
*Theme*                                      *Cities & Cultures*  
*Track*                                        *Art History*

*Prerequisites*

None

*Course description*

*Periods and Genres: Modern* is an introduction to art starting in the early Renaissance and continuing up to the present day. The course emphasizes visual literacy in a historical context. The material includes works of art and architecture drawn from a range of world cultures. By the end of the semester students should be able to recognize and analyse the differences among the major periods, artists, genres, and theories of art. The course will help students develop a

familiarity with the art and broader cultural background of several non-western traditions. Students will develop the basic vocabulary for the formal analysis of art objects, and gain an understanding of the variety of social and historical contexts that have shaped artistic production in the periods discussed. Examples will include the visual arts of Africa and Asia, the Renaissance in Italy and the Dutch Republic, the Baroque period in France, the advent of modernity in the 19<sup>th</sup> century, the 20<sup>th</sup>-century avant-gardes, and postmodernism.

*Periods and Genres: Modern* is complemented by the other introductory art history course, *Periods and Genres: Early*. The combination provides a comprehensive overview of the field of art history. It is important to note, however, that both courses also function independently and it is not necessary to take both or to take them consecutively.

**900151HUM**

**Communication**

*Credit points*

6 ecp

*Theme*

*Information, Communication, and Cognition*

*Track*

*Communication*

*Prerequisites*

None

*Course description*

This course is a broad survey of and introduction to the field of mass media and mass communication. Students will not only recognize the role of media in changing political, social and cultural dynamics on the local, regional, and global stage, but will also critique and analyze the variety of relationships between media and their audiences. Its main aim is to introduce students to the various dimensions of the media so that they can independently and competently consider and criticize mass media content and policy. It will focus on three primary elements:

1. Theories : How information is processed, perceived and communicated; how information impacts individuals and societies.
2. Medium: The history, structure, organization, distribution and control of individual media: print and electronic.
3. Influence: How media are consumed and how they impact society and its institutions

**900152HUM**

**Multimedia**

*Credit points*

6 ecp

*Theme*

*Information, Communication, and Cognition*

*Track*

*Communication*

*Prerequisites*

None

### *Course description*

In an environment saturated by multimedia this course will look at tools by which to become critical designers. We will look at how multimedia design is changing the world, demystifying the process, and learning how to become designers by making things. Starting from the assumption that everyone is a kind of expert in multimedia already, we'll work on developing critical tools and practical skills.

Each week will be divided between a short lecture and discussion of the readings and practical design training. Drawing from a broad spectrum, our readings and assignments will deal with: critical thought on multimedia, the history of multimedia in terms of cybernetics and the future of multimedia in terms of ubiquitous computing. Each week students will be expected to make a substantial contribution through their blogs and comments. These ideas will be used as inspiration for design ideas, presentations and longer form argumentation.

There will generally be two types of classes each week, a seminar and workshop. Seminars will begin with a presentation by the instructor on selected themes, followed by an in-depth discussion of the readings for which students are expected to prepare a list of points in order to participate in a discussion —active participation by students is required. Workshops will deal with the acquisition and development of practical design skills, for which students are not expected to have any background. Students will move at their own pace through online tutorials and progress will be graded accordingly. Skills acquired in the workshops will be used to reflect upon concepts discussed in the seminars. The specific outcome of project work can be relatively open to accommodate student's interests, so long as it addresses the overlap between "real" and "digital", and critically engages with those ideas discussed in the readings.

We will read texts in order to question assumptions about how things are, and how else they could be, as the inspiration for critical design projects. No prior digital design skills are required for this class. In fact students are encouraged to acquire new skills in this course. Over the duration of the course students are expected to develop their own skills in terms of design and critical thought, as well as work collaboratively.

In addition to the readings, the course will focus on practical design projects. These will explore topics related to the subject matter from the readings with both a written and visual component. Students will learn skills in-class, and as part of their homework assignments, which will be used towards this project. Both design and scholarship are integral to this work.

### **900161HUM**

*Credit points*

*Theme*

*Track*

### **Introduction to Literary and Cultural Theory**

*6 ecp*

*Cities & Cultures*

*Literature, if taken by non-HUM majors*

### *Prerequisites*

None

### *Course description*

This course introduces students to the history, theory, and practice of various methods of interpretation that are used across the Humanities disciplines for the study of literary texts and other artefacts. The schools and methods of interpretation that are covered in the course include: New Criticism, Russian formalism, (post-)structuralism, narratology, deconstruction, psychoanalysis,



feminism and gender studies, Marxist criticism, historicism and cultural studies, postcolonial theory, and reader response theory.

As the course progresses, you will become familiar with the main principles and ideas of each of those schools of interpretation, both through the first-hand study of some central theoretical texts and through the reflective development of your own interpretative skills and practices. Strategic use will be made of short stories and other primary texts, which will be discussed and analysed in class in order to illustrate, examine, and critically interrogate the theories and methods of interpretation under discussion. By the end of the course, you will be able to read literary and cultural theory independently, with a keen understanding of the different schools of thought feeding into it. You will be able to analyse primary literary texts in terms of their internal features and make-up, their social and cultural functions, and their ideological implications. And you will be able to express opinions and develop arguments about those texts and their role in society and culture that are informed by a critical and reflective use of interpretative principles and tools.

While the course places a significant emphasis on theoretical debates emerging from the field of literary studies, it also lays the foundations for your conversance with the more theoretical debates within film studies, visual studies, media theory, and other areas of Humanities scholarship.

**900162HUM**

*Credit points*

*Theme*

*Track*

**Standard Methods in Historical Analysis**

*6 ecp*

*Cities & Cultures*

*History*

*Prerequisites*

None

*Course description*

Can you blame the outbreak of the Great War on a single incident (the assassination of the Archduke Franz Ferdinand)? What can 164 diaries from Nazi-occupied The Netherlands reveal about the beliefs and intentions of the 9 million Dutch people who lived through the deportation of the Jews during that time? Why do people and societies continue to fiercely disagree about such events long passed? Why does history matter so much? And what does it take in our day and age to write a valid and compelling account of the past? Do you have what it takes to become the Edward Gibbon, Fernand Braudel or E.P. Thompson of our own time and completely transform the way we approach the study of the past? This and other stimulating issues will be taken up during this course.

You will not only better understand the evolution of History as an academic pursuit but also gain plenty of experience in working with different objects and documents from the past and applying theoretical perspectives that continue to shape the way we see history.

The first part of the course focuses on the raw materials that allow historians to formulate their accounts of the past – ranging from biographies, letters and administrative records to cartoons, maps and material culture. Which sources have captured their interest, why are these historical materials still around today and what are the specific challenges when using these documents?

The second part focuses on the methods used by historians to formulate their stories – ranging from the statistical analysis of slavery by Fogel to the literary

analysis of the French revolution by Darnton. Why were they able to reveal new truths about the past? Why was their handling of the sources so appreciated – as well as challenged – by fellow historians at the time? How far were they influenced by developments taking place in society at the time? And how were they able to influence contemporaries' mind-sets?

During the final part of the course you will apply the insights gained to formulate and conduct your own original research.

**900221/233HUM    Adaptation Studies**

*Credit points*

*6 ecp*

*Theme*

*Cities & Cultures*

*Track*

*Literature, Film*

*Prerequisites*

Introduction to Literary and Cultural Theory for Humanities majors

Any 100-level Humanities course for students from SSC or SCI majors.

*Course description*

Although the originality of a work of literature or art has often been privileged as the main criterion for evaluation, writers, playwrights, filmmakers and artists have always looked to previous works for inspiration. Adaptation, in other words, has always played a leading role within literature and culture as a primary mode of creative transfer and production. Arguably, globalization and advancing technologies have made (and are making) processes of adaptation increasingly complex, by increasing the scope and modes of reception and interaction across cultures and genres.

This class examines the theory and the practice of adaptation. We will consider adaptation as a cultural product (primarily from literature and film, but also including theatre, art, media, etc) and as a cultural process, in which an existing work is adapted to another medium or form, or to another context or culture. We do so from an interdisciplinary and international perspective.

In the introductory part of the course, we will explore possible frameworks for analysing adaptation. Students will be introduced to a) the main issues and debates involved in adaptation studies and b) some of the primary "tools" that have been proposed for the study of adaptations.

Throughout the course we will:

1. attempt to move beyond (i) the idea that adaptations and their 'source' texts represent a singular and one-directional line of influence from past to present; and (ii) the kind of comparative reviews that focus on 'good' originals and 'bad' adaptations;

2. interrogate the dialogue between multiple versions of a narrative 'pre-text' (i.e. our case studies): how and why do adaptations modify their sources in a particular way? How are stories adapted to particular aesthetic, commercial, social, or political demands – and are particular modes (e.g. film, novels, games...) more suited than others for these purposes? How do adaptations move across different cultures, genres, and time periods?

With the case study adaptations as our points of departure, we will consider different approaches to and theorisations of adaptation and examine various relevant notions, such as originality, fidelity, authenticity, universality, history,

myth, canon, and genre. Throughout the course, students will be asked to bring in their own examples of adaptations to discuss in class.

**900224HUM/SSC Political Shakespeare**

*Credit points*            6 *ecp*  
*Theme*                      *Cities & Cultures*  
*Track*                        *Literature*

*Prerequisites*

Introduction to Literary & Cultural Theory, or Big Books, or Standard Methods in Historical Analysis, or Classical and Modern Political Thought.

*Course description*

Shakespeare lived in times of turbulent cultural and political change. In this historical context, it is not surprising that Shakespeare's plays are saturated with political themes. In his 'history plays,' Roman plays, and tragedies we encounter a range of monarchs, statesmen, and citizens, who are depicted in situations that challenge their most deeply held beliefs and which often throw their identity as social and political actors into crisis. Taken together these plays constitute a profound inquiry into such issues as the divine right of kings, republican virtue and citizenship, the relationship between church and state, and the nature of the political life. What is more, the early-modern theatre in which Shakespeare was such a leading figure was itself deeply politicized as a social institution. The role of the theatre in early-modern urban culture, and in relation to the Elizabethan and Jacobean courts, makes for a vibrant cultural context in which each play is saturated with political meaning and resonance.

In this course, we will study the political dimensions of Shakespeare's work by bringing it into dialogue with insights from political theory, intellectual history, and comparative literature. We will address questions such as: How did Shakespeare think about kingship and statesmanship between ca. 1580 and 1620? By what kind of thinking about (civic) virtue and citizenship was his work informed? How did he respond to new historical, political, and intellectual developments in the course of his long career as a playwright? How do his plays *problematise* or *intervene* in the many political debates of the period – an important era of transition in which nothing seemed certain and everything was held up for debate? And, last but not least, are the dilemmas that confront Shakespeare's characters still relevant for readers today and, if so, how?

Plays to be read in this course may include: Shakespeare's Richard II, Henry IV (part 1), Henry V, Coriolanus, Antony & Cleopatra, Measure for Measure, Merchant of Venice, Othello, King Lear, The Tempest.

**900225HUM                      Literature and Science**  
*Credit points*            6 *ecp*  
*Theme*                      *Cities & Cultures, Social Systems*  
*Track*                        *Literature*

*Prerequisites*

Introduction to Literary and Cultural Theory for Humanities majors.  
Any 100-level Humanities course for students from SSC or SCI majors.

### *Course description*

This course will explore the relationships between scientific discovery and cultural imagination, production, and representation. We will consider the ways in which imaginative literature in particular, but also art cinema, and the media, addresses, responds to, and creates popular science, while also considering works of science which make use of literary strategies. Together, this collection of texts will encourage us to re-examine the relationships between scientific and literary communities in order to draw conclusions about the role of creativity in scientific discourse and the part literature has to play in reflecting critically on scientific developments in a range of historical and cultural contexts.

From Renaissance explorations of the relationship between science, magic, the imagination, to the emergence of 'science fiction' and evolutionary Darwinism in the nineteenth century, to the development of late-twentieth century cyberpunk and beyond, this course will analyse the treatment of such recurring themes as the 'mad' scientist, utopian and dystopian visions, intelligent machines and monsters, travel through time and space, science fantasy and prophesy, science and crime fiction, and science and the mind.

<b>900231HUM</b>	<b>The Cinematic City</b>
<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>Cities &amp; Cultures</i>
<i>Track</i>	<i>Film</i>

### *Prerequisites*

Introduction to Literary and Cultural Theory for Humanities majors.  
Any 100-level Humanities course for students from SSC or SCI majors.

### *Course description*

Twenty-two set films, cinematic representations of eighteen cities, eleven genres and five thematic foci form the cornerstones of Cinematic Cities. Between them, they provide the material which allows us to discuss both the roles urban settlements play in film, and the roles cinema plays for the cultural identity of a city. We shall be concentrating both on the 'what' and 'how' of cinematic representation, practicing formal analysis as well as interpretation enriched by theory. You will be able to acquire, hone and test your skills at scrutinising images, scenes, narrative patterns, sonic signs and cinematic techniques, ask questions about the viewing the diegetic and extra-diegetic visual scenarios (gaze, look, audience, cinema as space, film as medium) and explore movies as part of a larger discursive network which includes texts, images, sounds, histories, institutions and practices. As cities are social spaces, the filmic use of categories of diversity (class, gender, race, desire, religion, age, (dis)ability) will come under scrutiny. So will the philosophical foundations on which these categories rest, as we look at the representation of politics, love & desire, crime & pathology and poverty.

<b>900232HUM</b>	<b>Film and the Body</b>
<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>Cities &amp; Cultures</i>
<i>Track</i>	<i>Film</i>

### *Prerequisites*

Introduction to Literary and Cultural Theory for Humanities majors.

Any 100-level Humanities course for students from SSC or SCI majors.

*Course description*

The body is the focal point of cinema, whether as the implied but absent observer behind the camera, or as the fetishized object of the gaze. This course examines how film deals with various kinds of bodies—the female body, the pathological body, the macho body, the child’s body—and the relationship of these kinds of bodies to film genres such as horror, melodrama, comedy, film noir and heritage film. The course also examines how film represents various conceptualisations of bodies at key historical junctures, such as the plague-ridden early modern body in comedy; the pathological, mechanised body (i.e. Frankenstein) late in Enlightenment melodrama; the female body as fetish in film noir; the corseted female body in heritage film; or the surgically and prosthetically enhanced contemporary body in blockbuster adventure films.

<b>900233HUM</b>	<b>National Cinemas</b>
<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>Cities &amp; Cultures</i>
<i>Track</i>	<i>Film</i>

*Prerequisites*

Introduction to Literary and Cultural Theory for Humanities majors.  
Any 100-level Humanities course for students from SSC or SCI majors.

*Course description*

If a nation, like an individual, derives its identity in large part through the stories it tells about itself, then cinema is the medium par excellence to narrate those stories to mass audiences on a global scale. This course will study the cinema of a particular nation/region and its domestic and international reception, in order to examine its influence in shaping ideas about what it means to be, for instance, Cuban or Singaporean, Latin American or Southeast Asian. The focus of analysis will be those films considered landmarks of the nation’s/region’s cinema which helped to frame a sense of identity both at home and abroad. In cases where the cinema being studied is Non-Western, films made in the Western world about that nation/region will also be examined since in these cases, identity is often a process not only of defining oneself, but also of being defined.

<b>900243HUM</b>	<b>Urban Utopias</b>
<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>Cities &amp; Cultures</i>
<i>Track</i>	<i>Art History</i>

*Prerequisites*

Introduction to Literary and Cultural Theory for Humanities majors.  
Any 100-level Humanities course for students from SSC or SCI majors (Periods & Genres is recommended).

*Course description*

Assuming that a well-designed environment results in the social, political and economic advance of society at large, mankind has always looked for ways to improve his surroundings. The founding of new cities and the restructuring of

existing ones as a rule implies a desire for a new, better society. Architects and architectural theorists have thus shaped the way communities have lived, worked and interacted with one another.

Through recourse to architectural history and theory, anthropology, sociology, and philosophy, this course investigates a range of concepts and ideologies of planning and shaping urban environments. We will assess the conditions under which a variety of design visions were conceived, and view them in terms of the varying patterns of territorial orientation (local, regional, national, imperial, and global).

After a brief introduction in the history and theory of ideal cities and communities, we will focus on a number of key design concepts and theorists, from the royal palace and gardens of Versailles to the modernist ideas of Baron Haussmann (the renovation of 19th-century Paris), from the vision of Albert Speer and Adolf Hitler for Berlin and Linz, to modernist architects, such as Henri Le Corbusier and how his ideas were put into practice in various social housing projects, among them the Bijlmer in Amsterdam.

The course will also address the influence of non-permanent architecture, such as that of the World Exhibitions, on the planning of theme parks and shopping malls. Finally, we will also look at alternative utopias, such as the Amish communities in Pennsylvania, the Free City of Christiniana in Copenhagen and Ruigoord in Amsterdam Noord. Ultimately, students will be encouraged to think critically about future prospects of cities and visions that might reflect these new dynamics, such as the Urban Framework 2030 for Abu Dhabi.

<b>900244HUM</b>	<b>Art and the Body</b>
<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>Cities &amp; Cultures</i>
<i>Track</i>	<i>Art History</i>

*Prerequisites*

Introduction to Literary and Cultural Theory for Humanities majors.

Any 100-level Humanities course for students from SSC or SCI majors.

*Course description*

This course considers how visual images of the human body have been produced and perceived across times and cultures. Our point of departure in the course is that the human body may well be seen as the first "art object." From the earliest civilizations onwards, individuals have altered their bodies using tattoos, body paint, and other modifications (think of ritual mutilation, or the wearing of corsets and wigs) to underscore their individuality or identity, while also making clear that they belonged to a specific social or religious group. Consequently, cultures have attached great importance to the way that bodies are represented in painting or sculpture. The ancient Egyptians believed that the preservation of their mortal body was essential to their well-being in the afterlife. Some religions, such as Judaism or Islam, plainly prohibit the making of images of human bodies. And what to think of simulacra of bodies, such as the waxes on display at Madame Tussauds?

In this course, we will look at the ways in which bodies were constructed and disciplined in various historical periods, from primitive man to the ideal classical

Greek body; from the body of female martyr saints to the medieval monster; from that of King Louis XVI to Arnold Schwarzenegger. Using perspectives from a range of disciplines, we will look at functions and definitions of these and other bodies, their articulations in art, and their impact on visual culture. In doing so, we will work with critical terms such as embodiment and bodily materiality, and we will analyse artworks and their relationship with viewers in terms of performativity, spectatorship, ritual, gender, and race.

**900251HUM**

*Credit points*

*Theme*

*Track*

**Perspectives on Games**

*6 ecp*

*Information, Communication and Cognition*

*Communication*

*Prerequisites*

None

*Course description*

This course will examine video games from a number of critical perspectives, beginning with the issue of game playing subjectivity and how the subject at play has been, and continues to be, discursively constructed. The course will include an historical look at how digital games have developed from and alongside other games, such as card and board games, as well as how games came of age by remediating and being remediated by film and TV. The course will probe into the future, looking at developments such as group and clan formation in the field of online gaming, mobile gaming and pervasive gaming. Students will also be asked to analyse how war, gender, violence and ethnicity are represented in games, and further how these representations impact on subjective engagement. Finally, the question of subjective engagement in video games will be approached through theories of narrative and interactivity that address structural elements such as first and third person shooters, time manipulation and representation, open-endedness and linearity. While discussing a wide range of texts from different fields of study, students will also return to the question of how the interaction of technology, culture and the marketplace impact on our experience of games.

**900252HUM**

*Credit points*

*Theme*

*Track*

**Information Visualisation**

*6 ecp*

*Information, Communication and Cognition*

*Communication*

*Prerequisites*

None

*Course Description*

This course will focus on methods for visualizing large collections of multivariate data (numbers, symbols), textual data, and multimedia data (images, video) to reveal patterns and gain new insights into massive, dynamic, ambiguous, and sometimes conflicting data. Students will also learn to detect the expected and to discover the unexpected.

Students will learn how analytical reasoning is facilitated by interactive visual interfaces with diverse applications in science and business and how the results

are effectively communicated, by studying literature, by critically evaluating existing visualizations and by designing and developing their own models. Special emphasis will also be placed on techniques that are optimally geared towards the qualities and limitations of the human perceptual system.

**900253HUM**

**Narrative across Media**

*Credit points*

6 ecp

*Theme*

*Information, Communication and Cognition/Cities & Cultures*

*Track*

*Communication, Literature*

*Prerequisites*

Introduction to Literary and Cultural Theory for Humanities majors.

*Course description*

Telling stories is the most important activity by which human beings make sense of their lives. Narratology is therefore a crucial discipline not just within the humanities, but also one with important ramifications in disciplines beyond it. Many important concepts in the analysis of stories (e.g., narrative agency, focalisation, characterisation, temporal structuring) were first developed in literary studies, and proved to be adaptable to other media. However, as Marshall McLuhan famously emphasized some 50 years ago, "the medium is the message": the medium affects the form of a story, and thereby inevitably its contents.

In this course, which will alternate between lectures, seminars, and viewings, we will study narration in various media, including written fiction, film, comics, painting, poetry, and games, in order to assess whether, and if so how, central elements of narration are recruited for stories in different media. We will also pay some attention to how imposing narrative coherence on reality can have both beneficial effects (for instance in overcoming personal crises) and dangerous ones (for instance in economic theory).

**900261HUM**

**Introduction to Visual Methodologies**

*Credit points*

6 ecp

*Theme*

*Cities & Cultures*

*Track*

*Art History, or Communication (HUM) if taken by non-HUM majors*

*Prerequisites*

Introduction to Literary and Cultural Theory for Humanities majors

*Course description*

This course will offer an introduction to the range of methodologies that have been developed in order to analyse works of art and other visual media. Students will examine texts that address a variety of objects, including Renaissance altarpieces, seventeenth-century portraiture, photography, architecture, and contemporary film and video. The course will help develop students' skills in looking, researching, writing and argumentation. Topics to be addressed include formalism, semiotics, structuralism, post-structuralism, feminism and queer theory, visual culture, psychoanalysis, and post-colonial theory. By the end of the course, students should have an understanding of the pros and cons of various methodological approaches. Ultimately, this course will help students become



more aware of their own methodological choices as well as those of other researchers.

**900262HUM                      Early to Modern History**

*Credit points*                      6 ecp  
*Theme*                                      Cities & Cultures  
*Track*                                        History

*Prerequisites*

None though Standard Methods in Historical Analysis would be helpful

*Course description*

With complex and far-reaching developments like the Renaissance, the Reformation, the Scientific Revolution, the Agricultural Revolution, Tulipmania and the South Sea Bubble, the Commercial Revolution, the Transport Revolution, the development of the public sphere, and the political revolutions at the end of the eighteenth century, the early modern era (1450-1850) seems a period full of dramatic revolutions and crises. This course will study those moments of crisis, change and revolt, introducing the students to the major political, religious, economic, social and scientific developments in Europe. It encourages students to connect events and phenomena from the early modern period to recent developments. How, for instance, can we compare the 1720's South Sea Bubble to the recent financial crisis? Can we compare early modern interest in gossip and slander with modern blog practices? What revolutions are remembered, what revolutions forgotten?

Students will explore how ideas and practices concerning power, knowledge, truth, and beauty; material wealth and 'progress'; social morality and justice; cultural, national, and European identities; God and mankind; and everyday life shifted at different times. Students will develop their own critiques about these historical developments, and will also be actively encouraged to assess how the ideas and practices that developed in the early modern period are still used (and perhaps abused) today. The course will also incorporate visits to various cultural heritage institutions and places of cultural memory (like the Boerhaave Museum in Leiden, the Amsterdam Museum, or the Amsterdam Stock Exchange).

**900263HUM/SSC                      Addiction and the Modern Subject**

*Credit points*                      6 ecp  
*Theme*                                      Cities & Cultures  
*Track*                                        History

*Prerequisites*

None

*Course description*

Over the last centuries a *psychoactive revolution* has taken place in the world. A broad variety of psychoactive substances have become widely available via global commerce and the development of medicine, psychiatry and chemistry. Many of us are engaging – less or more - in altering our ordinary waking consciousness using alcohol, tranquilizers, antidepressants, or illegal 'drugs' like cocaine and cannabis. Meanwhile, increasingly the discourse on addiction has expanded to include behaviours such as shoplifting, internet addiction, eating disorders, obsessive consumption and the like that seems to belie the notion that any positivistic reliance on psychoactive substances existing in nature suffices to

grasp the phenomenon of addictive behaviour in all of its cultural and subjective complexities.

Taking a clue from this proliferation, this course will look into both the history and actuality of an increasingly urgent discussion starting in the early nineteenth century—one out of which the figure of the “addict” emerged—on the dangers of a wide range of forms addiction, from alcohol addiction to the subjective investment in artificial paradises and virtual realities, in order to grasp some of the most complex crucibles of the predicament we often designate as modernity. All along we will be exploring different views on the nature of addiction and its possible cultural constitution as a site where some of the most crucial stakes of what we call modernity, from the constitution of the modern subject and his or her desire to the kinds of political investments that go into the definition of what we hold as “normal” and what as “deviant” or “pathological” in the world we live in are urgently played out. Special attention will be given to the so-called “war on drugs” as a domain where all these issues may be productively explored.

**900264HUM/SSC World Religions: History and Politics**

*Credit points*

6 *ecp*

*Theme*

*Cities & Cultures, Social Systems*

*Track*

*History, Philosophy*

*Prerequisites*

Standard Methods in Historical Analysis recommended for Humanities majors.  
Classical & Modern Political Thought or Classical & Modern Sociological Thought  
Or Classical & Modern Anthropological Thought for SSC or SCI majors.

*Course description*

This course introduces students to the spectrum of world’s religions (drawing from shamanism and Shintoism, Confucianism and Islam, to Hinduism and Buddhism, Egyptian and Islam, Judaism and Christianity, African and Aztec), their historical transformations, some of their main issues and their interactions with politics. Certain issues will be combined with certain religions, thus shifting the focus each class. In order to cover the variety of religions, the different issues and the historical transformations worldwide, attention will be paid to

- theories on the origins of religion
- shamanism and mysticism
- ancestor worship
- polytheism
- monotheism
- monism
- religion & the Axial Age
- religion & the Modern Age
- religion & the state
- religion & conflict
- religious fundamentalism
- religion & nationalism
- religion & concepts of harmony
- religion & globalization
- religion & concepts of time.
- religion & identity

**900266HUM**

**Counterculture**

*Credit points*

6 *ecp*

*Theme*

*Cities & Cultures*

*Track*

*History, Culture*

*Prerequisites*

Introduction to Literary & Cultural Theory, or Big Books, or Standard Methods in Historical Analysis, or Classical & Modern Political Thought, or Classical & Modern Sociological Thought, or Classical & Modern Anthropological Thought.

*Course description*

This course investigates the counterculture of the period known as “The Long 1960s” by looking at the literature, film, music, and art of the period from a social and political history perspective. This turbulent era, which spans the Korean and Vietnam wars, and whose influence on contemporary is constantly being renewed and re-evaluated, is only now being considered in scholarly contexts, with the result that the following questions are only recently being asked and answered.

- Is this period best understood as a revolutionary, rupturing moment in history, or an evolutionary moment?
- What is the most effective theoretical model for collectively understanding the various liberation movements (national, gender, racial, sexual, ethnic, etc.) of the period?
- What is the relation between the political and the personal, between social movements based on individual identity and social change, during this era?
- What accounts for the rise and fall of non-violent protest during this period?
- How can we characterize the attractions of socialism during this era: as a temporary fashion or a genuine political and economic alternative?

<b>900311HUM</b>	<b>Theme course: The Global City and its Problems (Cities and Cultures)</b>
<i>Credit points</i>	6 ecp
<i>Theme</i>	Cities & Cultures
<i>Track</i>	n/a

*Prerequisites*

Introduction to Literary and Cultural Theory

*Course description*

This course studies the phenomenon of the “global city” in relation to the social, political, and aesthetic formations which characterise the current era of late-capitalist modernity. The course assumes throughout that received and established models for thinking about (post)modernity may have become inadequate for understanding the defining problems which affect – and constitute – the cultural life of global cities today. Special emphasis, therefore, will be placed on the challenges involved in re-conceptualising urbanism and the global city under present-day conditions. To this aim, the course will revisit inherited critical models for thinking about urbanism, modernity, and globalisation; it will bring them into dialogue with the reality and imaginary of global cities as articulated in contemporary media, literature, film, and visual art; and it will seek to challenge, update, and revise those models in the process. By the end of the course, students should have obtained a thorough acquaintance with state-of-the-art scholarship and critical theory on urbanism and modernity as an exciting, urgent, and highly interdisciplinary area of humanities research.

<b>900321HUM</b>	<b>Literature in the Age of Globalisation</b>
<i>Credit points</i>	6 ecp
<i>Theme</i>	<i>Cities &amp; Cultures</i>
<i>Track</i>	<i>Literature</i>

*Prerequisites*

Introduction to Literary and Cultural Theory and at least one 200-level course from the Literature track for Humanities majors.

Classical & Modern Sociological Thought or Classical & Modern Anthropological Thought, and at least one 200-level Social Systems course (preferably Community and Society in a Globalised World) for SSC or SCI majors.

*Course description*

Globalisation holds out many new challenges for thinking about literature and culture: the dynamics of cultural markets, the construction of cultural difference and cultural agency, and the ever-changing forms of cultural translation and transculturation which emerge under “globalising” conditions all invite us to rethink some of the most deeply held assumptions of literary scholarship today, leading to new conceptualisations of culture and literature in relation to politics and the social.

The principal aim of this course is to clarify the place and role of literary studies within the larger domain of globalisation scholarship, and to consider how the study of literature – both as a scholarly practice that is focused on literary case studies, and as a scholarly tradition with its own schools and legacy of critical thought – is integral to a better understanding of our global modernity. In so doing, the course builds on the 100-level course *Introduction to Literary and Cultural Theory* (ILCT), bringing your knowledge of some of the critical schools and theories which are covered in that course further up-to-date.

Case studies that will receive in-depth consideration over the course of the semester include: Goethe’s collection of poems *West-Eastern Divan*, *The Epic of Gilgamesh* and its 19th-century (re)discovery, Edward FitzGerald’s *Rubáiyát of Omar Khayyám*, the classic Chinese writer Lu Xun, Joseph Conrad’s *Heart of Darkness*, and David Mitchell’s novel *Cloud Atlas*.

<b>900322HUM/SSC</b>	<b>The Literature of Social Exclusion</b>
<i>Credit points</i>	6 ecp
<i>Theme</i>	<i>Cities &amp; Cultures/Social Systems</i>
<i>Track</i>	<i>Literature (HUM), Sociology (SSC)</i>

*Prerequisites*

Introduction to Literary and Cultural Theory and at least one 200-level course from the Literature track for Humanities majors;

Any 200-level Humanities course for SSC or SCI majors

*Course description*

This seminar explores literary engagements with the topic of social exclusion. In doing so, it draws on sociological and anthropological theories of globalization, transculturality, cosmopolitanism, social conflict and group membership. At the same time, close examination of literary texts uncovers that theoretical concepts sometimes fail to account for the intricacies of individual experience. The literary texts explored in this seminar portray diverse experiences of exclusion, stigmatization and discrimination but in some cases also of emancipation and

agency. The seminar engages with diverse areas of human experience such as diaspora and exile, war and political conflict, hierarchies of caste, class, race and gender, anti- and postcolonialism, new poverty and HIV/Aids. Literary texts, however, are not read as mere illustrations of 'real life' but also as aesthetic specimens in their own right. In addition to this, the seminar explores the aestheticization of social exclusion (for example in the stylized 'ghetto culture' prevalent in hip hop music) and its strategic uses in what Graham Huggan has called the "marketing of the margins".

**900331HUM**

*Credit points*

*Theme*

*Track*

**Film Auteurs**

*6 ecp*

*Cities & Cultures*

*Film*

*Prerequisites*

Introduction to Literary and Cultural Theory, Introduction to Visual Methodologies and at least one Film track course for Humanities majors .

Any 200-level Film track course for students from SSC or SCI majors

*Course description*

The 'auteur' is a key concept in film studies. Defining it, criticising it, defending it, dismissing it, re-inventing it, and criticising it *again*, without being able to get totally rid of it, has shaped film studies as a discipline. Originating in the era of silent film, the 'auteur' as a concept supported the distinction of 'film as avant-garde/art' vs. 'film as entertainment'. Decades later, during the 1950s, this debate flared up again in changed form, fuelled by the writing of French filmmakers and critics, who published their ideas in the *Cahiers du cinema*. During the 1960s, under the influence of structuralism, and then again in the wake of post-structuralism, it came under heavy attack.

This course combines a text-based element with a film-based one, which will start off side-by-side, but then part company (historically). We are going to look closely at the polemical debate around 'auteurism', at films by 'auteurs' and at the history of film studies. We will read and discuss the major articles which formed the debate on 'auteurism' in France, the UK and the US. We also contextualise the 'auteur' by looking closely at concepts such as 'genre', 'mise-en-scène', 'style' and 'signature'. Since controversy forms an important element of the debate, we also look at theoretical positions which consider 'auteurism' loaded with ideology, and want to explode or discard the concept of the 'author' altogether.

Part of the course will focus on film-makers who worked *inside* Hollywood's studio system, but *still* managed to get acknowledgment as film auteurs. Next, we move on to films which are considered auteurs' products in the strict sense of the word (in France, Germany, US). Having looked at independent directors, we then problematise the gendering of 'auteurism', by looking at film 'autrices', and, finally, turn to what might be called 'world'-auteurs.

<b>900332HUM</b>	<b>Film Philosophy</b>
<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>Cities &amp; Cultures</i>
<i>Track</i>	<i>Film, Philosophy</i>

*Prerequisites*

Introduction to Literary and Cultural Theory and Introduction to Visual Methodologies and at least one Film track course for Humanities majors.  
Any Film track course, or Philosophy for SSC or SCI majors .

*Course description*

Film is an object of philosophical reflection, but also a vehicle for and of reflection. Accordingly, this course takes a three-pronged approach to the study of film and philosophy. First, we will examine film theory, which can be regarded as a branch of philosophy (more, specifically, of aesthetics): core themes such as cinematic representation, spectatorship, interpretation and ideology will be addressed. Second, the discussion of these film theoretical topics will then be placed in a broader philosophical context through close readings of key philosophical texts, illustrated with the help of specific films (for example, the film-theoretical theme of cinematic realism will be viewed in light of the broader discussion of reality and representation in Plato's "Allegory of the Cave", and highlighted through the film *The Matrix*). Finally, the discussion of the relation between film and philosophy will lead to the question of whether (and if so, how) films can be judged to be philosophical in themselves. In other words, can films offer thoughts, reflections and arguments on their own? These questions will be posed in relation to 'philosophical films' such as *The Seventh Seal*, *8½*, *Der Himmel über Berlin*, *Funny Games*, *Dogville*, *Memento*, etcetera).

<b>900341HUM</b>	<b>The Art Market and Culture Industry</b>
<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>Cities &amp; Cultures</i>
<i>Track</i>	<i>Art History, Culture</i>

*Prerequisites*

Any 200-level Art History track course for Humanities majors.  
Any 200-level Humanities course for SSC or SCI majors.

*Course description*

Although the definition of what art is remains open, we can safely state that art works, their makers and public are part of society and its social, political, cultural, religious and economic networks. In this respect, the 19th-century concept of "Art for art's sake" may be unmasked as a typically western invention: it tells us perhaps more about the much-desired emancipation of "artists" from the whims of patrons, guilds and art academies, than about the art itself.

Drawing from a wide range of historical and present-day examples, this course will investigate relations between art, artists and the market. How has the profession of the artist and artistic education changed over the centuries? How can we define the relationship between artists and patrons, then and now? What is the institutional role of art academies, art dealers, museums and the government? Case studies will range from late medieval commissions of altarpieces to the rise of the art dealer in seventeenth-century Dutch cities, from the Salon in nineteenth-century Paris to the present-day phenomenon of art fairs and the branding of cities. Students will look at these processes with an

interdisciplinary approach, making use of art-historical, historical and sociological methodologies. They will work with key concepts such as low and high art, social distinction, cultural capital, the commodification of culture and cultural imperialism to capture the (changing) social significance given to art and the culture industry, and the relationships between art and the economy.

**900342HUM**

*Credit points*

*Theme*

*Track*

**Photograph as Socio-Political Document**

*6 ecp*

*Cities & Cultures/Information, Communication and Cognition*

*Art History, Culture, Anthropology*

*Prerequisites*

Introduction to Visual Methodologies for Humanities majors.

Introduction to Literary and Cultural Theory, or any 200-level Humanities course for SSC or SCI majors.

*Course description*

The photograph, as proof of what has been according to Roland Barthes, is inextricably tied to claims of truth. What some might view merely as an art object has had the power to change labor laws (photographs of children in factories), label people and objects (anthropologists and biologists utilization of photography), create national parks (photos from expeditions in the American west), garnered support for environmental activists (manipulated image of the earth taken from space), set off debates on abortion (image of fetus on the cover of Life magazine), send people to jail (photograph as evidence, most recently in apprehending suspects involved in riots in England), just to name a few examples. This course will examine the history of photographs as they have functioned in the scientist's laboratory, courtroom, and media. We will question the assumed veracity of the photograph and discuss how the photograph has been used as a tool in argumentation.

Methods will include visual analysis, which will help train students in various disciplines in the interpretation of images. We will look at texts from various fields in the sciences and social sciences and discuss photographs by thoroughly examining the social, historical and political contexts in which they were made. Since the focus is photography and representation, this course should be considered in the field of art history, however the well-rounded approach will appeal to students in political science, anthropology, sociology, law, and biology. Ultimately, we will address how images influence the creation of knowledge.

**900351HUM**

*Credit points*

*Theme*

*Track*

**Mediated Communication and Games**

*6 ecp*

*Information, Communication and Cognition*

*Communication*

*Prerequisites*

Any 100- or 200-level course in the Communication track, or the Introduction to Information, Communication, Cognition theme course.

*Course description*

Video games have become an integral part of global media culture that rivals Hollywood in cultural dominance. This class will consider this fact from the perspective of cultural studies and political economy through a number

of recent critical texts and in-depth class discussions. Students are thus expected to read all texts assigned and participate actively in the discussions. The course texts will help us consider how vast narratives and interactive experiences developed within the game industry are coming to impact both the marketing and entertainment fields. Rejecting either moral panic or glib enthusiasm, we will consider the profound impact of games on cultural, economic and political forces of global capital.

**900352HUM/SSC Media Psychology**

*Credit points*

*6 ecp*

*Theme*

*Information, Communication and Cognition*

*Track*

*Communication (HUM), Cognition (SSC)*

*Prerequisites*

Psychology and Communication

*Course description*

Media Psychology is an autonomous field of study within the science of psychology, but also a domain of intersection between two large knowledge fields, the one of psychology and the other of media studies. What does this intersection mean today, how is it pertinent, and what new directions are opening with the development of new and social media? This course aims at familiarizing students with the basic areas of interest for media psychology, enabling them to reflect upon the evolution of media-psychological debates through the field's history, and to critically engage with the contemporary psychological aspects and implications of media use. Among the topics that will be covered are: political communication, reality TV and mediated surveillance, branding and advertising, media representations of psychopathologies, individual responses to violence, and issues of cognition and perception in videogames and new media.

**900353HUM/SSC Journalism**

*Credit points*

*6 ecp*

*Theme*

*Information, Communication and Cognition*

*Track*

*Communication (HUM)*

*Prerequisites*

Introduction to Information, Communication and Cognition theme course, or Communication for Humanities majors; any 100- or 200-level course in the communication track for SSC and SCI majors.

*Course Description*

This course will introduce students to the mechanisms and dynamics of news writing and reporting. Students will learn techniques for identifying critical sources, recognizing good story angles as well as developing versatile interviewing and networking skills for a wide range of Amsterdam beats including sports, courts, the arts, lifestyle, travel, politics and business. Students will not only write hard and enterprising news stories for specific beats but they are expected to develop and critique ethical challenges in contemporary journalism.

Students are expected to investigate, generate, report and write news stories during class sessions. All stories will be broader historical, political, economic, social and cultural contexts, at local, regional and global levels. In this part



students will be made familiar with the various sub-disciplines within the field by means of field trips and guest lectures.

The third and final part of the course will concentrate on writing within the new media and on producing an actual digital newspaper. This will be presented in the form of a project, in which the students together produce a digital newspaper.

**900361HUM                      The History of Ideas: Power and Change**

*Credit points*

*6 ecp*

*Theme*

*Cities & Cultures*

*Track*

*History, Philosophy*

*Prerequisites*

Standard Methods in Historical Analysis or Early to Modern History are recommended for Humanities majors.

A 200-level course in the Sociology, or Political Science, or Anthropology track is recommended for SSC and SCI majors.

*Course description*

This course will familiarize students with major political, social and cultural developments in European thought from the Enlightenment till the present. It takes two core ideas – the nation and democracy – as the key concepts that will navigate us through the relatively peaceful 19<sup>th</sup>. century and the catastrophic 20<sup>th</sup> century. A focus on these two ideas is helpful because these twin-concepts are fundamental for all political and historical thinking from 1800 onwards: the simple fact is that they have developed into the sole ideas underpinning all forms of modern political legitimacy. Questions of inclusion and exclusion are central to both ideas.

The course covers both Western and Eastern Europe and students will be asked to analyse general developments and particular events, authors and conceptions in the history of ideas. Through studying the development of a variety of contested concepts of the nation and of democracy, as well as their practical consequences in terms of political action and everyday life, the students will acquire knowledge and insight in the political and historical condition of our 21st century.

In the first half of the course we will focus on ideas of nationhood in their relationship with ideas of ethnicity, religion, class and gender as they materialized in the works of historians. Starting from some general analyses of the nation and nationalism we will systematically chart how these different forms of collective identity have developed since around 1800 and how they were connected to each other, that is in which ways they interacted, overlapped or excluded each other. In this way the multi-layeredness of concepts of 'the nation' will be fleshed out, both in general terms and in specific cases.

In the second half of the course we will focus on contesting ideas of democracy, from the French Revolution onwards and especially in the 20<sup>th</sup> century. Because over this period democracy basically was (and still is) interpreted as the 'sovereignty' and the 'self-rule' of 'the nation', the notions of democracy and of nationhood are intertwined.

Departing from 18<sup>th</sup> and 19<sup>th</sup> century liberal understandings of democracy, we will follow the rise of 'mass democracy' in Europe and its problems – following Max Weber's classical diagnosis. We will then explore the consequences of World War One in the world of political ideas, in which the main competitors of the liberal idea of democracy originated. This will lead us to the rise of communist, rightist-

authoritarian and fascist ideas of democracy and nationhood, that became dominant in the 1920s and 1930s and that resulted in World War Two and in the Cold War. Due to its pivotal role in Europe's history Germany will occupy a special place in this course.

After the Cold War ended in 1990 we will land in 'the present'. We will deal with the present condition of political thinking, including the neoliberal attempt to present itself as an 'the end of politics' (and of history).

The course is mainly text-based but it also includes working with some filmic, visual and documentary source materials.

**900363HUM/SSC Religion and Violence**

*Credit points*

*6 ecp*

*Theme*

*Cities & Cultures, Social Systems*

*Track*

*History, Anthropology*

*Prerequisites*

The course is limited to third-year HUM or SSC majors.

*Course Description*

In recent years talk of the "return of religion" has become ubiquitous in everyday conversations, scholarly publications and conferences, and in the front pages of newspapers all over the globe. Mention of religion's newly gained public and political prominence frequently arises in connection with the eruption of violent conflict in trouble spots across the world, with religious convictions, practices and beliefs often identified by scholars and experts as the major source of most of the violence nowadays going on between and among individuals, groups, nations and even entire civilizations. This course investigates the current resurgence of religion against a theoretical background—Political Theology—for which, rather than recent, the relations between "Religion" and "Violence" have always been quite intimate and intrinsic. Indeed, for this perspective, religiously inflected forms of violence may be said to be at all times, not just today, the necessary underpinnings of both personal and collective identities; as such these forms are responsible for these identities' constitution, perpetuation and reformulation over time. After the first introductory weeks aimed at familiarizing students with the relevant theoretical literature, we will then examine a series of empirical instances—communalism in India, religious warfare in Southern Indonesia, the role of Evangelical fundamentalism in American politics, or, to mention one more instance, the appeal to mystical foundations and forces on the part of socio-political movements and criminal organizations such as drug cartels and gangs whose members often tattoo these mystical forces on their bodies —where "religion" and "violence" saliently come together with both powerfully constructive and deconstructive consequences.

**900364HUM***Credit points**Theme**Track***Cultural Memory Studies***6 ecp**Cities and Cultures**History/Culture**Prerequisites*

Introduction to Literary and Cultural Theory and at least 2 200-level courses in the Humanities programme.

Any two 200-level courses from the Sociology, or Political Science, or Anthropology track for SSC and SCI majors.

*Course Description*

This course offers an introduction to the international – and highly interdisciplinary – field of cultural memory studies. Through strategically chosen case studies, a number of fundamental questions will be explored about cultural memory in all its forms:

- What is the role of (collective) memories in society and culture? What forms of remembrance and commemoration can be seen to be at work in them? How do cultural memories contribute to the creation of social consensus, to the demarcation of conflicting identities and interests, and to the questioning of painful episodes from the past?

- What are the media through which cultural memories are circulated and maintained? What is the role of literature, film, and the visual arts in transmitting cultural memories? How do new media and new communication technologies impact on the material transmission of memories, both geographically (across countries and cultures) and historically (across generations or even centuries)?

- What explains the contemporary “memory boom”? Why are readers, museumgoers, and film and theatre audiences so obsessed with the past? And what is the role of the culture industry and the so-called “heritage business” in promoting, selecting, and defining cultural memories?

Cases studies may include: Holocaust narratives; narratives of trauma and testimony; urban memory sites; “world heritage” sites; art and history museums; commemorative spaces and practices. Key theorists and critics whose work will be considered in the course include: Aleida Assmann, Maurice Halbwachs, Andreas Huyssen, Pierre Nora, Ann Rigney, Michael Rothberg, and Jay Winter.

## **Description of Courses in the Social Sciences**

### **900003SSC Mass Violence: On Genocidal Regimes and their Killers**

*Credit points*            3 ecp  
*Theme*                      SS  
*Track*                        n/a

Master Class. Description will follow. This course will be 8 weeks long and there will be an application process to take the course.

### **900005SSC Master Class in Development**

*Credit points*            3 ecp  
*Theme*                      SS  
*Track*                        n/a

Master Class. Description will follow. This course will be 8 weeks long and there will be an application process to take the course.

### **900006SSC/SCI Master Class: Globalisation of Food Systems**

*Credit points*            6 ecp  
*Theme*                      n/a  
*Track*                        Environmental  
                                    Economics & Policy,  
                                    Health, Earth &  
                                    Environment

#### *Prerequisites*

This course is only open to second and third year students.

#### *Master Class Description*

Food is back on the agenda! Nobody feels neutral about food and agriculture now that food prices fluctuate wildly, fears about food safety abound, agriculture is seen as a great polluter, and urban classes increasingly choose local and biological products. Inevitably, food calls up strong feelings, old memories and strict convictions. It is a subject that is fraught with difficulties and confusion, technical, moral and political. For those who are poor, food is a worry, but for those who are well-off, it becomes a worry again. For food is not only nourishment, it is also status and identity. Yet most people, in most countries, and increasingly even in rural areas, are hardly aware of how food is really produced and how it lands on their plates.

In our modern world, food is always a product of a food system, a complex web of linkages between producers and consumer. In less than a generation self-sufficiency has disappeared nearly entirely and most urban people eat food that contains ingredients from other countries, often other continents. This will continue with further urbanization and future food demand. We still need to feed an additional two billion people in the next decades, while two billion more do not have enough to eat now and another two million will change their consumption patterns to include more animal proteins. This is technically possible, but it will require massive investment, sound government policy and dialogues between consumers, NGOs and food producers.

The course aims at providing an understanding of the complexity of the food chains at global, regional, national and local levels, to examine myths and confusions, hard data and projections. Personal and group assignments will

include country level studies as well as participant observation in supermarkets and discussions about corporate responsibility with farmers and the food industry. The course will be completed by a two-day simulation of a negotiation on increasing the sustainability of the food supply chain with all stakeholders, i.e. farm input industries (seed, chemicals), farmers, food processors, supermarkets, consumer organisations and local and national government agencies in the area of health, food, environment and economics.

### **900112SSC Theme course: Introduction to Social Systems (1)**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	n/a

*Prerequisites*  
None

#### *Course Description*

In this introductory theme course students will explore two fundamental questions of the social systems theme: 1) How are modern societies organized?; 2) And why? We will respond to these questions from the perspectives of law, political science, and economics. Students will be introduced to each respective discipline, emphasizing the specific ways in which it both frames these questions and responds. In addition to a basic introduction to the methodology and theory of each discipline, examples of current challenges and problems in society will be discussed, illustrating both the similarities and differences between the approaches. Examples of topics that may be covered include the social welfare state, anti-discrimination law, and international trade.

### **900113SSC Theme course: Introduction to Social Systems (2)**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	n/a

*Prerequisites*  
None

#### *Course Description*

In this introductory theme course students will explore two fundamental questions of the social systems theme: 1) How are modern societies organized?; 2) And why? We will respond to these questions from the perspectives of sociology and anthropology. Students will be introduced to each respective discipline, emphasizing the specific ways in which it both frames these questions and responds. In addition to a basic introduction to the methodology and theory of each discipline, examples of current challenges and problems in society will be discussed, illustrating both the similarities and differences between the approaches. Examples of topics that may be covered include the social welfare state, poverty and ecological disasters .

## **900122SSC Environmental Economics**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Env. Economics</i>

*Prerequisites*  
None

### *Course description*

The course offers a treatment of modern economic theories and methods to study the relationship between natural resources, environmental quality, economic structure, economic change, and environmental policy. The student is expected to develop a thorough understanding of relevant economic, environmental and ethical aspects, and of the link between theory, methods and empirical analysis. The approach will focus on setting the stage for the application of methods, such as modelling and valuation techniques. The following topics will be dealt with:

- biological and physical aspects of environmental processes and problems;
- environmental ethics and welfare economics;
- the economics of non-renewable and renewable resources;
- advanced topics in environmental policy theory (including instrument selection);
- theory and methods of monetary valuation of environmental change;
- models for the analysis of environmental policy;
- international environmental problems.

## **900131SSC Economic Thought in a Historical Perspective**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Economics</i>

*Prerequisites*  
None

### *Course Description*

This course presents an introduction to economic thought seen from a historical perspective. The rationale for taking this perspective is that economic theories did not develop in a vacuum. Indeed, economics was once named the science of political economy, to indicate the close connection between political interests and economic inquiry. The key to this course is the insight that economists of the past and present responded to the social and economic circumstances of their times. Moreover their answers were not unequivocal; similar problems called forth different solutions giving rise to competing paradigms and schools of thought. Studying the development of economics in its historical context is the best way to learn appreciate the richness of economics as a scientific tradition.

To this purpose, we shall discuss economic thinking from the days of the Greeks in classical Antiquity to modern times. This course aims to demonstrate how methods and tools emerged in their proper historical context and how they relate to economic policy. This requires an elementary introduction to some of the tools

of economics, which will be done in a non-technical manner. Applied economic questions relate to major issues in society, such as the issue whether economic science has a solid case in supporting either a free market society or active government involvement in economic problems. We also introduce the work of major thinkers in economics such as Adam Smith, Karl Marx, John Maynard Keynes and Milton Friedman, minds not always in agreement about the proper way to conduct economic research and policy, to say the least. The philosophy of this course is that tackling similar questions from different angles furthers understanding of what economics is all about.

### **900141SSC Law and Society**

*Credit points*            6 *ecp*  
*Theme*                      SS  
*Track*                        Law

*Prerequisites*  
None

#### *Course description*

This course introduces law as a human artifact that is used to establish order in society. This use of law - also called 'legal ordering' - will be addressed in three perspectives. In the first part of the course the essence of legal ordering will be studied by tracing its historical development. How did communities first start to use legal rules and concepts? Why is this often associated with the term 'formalisation'? What is the purpose of the ongoing attempt to codify and systemise legal rules in the form of written constitutions, statutes, treaties and regulations? Following Max Weber's sociology, it will be argued that the concept 'rationalisation' is crucial to understand all this. Law itself will be introduced in the second part of the course. A body of basic legal knowledge will be presented, answering questions such as: What is the basic structure of a modern legal system? What types of law do exist? How are lawyers supposed to find law? What is the basic structure of international law, and what are the specific features of the legal system of the European Union? Furthermore, students will be trained in a number of basic legal skills: consulting the sources of law, reading a judicial decision, interpreting legal rules and arguing to defend a legal claim. The third part of the course is devoted to critical reflection on present day legal ordering.

### **900151SCC Classical and Modern Political Thought**

*Credit points*            6 *ecp*  
*Theme*                      SS  
*Track*                        Political Science

*Prerequisites*  
None

#### *Course description*

The course introduces students to key texts in the history of political thought. It is divided into two main sections: classical and modern political thought. As part of the classical tradition we read Plato, Aristotle, Aquinas and Luther. Each philosopher starts out with the question about human nature and the good life for human beings. According to the classical tradition, the end of politics is not just to maintain order in society but also to cultivate habits that contribute to human flourishing. Good politics promotes and crucially depends on citizens and

statesmen of good character. Machiavelli radically breaks with the classical paradigm and redefines good character. In order to survive a statesman has to finesse the *evil* ways of politics. As part of the early modern tradition we also read Hobbes, who argues for state sovereignty, and Locke and Madison who argue for institutions to keep both citizens and the state in check. We then enter the nineteenth century to discuss the strengths and weaknesses of democracy, reading Tocqueville and Mill. The course concludes with developments in the late-modern period, with Nietzsche arguing for a deconstruction of bourgeois morality and the liberal order, and the contemporary theorist Charles Taylor who argues for higher modes of authenticity in light of current political challenges.

### **900161SSC International Relations Theory and Practice**

*Credit points*            6 *ecp*  
*Theme*                      SS  
*Track*                        *Int. Relations*

*Prerequisites*  
None

#### *Course description*

The purpose of this course is to introduce students to the main concepts and theories in the field of international relations. Students will get familiar with a wide range of concepts such as anarchy, conflict, cooperation, trade and globalization, while also exploring different issue-areas. The course material is divided into five parts: historical perspective, IR theory, international cooperation, international security and international political economy.

### **900171SSC Classical and Modern Sociological Thought**

*Credit points*            6 *ecp*  
*Theme*                      SS  
*Track*                        *Sociology*

*Prerequisites*  
None

#### *Course description*

In this course we investigate the implications of the processes of globalisation and individualisation for existing social institutions and relations (the welfare state, the nation state, the family, the school, the church, political party, the trade union) and what changes will occur or what new institutions or relationships will replace the old ones.

We begin with an overview of the field of sociology in terms of the processes of globalisation and individualisation, with special reference to the concepts of inequality, solidarity, identity and rationality. Then we present contemporary theorists, whose theories and research shed new light on these processes. We first discuss Bourdieu, the author of the book *Distinction*, on the changing aspects of inequality, the importance of cultural capital and social capital, and then Robert Putnam, the author of the book *Bowling Alone*, on solidarity, concerning the fear that we are witnessing the decline of community. We also discuss Anthony Giddens, the author of the book *Modernity and Self-identity*, on the problems of constructing a sense of self in a world characterised by globalisation and



individualisation. Finally, we discuss George Ritzer, the author of *The McDonaldization of Society*, on the new course that rationalising process has taken in contemporary society.

After that we turn to study the classical theories that were the sources of inspiration for these contemporary sociologists. Bourdieu's theory is seen as a critique of the model of Karl Marx, but also as a continuation of some elements in Marx's class-theory. Putnam is inspired by the questions that Emile Durkheim discussed around 1900, the questions concerning the structural cohesion in modern society and the apparently decreasing importance of central values that bind people together. Giddens has raised questions that were treated for the first time in the work of Georg Simmel: how do we develop a coherent sense of self in an atomising urban and secular social milieu. And Ritzer is a self-confessed admirer of Weber's theory of the rationalising processes in contemporary society. He thinks that the principles that Weber discerned can still be observed today, but they manifest themselves in other places (not only in the government bureaucracy, but also in the supermarket) and that they sometimes have taken new and unexpected forms.

The final part of the course will return to the central themes and discuss some empirical research that has been done on the questions of globalisation and individualisation, but this time enriched by our excursions in the fields of classical and modern sociological theory.

### **900181SSC Classical and Modern Anthropological Thought**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Anthropology</i>

*Prerequisites*  
None

#### *Course description*

This course is an introduction to the discipline of classical and modern anthropology, the study of human diversity. The course will provide a brief overview of the four sub-disciplines of anthropology, namely (1) social and cultural anthropology, (2) archaeological anthropology, (3) biological/physical anthropology, and (4) linguistic anthropology, before diving into the (member-wise) largest sub-discipline of social and cultural anthropology. Social and cultural anthropology, which studies the socio-cultural variation of human societies and groups (e.g., when it comes to constructions of marriage, family and kinship, gender, and ethnicity), will thus be the central focus of the course.

In this course, we will explore how anthropologists define the concept of "culture" and the student will be familiarized with key concepts (e.g., hegemony, ethnicity, rites of passage) that anthropologists use. We will cover essential debates and theories (e.g., cultural relativism and functionalism, respectively) that have shaped anthropology and those that still do play a role in anthropology today (e.g., the crisis of representation). We will read (excerpts of) classical anthropological texts that lay the foundation for contemporary anthropology (e.g., Malinowski) and we will read more recent work that illustrates which questions anthropologists ask about modern-day issues and how they try to gain in-depth knowledge. In this regard, we will also pay attention to applied anthropology (e.g., urban anthropology) and how anthropology can be of use for education, business, and governments.

**900191SSC/SCI/HUM      Theme course: Introduction to Information, Communication, Cognition**

*Credit points*            6 *ecp*  
*Theme*                    *ICC*  
*Track*                     *n/a*

*Prerequisites*  
None

*Course description*

Humans sense, act, think, feel, communicate, learn and evolve. We see these capabilities increasingly also in machines. This course aims to develop a first understanding of how humans and machines make sense of the natural environment from all the physical signals pouring into them. Information from the world around us will be related to the structure of our brain and basic cognitive tasks such as language, sensory perception, intelligent interaction, and action. In parallel, the course will introduce how machines can encode information, store it, reason with it and retrieve it later to guide behaviour. The course is particularly relevant for students interested in crossing the divide between (physical, life, social) sciences to cooperatively i) step up progress in cognitive information processing in both man and machine, and ii) develop new applications and technologies serving society. Topics covered include, information structure, pattern recognition and machine learning, man-machine interaction, collective intelligence, mediated communication, expression and emotion, memory, brain structure, neuronal processing, visual consciousness, social cognition

**900192SSC                    Psychology**

*Credit points*            6 *ecp*  
*Theme*                    *ICC*  
*Track*                     *Cognition*

*Prerequisites*  
None

*Course description*

In this introductory course students will become acquainted with the methods and theories that are key to the study of psychology, along with their development. The course begins with an introduction to the scientific methods and technologies that ground psychology as a discipline, such as observation, reaction time experiments and brain imaging. Students will also receive an introduction to the psychology of language and, consciousness, emotion and social behaviours.

*Topics*

- 1: Psychology and Scientific Thinking: A Framework for Everyday Life
- 2: Research Methods: Safeguards against Error
- 3: Biological Psychology: Bridging the Levels of Analysis
- 4: Sensation and Perception: How We Sense and Conceptualize the World
- 5: Consciousness: Expanding the Boundaries of Psychological Inquiry
- 6: Learning: How Nurture Changes Us
- 7: Memory: Constructing and Reconstructing Our Pasts
- 8: Language, Thinking, and Reasoning: Getting Inside Our Talking Heads
- 9: Intelligence and IQ Testing: Controversy and Consensus

- 10: Human Development: How and Why We Change
- 11: Emotion and Motivation: What Moves Us
- 13: Social Psychology: How Others Affect Us
- 14: Personality: Who We Are

**900193SSC                      Linguistics**

*Credit points*                      6 ecp  
*Theme*                                      ICC  
*Track*                                      Cognition

*Prerequisites*  
 None

*Course Description*

Linguistics is concerned with the study of language. Of particular importance will be the social sciences perspective on language. On the one hand, language will be approached as a cognitive system. We will explore how the natural sciences bear on the analysis of language ability and the extent of its basis in human biology. On the other hand, language will be approached as a tool used by individuals in society for communicative and cultural purposes. At the end of the course, students will know how to place language within human cognition and will understand how linguists are working towards a satisfying characterization of its properties.

**900222SSC/SCI Risk Management and Natural Hazards**

*Credit points*                      6 ecp  
*Theme*                                      SS, ECS  
*Track*                                      Env.      Economics,  
     Earth and Env.

*Prerequisites*  
 Environmental Economics OR Introduction to Environmental Science OR Theme Course: Energy, Climate and Sustainability

*Course Description*

"Devastating earth quake hits Haiti." "Hurricane Katrina causes the costliest disaster in the history of the United States." "Japan fears a nuclear disaster after reactor breach." Headlines that capture some of the major disasters that have struck our world in the past 5 years. Do you want to fight back? Are you prepared to take tough decisions about life and death under extreme time pressure? This course provides you with the skill set, knowledge and expertise to deal with these challenges.

You will become a multidisciplinary team of risk fighters - devising plans, policies and practices to manage real-life disasters, at all stages of its life-cycle. At the core of your strategies is effective sharing of spatial information. Following introductory sessions that include team building, lectures on the natural and social processes involved in disaster management and practicals that familiarise you with data collection and spatial methodologies, we will work systematically through each stage of the disaster life-cycle: Risk Reduction, Relief and Recovery, and Short- and Long-term Reconstruction

## **900225SSC Environmental Law and Policy**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	Env. Economics / Law

### *Prerequisites:*

None

### *Course Description:*

There are few issues that affect our daily lives and our future and that of the planet as profoundly and as visibly as trans-boundary environmental degradation. This course will explore the emergence and evolution of law, policy and governance approaches designed to address contemporary environmental challenges in a multi-level context, from local to global. We will examine how the special nature and framing of environmental 'problems' affects the way state and non-state actors, respectively and collaboratively, respond to the environmental challenges posed by our modern, globalized, Anthropocentric world.

Drawing on various fields of studies including law, policy, politics, international relations, environmental studies, economics, sociology, philosophy, and ethics, this course will provide students with knowledge and critical understanding of how society responds to environmental threats.

The course consists of five thematic parts:

Part 1) (De)constructing environmental problems: will start from the premise that environmental problems are not simply 'given', but rather socially constructed and framed on the basis of locally dominant worldviews, social values, economic interests, and philosophical and political rationales. Major topics include social construction and framing, world views and value paradigms, eco-philosophy and sociology, history of environmentalism, green political thought, North/South perspectives, consumerism (and other societal cause of environmental problems), etc.;

Part 2) The Nature of the Environment as a 'Policy Problem': will examine environmental problems are not merely biophysical in nature, but also have important political, economic, geographic, cultural and ethical dimensions, involving a myriad of values and interests that may conflict. Major topics include nature of environment as a public good; market failures; externalities; moral hazards; collective action; tragedy of the commons. Explores the need for public policies for environment, rather than market regulation or voluntary choices by individuals? Debates various approaches including sustainable development and ecological modernization;

Part 3) Policymaking for the Environment – history, present and future: introduces the basics of (environmental) law and policymaking, by looking at the multitude of actors, interests and institutions involved in environmental politics at the national and sub-national levels. Major topics include the steps in the policymaking process from initial agenda-setting to legislative action; the variety of instruments and administrative tools available for policy intervention, even under conditions of risk and uncertainty; issues of power, influence, and access, stakeholder consultation, public participation, etc.;

Part 4) European Union Environmental law and Policy: will examine how these theoretical frameworks and concepts take practical shape in the unique supranational polity of the European Union. Following a brief primer/refresher on the EU's institutional make-up and policymaking process, we will trace the

unlikely historical genesis and evolution of EU-level environmental policy from a mere by-product of economic integration to one of the most prolific areas of EU law. Using detailed case-studies in substantive environmental issues areas, key weak-points will be identified in the implementation and enforcement of EU environmental policy by and in the Member States;

Part 5) Global Environmental law and Policy: will shift the focus upwards to the global level and the international law and policy arena. Here we observe both the more traditional machinery of international treaty negotiations and world trade arbitration between sovereign states, as well as the emergence of a new type of global environmental governance, defined as the ways in which sovereign states and non-state actors (including intergovernmental organizations, civil-society NGOs, industry and business groups, scientists, etc.) coordinate their discrete and collective efforts to address transnational environmental issues in a globalized world. Major topics include Introduction to international relations/actors and sources of public international (environmental) law; international environmental principles, globalization and international trade, emergence of global environmental governance regimes, etc.

### **900226SSC The Sustainable City**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS, ECS
<i>Track</i>	Env. Economics

#### *Prerequisites*

Environmental Economics

#### *Course description*

Cities are increasingly becoming the key centres of economic activity. 90% of global production uses just 10% of available land, which largely consists of urban landscape in coastal areas. By 2050, over 70% of the total world population is expected to live in cities, implying that in a few decades from now the world urban population will be larger than the entire global population today. Energy-wise the world is already predominantly urban: cities account for 60–80% of global energy use. These developments give rise to a series of interesting and relevant questions. First, we need to understand the economics of cities. What explains the location of cities? Why do people and firms have an increasing tendency to concentrate in highly dense, expensive and vulnerable parts of the world? Second, we need to understand the extent to which urbanization is a sustainable form of organization of economic activities. To what extent is urban development associated with segregation, congestion, crime and negative environmental impacts? Future climate and energy sustainability challenges will need to be tackled primarily by action in urban settings. What can be done to mitigate the risks that climate change poses to the concentration of global production in coastal areas? How can we provide affordable, secure and clean energy to the fast growing number of urban people and firms?

### **900231SSC Fundamentals of Micro- and Macro-Economics**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS

Track

Economics

*Prerequisites*

Calculus for Economics OR Calculus

*Course description*

This course offers main theoretical concepts and policy applications in economics. Applying economic tools of analysis help the student gain an understanding of how (economic) decisions are being made at the micro level (firms, households, government), and what outcomes can be expected in the aggregate (fluctuations and growth in national income, employment and prices). Economics also offers a normative perspective that helps evaluating observed equilibrium outcomes and the consequences of policy choices.

In particular, we cover micro-topics in consumer choice, theory of the firm, industrial organization, market failure, and information economics. Macroeconomic aspects covered include models of economic growth and models of business cycles. The role of policy will be discussed throughout.

For organizational reasons, we split the course in two equal halves: part I (Fundamentals of Microeconomics) and part II (Fundamentals of Macroeconomics). The course straddles the introductory and intermediate levels and will in general prepare for applied courses in economics and social sciences and in particular for advanced courses in microeconomics and macroeconomics.

**900232SSC International Political Economy (IPE)**

*Credit points*

6 ecp

*Theme*

SS

*Track*

Int. Relations and  
Economics

*Prerequisites*

International Relations: Theory and Practice or Economic Thought in a Historical Perspective

*Course description*

This course introduces students to the basic concepts and ideas of the field of International Political Economy. The course emphasizes the theoretical foundations of global political economy by discussing the most critical theoretical perspectives: realism, liberalism and historical structuralism. In addition, students will get acquainted with important issues of the contemporary global economy, such as the origins of the modern trade and financial systems, patterns of distribution of wealth, problems of poverty and development, patterns of global production and the causes of recent financial and economic crises.

**900233SSC International Trade, Growth and Development**

*Credit points*

6 ecp

*Theme*

SS

*Track*

Economics

*Prerequisites*

None

### *Course description*

This course introduces students to the important contemporary debate on how globalization affects economic growth, development and inequality. Students will obtain a detailed knowledge of the main concepts and theories on international trade and economic growth, and will be able to apply this knowledge to real life cases. The course also looks critically at the main controversies associated with international trade, including child labour, inequality and labour standards. Furthermore, the course will analyse the concept of development, the prospects for developing countries under globalisation and different views on the pros and cons of integration in the world economy. Within this context, the course looks at international capital flows, the scale and effectiveness of international aid, international migration and foreign direct investment. Finally, the course will foster a critical knowledge and understanding of the empirical body of evidence from applied economic research on determinants of economic growth and development.

### **900241SSC Comparative Law**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Law</i>

### *Prerequisites*

Law and Society

### *Course description*

This course will provide students with a comparative look at the national legal systems of selected countries. Students will gain an understanding of a variety of legal practices, such as legal education, the judiciary, legal interpretation, and the private/public law distinction. Systematic similarities and differences in how states develop and enforce legal order within their borders will be highlighted, allowing students to respond to central, emerging questions in comparative law, such as whether national legal systems are currently converging or diverging in content and approach. The development of core legal competencies, such as legal reasoning, analytic thinking, and the ability to read and interpret legal procedure and case law, will be integral to the course.

## **990242SSC Human Rights Law and Politics**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Law,Political Science</i>

### *Prerequisites*

Law and Society OR Classical and Modern Political Thought

### *Course description*

This course will introduce students to many of the major human rights conventions and laws and the mechanisms for their implementation. Students will gain insight into not only the formal aspects of human rights, but also the political and social factors that shape and limit their use.

We begin with a thorough introduction to the normative basis of human rights theory, including the questions of whether human rights are truly universal and whether civil and political rights should be distinguished from economics, social and cultural rights. The remaining part of the course will focus on the legal implementation of human rights at both the national and international level, especially within the United Nations system. Case studies from organisations such as the European Court of Human Rights or UN CEDAW will be discussed, highlighting the crucial role of politics in the modern human rights regime.

## **900251SSC Comparative Democracy**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Political Science</i>

### *Prerequisites*

Classical and Modern Political Thought

### *Course description*

What is the state of democracy today? Is there anywhere a genuine democracy or has this term become devoid of meaning? Should we aspire that all societies be democratic? What do critics of democracy say, and are there alternatives to the dominant model of a liberal democracy? This course provides a comparative theoretical and empirical framework to enable students to answer these questions.

The course consists of four main clusters:

- Fundamentals of democracy: key concepts and debates concerning the public sphere, civil society, equality, rights, legitimacy, participation and inclusion.
- Variants of democracy: comparing procedural, deliberative, republican and presidential models of democracy as well as electoral systems.
- The dark side of democracy: democracy and dictatorship, ethnic conflict, genocide, colonialism, and apartheid.
- Democratization and democracy promotion: models of transitions to democracy through revolution, conflict resolution and military intervention.

The discussion of theories and concepts covered in this course will incorporate historical and contemporary case studies including Italy, Germany, the Soviet



Union, South Africa, Rwanda, the United States, UK, China, Latin America, and the Middle East.

### **900252SSC The Politics of Modernity**

*Credit points*            6 *ecp*  
*Theme*                      SS  
*Track*                        *Political Science*

#### *Prerequisites*

Classical and Modern Political Thought

#### *Course description*

The twentieth century is considered the century of profound political and moral crises, involving totalitarian violence on an unprecedented scale in Europe, the Soviet Union, and Asia. These events have had an impact not only on history but also on political theorizing. Preceding these events, philosophers such as Rousseau, Kant, Weber and Schmitt contributed to the development of the modern paradigm of politics. This discourse was interrupted by the events of the twentieth century, after which political theorizing took one of three turns. First, there is a group of thinkers that came to radically doubt and critique modernity and to argue for a return to the classical foundations of politics. Second, another group argues for the deconstruction of the modern paradigm and the development of *postmodern* theories of politics. Third, yet others continue within the modern tradition. The objective of this course is to understand the modern paradigm of politics by reading the original authors and to understand the different responses to the 'crisis of modernity' after the second World War. The course is an invitation to sharpen our own thinking about modernity and possible ways of dealing with its shortcomings. The course includes readings from Rousseau, Kant, Weber, Schmitt, Leo Strauss, Hannah Arendt, Benjamin Barber, Arendt Lijphart, James Kennedy, Jacques Derrida, and John Rawls.

### **900253SSC The Middle East Today**

*Credit points*            6 *ecp*  
*Theme*                      SS  
*Track*                        *Political Science*

#### *Prerequisites:*

Classical and Modern Political Thought

#### *Course Description:*

This course examines the dynamic of political and social transformations the region of the Middle East has undergone in recent times. Notorious for its exceptionalism, and subject to scientific research perpetuating stereotypes of backwardness and resistance to modernity, this course seeks to highlight the region's socio-political dynamism, diversity and complexity. Main themes covered in this course include Orientalism and Occidentalism, Islam and modernity, regimes and revolutionary movements, regional feminist perspectives and the Israeli-Palestinian conflict.

## **900262SSC European Integration**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	<i>International Relations and Political Science</i>

### *Prerequisites*

International Relations: Theory and Practice OR Classical and Modern Political Thought

### *Course description*

This course explores the historical, political, and economic dimensions of the integration of countries in the European Union. It offers an introduction to the historical development of European integration. It presents an overview of the key institutions and policies of the European Union. The history, institutions and policies of European integration serve as a backdrop, for developing an overview of the various existing theoretical perspectives on European Integration. The course has a special focus on the political implications of ongoing economic integration within the Union. In group research projects, students actively investigate the political responses to recent episodes of economic crisis in the EU in order to see what they tell us about our theories of integration and the future of the EU.

## **900263SSC Human Rights and Human Security**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	<i>International Relations</i>

### *Prerequisites*

International Relations: Theory and Practice

### *Course Description*

This course examines the contribution of international human rights regimes to the protection and promotion of human security within the international community. Topics covered may include: 1) the challenge that war, torture and terrorism pose to traditional human rights instruments, particularly those that emphasize civil and political rights; 2) the role of poverty and global inequality in defining what constitutes human security; 3) humanitarian and natural disasters, including emerging problems such as climate change.

## **900271SSC Comparative Modern Societies**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	Sociology

### *Prerequisites*

Classical and Modern Sociological Thought

### *Course description*

This course explores some of the key developments and debates in contemporary sociological theory. While surveying the major contributions by Bourdieu, Habermas, Foucault, Wallerstein, Bauman and other theorists, we will trace the continuing relevance of classical tradition and examine more recent contributions to understanding such phenomena as social inequality and power relations; identity politics and civil society; formal education and cultural consumption; nationalism and genocide; economic and cultural globalization and new configurations of modernity. Particular attention will be paid to the sociological theories that examine political, economic and cultural processes in historical and comparative perspectives, and in the context of the enduring and/or current transnational contacts, differences, and flows of commodities, ideas, and people. Another key concern of this course is the nature and social relevance of sociological knowledge, its key conceptual and real-life dilemmas.

Central concepts include:

- Theories of Modernity
- Postmodernity
- Globalisation
- Fordism and Post-Fordism
- World System Theory
- Critical Theory
- Identity Politics
- Feminism
- Field and Habitus
- Nationalism and Genocide
- Sociological Theory and Its Social Relevance

## **900273SSC Inequality and Poverty**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	Sociology

### *Prerequisites*

Any 100 level Social Sciences course in the Social Systems theme

### *Course description*

This course explores the sociological definitions, measurement, causes and consequences of inequality and poverty. It focuses primarily, though not uniquely, on inequality and poverty in Western developed countries. The course consists of four parts:

In the first part, we look at the meaning, measurement and foundations of inequality and poverty. After a short discussion of classic thinking about

(in)equality, we consider various foundations of inequality and poverty (gender, race, the labour market) and we discuss the probability of social mobility.

The second part focuses on how social policies affect inequality and poverty in Western developed societies. We discuss how social policies can reduce inequality and poverty, for example by providing minimum income protection or access to education. Yet social policies can also create new inequalities between insiders and outsiders of the labour market, between men and women, or between ethnicities.

The third part explores the causes and consequences of immigration in relation to inequality. Inequality and poverty are an important reason for which people migrate. Migrants may have better opportunities in their country of destination, but new situations of inequality emerge in the receiving country. Since migrant workers often send remittances home, international migration may improve welfare in the country of origin, yet at the same time international migration may result in a brain and care drain.

In the fourth part of the course we will explore the consequences of the 2008 global financial crisis. We will discuss topics that are selected and presented by the students. These topics can vary from how the crisis has contributed to new inequality and poverty in countries around the world to the political consequences of new inequalities. For example, we can discuss how the crisis increased poverty in Southern Europe, or how it inspired the Occupy Wall Street movement around the world.

### **900274SSC Sociology of the Other**

*Credit points*            6 ecp  
*Theme*                      SS  
*Track*                        Sociology

#### *Prerequisites*

Classical and Modern Sociological Thought

#### *Course description*

One of the classic subjects of sociology is the relationship between norm and exception or deviation. Entire fields of knowledge from medicine to psychiatry to criminology emerged from practices of identifying, studying and categorizing normative exceptions – the ill, the mentally disabled, the socially pathological to mention few examples. In this course practices of differentiation, and the desire to expel or contain otherness through scientific and governmental techniques are explored. Paying a tribute to philosophical writings on the concept of the Other, the course focuses on the disciplinary and discursive constructions of sexual, moral, social, medical, mental and political difference. Readings in relatively new social science fields such as queer studies and disability studies are also covered to introduce new perspectives on this classic theme.

### **900275SSC Nations, Nationalism and Modernity**

*Credit points*            6 ecp  
*Theme*                      SS  
*Track*                        Sociology

#### *Prerequisites*

Classical and Modern Sociological Thought

#### *Course description*

The course examines the nature of national identity and nationalism. We will first survey some of the most influential statements on the rise of nation-states and the making of nations in the modern world. Our focus will be on the conceptual debate between “constructivists” and “perennialists.” We will then proceed to

explore in more detail the interrelations between nationalism and citizenship, ethnicity and nationhood, as well as between class, religion, gender, sexuality and national identity in a historical and comparative perspective. Specific case studies will allow us to reexamine the drama of the Holocaust, the imperial legacies in post-colonial nation building, and the paradoxes of inclusion and exclusion in contemporary America and Europe. Finally, we will critically examine the prediction that humanity is about to enter the era of "the end of nationalism" and explore the sources of the continuing attraction of the idea of "nationhood."

### **900281SSC/HUM Community and Society in a Globalised World**

*Credit points*                6 ecp  
*Theme*                        SS, Cities and  
   Cultures  
*Track*                         Anthropology

#### *Prerequisites*

Classical and Modern Anthropological Thought

#### *Course description*

It is nowadays commonplace to argue that 'globalization' affects people's social lives. This argument is founded on the observation that social contact increasingly stretches beyond traditional community boundaries, dissolving old configurations while at the same time creating new ones. But how does this work in practice, and how do individual persons respond to the challenges that globalization presents them with? Key to the course is to equip students with approaches, (theoretical) ideas and skills to untangle the complexities of this. The course focuses on globalization from below, i.e. on local actors and their social practices. Hence the course is critical of 'grand' views stressing the universality and predictability of globalizing forces.

To unpack the complexities of people's social lives under globalization, the course explores particular linkages between the 'local' and the 'global'. In this exploration, a distinction is made between social, economic and cultural aspects of globalization. To make this more concrete, the course focuses on three broad themes: i) migration and transnational life, ii) global circulation of goods, iii) cultural globalization. During lectures, key ideas and thinkers in these themes are introduced, followed by empirical case studies wherein these are applied on particular actors, products and ideas. Central throughout is what this all means for common people, and how they respond to this in different ways.

### **900282SSC The Crisis of Political Representation in Latin America**

*Credit points*                6 ecp  
*Theme*                        SS  
*Track*                         Anthropology

#### *Prerequisites:*

Classical and Modern Anthropological Thought

#### *Course Description:*

Generally characterized as a crisis of political representation, in recent years the political systems of several Latin American nations—Venezuela, Perú, Ecuador, Bolivia, Nicaragua, and Argentina among others—have often reached the point of breakdown brought about by a series of intractable tensions, contradictions and events. Such a predicament often goes along with the resurgence of populist

movements and organizations formed around charismatic leaders parading as outsiders to the established political regimes, a widespread public mistrust vis-à-vis the existing political sphere, as well as insistent calls for the replacement of representative practices and institutions by so called direct democracy understood as the unmediated assertion by citizens in the here and now of their immediate interests, demands and desires.

This course will make use of insights developed within philosophy, media studies, political science, anthropology and cultural studies to investigate this crisis in its various momentous ramifications. With a view to assessing their viability and ethical, political and possible emancipatory significance, one concern throughout will be to explore the alternatives that are currently emerging in the area to representative democracy as we know it, from various sorts of leftwing and rightwing populisms to experiments in so called direct democracy. All along, events going on nowadays in Latin America will be compared with similar situations unfolding in other parts of the world, from Europe to Asia, Africa and the United States.

### **900291SSC                      Developmental Psychology**

*Credit points*                      6 ecp  
*Theme*                                      ICC  
*Track*                                      Cognition

*Prerequisites*  
Psychology

#### *Course description*

This course will provide students with an overview of current developments in Developmental Psychology. The student will have acquired a solid introductory knowledge base of the current state of Developmental Psychology as a science. Also, the student will understand and be able to critique the main developmental psychological theories. Also, the student will have acquired a basic understanding of the Ecological models of Human Development

Topics include:

- The Study of Development
- Nature/Nurture & Evolution
- Prenatal
- Infancy
- Early Childhood
- Middle Childhood
- Adolescence

### **900292SSC   Cognitive Psychology**

*Credit points*                      6 ecp  
*Theme*                                      ICC  
*Track*                                      Cognition

*Prerequisites*  
Psychology

#### *Course description*

This course is about the scientific study of cognition – the mental processes that are involved in perception, attention, memory, problem solving, reasoning, and decision making. Apart from outlining *what* we currently know about these topics and how they have led to particular theories about what is going on in our mind, strong emphasis will also be placed on *how* we have obtained this understanding. As part of this, the course will give ample opportunity to get hands-on experience with many classic and contemporary cognitive psychology experiments. Another important aspect of the course is to demonstrate and discuss practical connections between cognitive theory and everyday experience.

Main topics that will be discussed are:

- perception (e.g., subliminal perception, optic illusions, object/face recognition, bottom-up and top-down processing, agnosia)
- attention (e.g., vigilance, attention capture, early and late selection, automaticity, cueing)
- short term and working memory (e.g., limited capacity, interference, serial position effects, central executive, dual task performance)
- learning and remembering (e.g., depth of processing, effects of training, implicit learning, transfer appropriate processing, eye witness testimony, false memories, flashbulb memory)
- knowing (e.g., categorisation, semantic networks, knowledge representation, priming)
- language (e.g., understanding words and sentences, language production, bilingualism)
- problem solving (e.g., information processing approach, expertise, creativity)
- reasoning and decision making (deductive reasoning, heuristics, risk assessment, stereotypes)

### **900293SSC Cognition Lab**

*Credit points*            6 ecp  
*Theme*                      ICC  
*Track*                        Cognition

*Prerequisites*  
*Psychology*

#### *Course Description*

An applied introduction to central experimental problems in the study of cognition. Students will carry out research in a lab or field settings on topics to be determined by the instructor. Of particular interest will be problems related to learning and education, especially in children.

### **900294SSC Introduction to Psycholinguistics**

*Credit points*            6 ecp  
*Theme*                      ICC  
*Track*                        Cognition

*Prerequisites:*  
*Linguistics*

### *Course Description*

This course introduces how the human mind processes language, as well as the aims, issues and methods of psycholinguistic research. Topics include the empirical validation of linguistic theories, typology, cognitive aspects of language processing, language acquisition, aphasia, reaction time experiments, eye-tracking, ERP, fMRI, computational analyses. The cycle of theoretical and experimental work will be explained and students will practice designing and executing a small experiment.

### **900311SSC Theme course Globalisation: Global Economics**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	n/a

#### *Prerequisites:*

Any 100-level theme course (Fundamentals of Micro and Macro-Economics is highly recommended for this course as it will assume prior knowledge of economic tools and methods. Limited to third year students).

#### *Course Description*

In this course, globalisation as both an empirical phenomenon and explanatory theory will be discussed with special attention to the economic aspect. Students are expected to gain an in-depth understanding of the different effects of globalization at both the national and international level, drawing on research and theories from the seven disciplines of the Social Systems theme: anthropology, environmental economics and policy, economics, law, international relations, political science, and sociology.

Topics covered may include: economic institutions, financial regulation, emerging markets.

### **900312SSC Theme course Globalisation: Global Politics**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	n/a

#### *Prerequisites:*

Any 100-level theme course (limited to third year students).

#### *Course Description*

In this course, globalization as both an empirical phenomenon and explanatory theory will be discussed with special attention to the political aspect. Students are expected to gain an in-depth understanding of the different effects of globalization at both the national and international level, drawing on research and theories from the seven disciplines of the Social Systems theme: anthropology, environmental economics and policy, economics, law, international relations, political science, and sociology.

Topics covered may include: international and European institutions, peace and security, migration, justice, and human rights.



## **900314SSC Theme course Globalisation: Global Community**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	n/a

### *Prerequisites:*

Any 100-level theme course (limited to third year students).

### *Course Description*

It has become a truism that today's world is rapidly 'globalizing', i.e. that the webs of interdependencies between actors are quickly expanding across the globe and that they are becoming increasingly complex. This seems particularly true for economic/material aspects of globalization: think of multi-national companies and their central role in structuring worldwide trade, or how global retail networks have dramatically changed consumption practices (supermarkets/malls), or how international migration flows support transnational entrepreneurship. Key questions that anthropologists studying these phenomena address are: how do actors working under conditions of (economic) globalization make sense of their situation, how do they act on these cultural understandings, and how do they organize their everyday lives in a rapidly changing world (livelihoods)? This theme course equips students with essential conceptual and methodological tools to investigate such important questions in-depth. Particular attention will be given to common, non-elite actors, and how economic globalization structures their socio-cultural practices; the course thus focuses on how globalization is structured 'from below'. Hence the course is critical of 'grand' narratives stressing the universality and predictability of globalizing forces, instead showing how diversity and heterogeneity are key to economic globalization.

In more detail, the course will focus on three important approaches in the anthropological study of economic globalization.

Firstly, it will be considered how rationalization of production and trade have promoted the rise and spread of a global capitalism, and debates whether this has led to cultural homogenization. A high point of global capitalism are 'hyperspaces' such as shopping malls and supermarkets. It is thought that these plays a major role in the rise of middle-class identities, hence figuring in how people think about themselves and other people.

Secondly, it will be regarded how global capitalism creates new inequalities between actors: in global value chains, wealth in the global South is appropriated and concentrated in the hands of a global elite in Global cities. These new global inequalities have profound consequences on local interpretations of labour relations (notably pertaining to gender and kinship ties), which is explored by looking at new global exports from the South.

Thirdly, whereas the aforementioned approaches emphasize how cultural change results from/are shaped by external structural conditions of economic globalization, a major question remains to what extent cultural change is internal to the webs of interdependencies in which actors operate. In other words, to what extent does agency drive processes of cultural heterogenization (sometimes called 'creolization') which anthropologists noted in many parts of the world? This point is highlighted by looking at transnational migrants.

After completion of the course, students:

- will have gained an insight in the diversity and variety of cultural forms under economic globalization;
- will be familiar with key anthropological concepts and debates in (economic) globalization;
- can meaningfully discuss structure-based and actor-based models of globalization;
- can apply these ideas in a field research project;
- will have gained practical experience with research methods to study globalization (anthropological fieldwork).

### **900322SSC Global Environmental Governance**

<i>Credit points</i>	6 ecp
<i>Theme</i>	SS
<i>Track</i>	Env. Economics

#### *Prerequisites*

Any 200-level Social Sciences course in the Social Systems theme.

#### *Course Description*

This course critically examines the past, present and future of global environmental governance, evaluates the effectiveness of specific case study regimes, assesses needs and options for reform and future innovations. The course explores dimensions of key contemporary global environmental problems and how these are addressed in law and policy approaches at various levels ranging from the global scale down to the regional (European), national and even local contexts.

The first part of the course will provide an introduction to the burgeoning field of "global environmental governance", its history, key actors and tools. It will address questions such as: What makes certain environmental issues global? How is environment affected by globalization and trade? Do global problems require global solutions? What distinguishes collective action problems at national or regional level from the global level? How do we make global environmental policy, and how do we make it work? How are the actors and the machinery of global environmental 'governance' changing, and does this replace or compliment traditional international environmental law and policy? Other major themes include the emergence of global environmental law and policy responses (regimes); key concepts, principles, practices and theories; actors and intergovernmental organizations (esp. UN/UNEP); multilateral environmental treaties: negotiation, compliance, enforcement and effectiveness; emerging role of non-state agents/private actors (e.g. international organizations; certification bodies, business, NGOs, consumers, etc.); voluntary standards and market-based instruments for GEG; global trade and eco-protectionism, North/South dimension, treaty congestion and regime fragmentation, etc.

However, the main focus of this course will be on detailed case studies of key global environmental governance regimes, such as: climate change, geo-engineering, biodiversity, fisheries, forestry, air pollution, ozone layer depletion, sustainable development, biosafety and biotechnology/GMOs, food safety, toxic wastes and chemicals, nuclear energy, water pollution and water scarcity, human rights and environment, environmental citizenship and participation, global trade and environment, etc. The course will involve active and dynamic participation by students in researching and presenting case studies, and in weekly in-depth and

comparative discussions of various specific global environmental governance regimes.

Through both individual and team work, students will acquire and share valuable comparative perspectives by synthesizing and comparing their individual research of (sub)national, EU, and global level public policy actions and private governance initiatives. By analyzing the collective outcomes of all these in-depth multilevel environmental comparative case studies, we will draw conclusions about cross-cutting issues, common trends, lessons, failures and weaknesses, successes and strengths, and will consider future directions for global environmental governance.

### **900331SSC Advanced Micro-Economics**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Economics</i>

#### *Prerequisites:*

Fundamentals of Micro- and Macro-economics, Calculus or Calculus for Economics

#### *Course Description*

This course will develop students' understanding of the theory and methods of microeconomics. Theoretical topics covered include decision-making by firms in monopolistic and oligopolistic markets and the implications for public policy including competition law. In particular, we will discuss how a monopoly may price discriminate, what quality it will supply, and its role in upstream-downstream settings. With respect to oligopolies, we will cover different types of rivalry, (tacit) collusion, entry and exit, product differentiation, moral hazard, and adverse selection. In addition, you will be introduced to the theory of auctions. Methods discussed include game theory, experimental economics, and econometrics.

By the end of the course, the student will:

- be able to apply micro-economic tools to analyze decision-making by firms in monopolistic and oligopolistic markets;
- be able to evaluate public economic policy including competition law aimed at correcting markets failures in imperfectly competitive markets;
- have acquired basic knowledge about methods commonly used in micro-economic research including game theory, experimental economics, and econometrics.

### **900332SSC The Promotion and Regulation of the Economy**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Economics</i>

#### *Prerequisites:*

Fundamentals of Micro- and Macroeconomics

#### *Course Description*

This course studies public policy aimed at industries where the competitive forces fail to deliver efficient outcomes. In particular, the course focuses on sources of

market failure such as economies of scale, barriers to entry, collusion, abuse of dominant position and weak property rights.

After introducing the basic notion of market failure the course takes the student to a tour on public policies to alleviate its effects on consumer welfare. The course first covers key antitrust issues such as horizontal and vertical mergers, collusion and exclusionary practices such as predation, exclusive dealing, loyalty discounts, rebates, tying and bundling etc. Then, the course moves into the discussion of the process of deregulation, liberalization and re-regulation of traditionally monopolized industries such as electricity, natural gas and telecommunications. Issues such as access pricing to infrastructures and the role of uncertainty and forward contracts are studied. The course ends with the important topic of R&D, weak property rights and the role of patents and firm cooperation.

### **900333SSC Advanced Macro-Economics**

*Credit points*            6 ecp  
*Theme*                      SS  
*Track*                        Economics

#### *Prerequisites:*

Fundamentals of Micro- and Macro-economics, Calculus or Calculus for Economics

#### *Course Description*

This course is concerned with the main research questions of macroeconomics: What are the sources of economic growth? What policies promote growth? What causes business cycles? What are the effects of monetary and fiscal policy? Can these policies be used to fight recessions? If so, how should they be designed? Many of these questions were already examined in "Fundamentals of Micro-and Macroeconomics". Here we will study these questions at a more advanced level, with a stronger focus on the methods that state-of-the-art macroeconomic research uses to provide answers to these questions.

Students will have acquired a solid understanding of the methods and theories of modern macroeconomics, their strengths and limitations in relationship to other disciplines, and how they translate into policy advice offered by macroeconomics. Students will be in a position to critically evaluate what macroeconomics in its current state can (and cannot yet) contribute to solving some of the big economic problems facing society.

### **900334SSC Market Failures, Institutions and Economic policy**

*Credit points*            6 ecp  
*Theme*                      SS  
*Track*                        Economics

#### *Prerequisites:*

Fundamentals of Micro- and Macro-economics

#### *Course Description*

The course discusses the general micro-economic theory of market failures, essentially asymmetric information and limitations to the ability to commit to promises, and of the institutions to cope with these market failures, for example contract law, property rights, reputations, credit rating agencies, the state

monopoly of violence, democracy, and the constitution. Institutions emerge as an attempt to minimize transaction cost, or equivalently, to internalize externalities.

The course offers a detailed analysis of the basic forms of transaction cost: asymmetric information (bargaining, moral hazard, adverse selection) and commitment problems (commitment in time, commitment to community = free riding). We analyze when the market creates the necessary institutions itself (private law) and when political coordination is required (public law). A wide number of practical institutions are discussed, for example social security, cities, financial markets, principal agent problems in bureaucracies. The aim is to show that all these market failures and institutions to cope with them can be explained by a small number of mechanisms that show up time and again in different contexts. The course stresses the links of economics to sociology, law, history and political science, and to a lesser extent, to biology and psychology.

### **900341SSC International Law**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Law</i>

*Prerequisites:*  
Comparative Law

#### *Course Description*

This course will provide students with an introductory understanding of the role of public international law in international affairs. Each session will focus on an important aspect of the discipline and will reveal how and why international law affects world affairs in such a profound way. Discussions emphasize the importance of international law in history and in current international relations, by examining closely how international law is practiced in domestic and international courts and tribunals, international organizations and, importantly, national governments.

Among the questions addressed are: How are disputes between states settled and what mechanism does international law provide for their resolution? What are the sources of international law? Who is bound by it? How is it interpreted? When may a state apply its own laws extraterritorially? When and how may military force be used? What is the position of the individual in international law? The course will also examine key international legal institutions such as the International Court of Justice (ICJ), the World Trade Organization (WTO) and the International Criminal Court (ICC).

Classes will consist of interactive lectures – including guest lecturers – and students will be required to produce research papers, legal briefs and plead a case in a moot court competition.

### **900342/334SSC International Economic Law**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Law</i>

*Prerequisites:*  
Comparative Law

### *Course Description*

This course is designed to provide students with the fundamentals of international law and international relations concerning global economic affairs. The course is mainly structured around the Bretton Woods system (i.e. the IMF, the WTO and the World Bank), thus emphasizing the current legal framework within which these international organizations function. While IEL discipline comprises many fields, this course will provide an essential understanding of international monetary law, international trade law, investment law and global financial regulation. There will also be discussed the impact of the global economic crisis of 2007 on these particular institutions and, thus, potential reforms. Students successfully completing the course will have a comprehensive view of the functions and role of the most important international economic organizations and should be able to understand relevant principles and rules, and solve legal problems in the field of international economic relations.

## **900343SSC                      European Union Law**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Law</i>

### *Prerequisites*

Any 200 level Social Sciences course in the Social Systems Theme

### *Course Description*

A small number of European states decided to open their borders to each other and form a common market in 1957. The resulting organization has now grown to 27 states and is the world's largest economy and trading block. The EU is no longer only about creating a single market, but also actively legislates and takes other action to do with the environment, criminal law, security, foreign affairs, social policy, education and culture, and many other fields. To achieve its goals it has its own parliament, court, and bureaucracy.

The core of the EU's effectiveness lies in its law. As a result of a series of judgments over the years it has become accepted that this must be enforced by national courts, and must take precedence over national law. National parliaments and legislators are no longer supreme on their territory.

This makes the EU unique. It is not quite a state, but it is more than a mere international organization. It has autonomy and power over its Member States, who submit to its authority, but they in turn influence it via representation in its bodies and institutions. There is in substance a pooling of national sovereignty to create a new type of supranational body.

This creates many problems and raises many questions. There are simple legal questions about how it all works, but also questions about the democratic legitimacy of the EU, and its capacity to respond to the desires and values of its population. There are also questions about its role in the wider world, and the degree to which it should replace individual European states in international affairs.

This course will look at, among other issues, the following topics:

1. The origins and goals of the EU
2. The institutional structure of the EU

3. The 'democratic deficit'
4. The nature of EU law – direct effect and supremacy
5. Human rights and the EU
6. European citizenship
7. The internal market – free movement of persons, goods, services and capital
8. The competences of the EU and their control: subsidiarity and proportionality
9. The enforcement of EU law - judicial procedure, preliminary references, state liability
10. EU social policy and labour market policy
11. The EU and international affairs

**900349SSC                      Moot Court Lab**

*Credit points*                      6 ecp  
*Theme*                                      SS  
*Track*                                        Law

*Prerequisites*

Comparative Law. International Law is strongly recommended.

*Course Description*

This course lets the student take an intensive approach to developing and delivering an international legal argument before the International Court of Justice. Students will receive training and work on drafting a Memorial for their respective sides in a legal dispute, setting out a convincing argument on the basis of international legal sources. Participating students will also undergo intensive video-training to practice pleading before a panel of judges. At the end of the course, students will plead their case before a panel of judges which will consist of experts on international law from practice as well as academia.

**900351SSC                      Comparative Public Policy**

*Credit points*                      6 ecp  
*Theme*                                      SS  
*Track*                                        Political Science

*Prerequisites*

Any 200-level Social Systems course in the Social Systems theme.

*Course description*

Comparative Public Policy undertakes an exploration of public policies and programs within a comparative context and will be taught in three sections: The Policy Building Blocks, Traditional Policy Areas and Up-And-Coming Policy Areas. The course begins with an exploration of welfare state typologies, including a consideration of collective provision and which sector(s) – government, labor market, family and/or the volunteer sector – are generally held responsible for the provision of which services and/or programs in a given country. Following from this, students will reflect on policy change (e.g. restructuring versus retrenchment, path dependency), the effects of globalization on national policies, issue definition / policy language and how issues find their way onto the political agenda (i.e. the interplay of political systems, corporations, NGOs, activists and the media). Students will then consider both policy analysis / program evaluation and policy challenges, including unintended consequences and long versus short-term policy strategies and outcomes.

In the second section of the course, traditional policy areas (such as welfare, marriage, health, immigration and education) will be considered and explored. The final section of the Comparative Public Policy course will focus on up-and-coming policy areas, including ageing, urbanization, environmental policy, advances in the life sciences and terrorism. These policy areas will be discussed using a comparative perspective, focusing primarily on specific policies and programs in developed countries, and concepts and principles will be analyzed on both a national and a cross-national basis. A primary area of inquiry will be if and how countries can learn from each other about the success and failure of policy initiatives. Throughout the course, students will be encouraged to explore concepts that are fundamental to the study of policy, such as policy context, rights and responsibilities, redistribution among social classes and a consideration of those who benefit from or are hindered by specific policies and programs.

### **900352SSC European and International Institutions**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Political Science</i>

#### *Prerequisites:*

A 200 level course in the Social Systems theme (European Integration is highly recommended.)

#### *Course Description*

This interdisciplinary survey course will provide students with a comprehensive understanding of the formal organization, impact, and future of the major European and international institutions such as the EU and the UN, with a focus on the EU. Of particular interest will be the influence of these institutions on state relations.

The first part of the course looks at international institutions from the perspective of law and history. Here we focus on the emergence of the modern state and its position in international law, centred upon the notion of sovereignty. Against this background, which are the major intergovernmental and supranational institutions? How have they come into being? What is their legal position?

The second part of the course looks at international institutions from the perspective of social science. What are the most influential "isms" that serve as social science explanations for the emergence and operation of international institutions and European integration?

The third part of the course investigates the philosophical assumptions underpinning the arguments studied in the first parts. Drawing on both classic and more recent texts, students compare rival understandings of social science and of sovereignty and examine the consequences of these views for our judgment of the major European and international institutions.

The final part of the course looks at the future. Combining the perspectives of law and history with those of social science and (political) philosophy, how do we expect the major European and international institutions to develop? Does globalization mean that we live in a post-national, post-democratic order? Should we approve or disapprove of such a development? Why?





Track International Relations

*Prerequisites*

Any 200 level course in International Relations

*Course description*

How do states pursue their interests in the complex and at times, challenging world? This course will allow students to explore the answer to this question. Focusing on applied problems, case studies will be used to illustrate both the practical and theoretical side of diplomacy, providing students with an in-depth understanding of how states achieve their goals.

**900371SSC Violence and Conflict**

*Credit points* 6 ecp  
*Theme* SS  
*Track* International Relations and Sociology

*Prerequisites*

Any 200-level course in either the International Relations or Sociology track

*Course description*

This course will provide an introduction into the field of conflict studies, investigating the escalation of non-violent conflict into mass-violence and exploring international responses to violent conflict. We will first look at the dynamics of inter-group conflict, focusing specifically on conflict between ethnic groups, including genocide. We will then move to the analysis of militarized conflicts, focusing mainly on intra-state (civil) wars. What motivates groups to pick up arms against a government? How do rebel groups organise and arm themselves? Why do some rebel groups manage to overthrow a government, while others collapse? How can we explain diverging patterns of violence in civil wars? Drawing on this analysis, international responses to violent conflict will be investigated, including humanitarian relief and peacekeeping. A recurring theme throughout the course will be the connections between processes of state-formation and violence, both in Western and non-Western settings.

**900372SSC Migration, Integration and Diversity**

*Credit points* 6 ecp  
*Theme* SS  
*Track* Sociology

*Prerequisites*

Any 200-level Social Sciences course in the Social Systems theme.

*Course description*

This course will expose students to the intersection of integration, diversity and migration taking place in different parts of the world. Diverse theories such as assimilation, transnationalism, and multiculturalism will be analyzed and country case comparisons where each of these prevail be highlighted.

The course has a theoretical sociological component and a small practical research component. Students will be required to use the theories they have

learned to analyse the stories they collect from immigrants or diverse ethnic groups which they seek out on their own.

Students will focus on migration studies, identifying social and cultural interpretations. The lectures and student presentations will focus on theories on migration as well as analyses of specific migration cases, e.g. transnational migration, illegal migration and assimilation issues.

Students will learn how to conduct interviews to highlight a focus of their own interest and to identify a person, a group, or several members of a distinct generation to interview.

They will need to identify aspects of diversity, processes of integration, and migration in their lives and connect these two issues of nation-state control and citizenship and democracy.

### **900373SSC The Development of Social Policy**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Sociology</i>

#### *Prerequisites:*

Any 200-level Social Sciences course in the Social Systems theme

#### *Course Description*

The course will explore key influences, political, social, and historical on the development of both social policy in practice and Social Policy as an academic discipline. The development of Welfare States and social policy developments in a range of countries will be included, including the Netherlands. Of particular interest will be: the influence of ideologies in shaping the development of social policy approaches; perspectives on the development of Welfare State regimes; perspectives on the social policy making process; perspectives on the development of the current welfare mix in societies (public, private, voluntary, informal mixes); perspectives on the development of debates and approaches to universality and selectivity in service provision; the development of social policy in the wider contexts of the EU and Globalisation; the development of anti-poverty and social inclusion policies and programmes; the development of social policies for social groups and in response to equality based social movements, old and new risks (e.g. age, disability, gender, race, sexuality, faith); and critical perspectives on the development of social policy.

### **900381SSC/HUM Urban Anthropology Lab**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS, Cities and Cultures</i>
<i>Track</i>	<i>Anthropology</i>

#### *Prerequisites:*

Community and Society in a Globalised World

#### *Course Description*

The majority of today's world population lives permanently, or part of their lives, in cities. Cities continue to grow in number and in size: urbanization has reached unprecedented levels. Many scholars view cities as central building blocks of 'post-industrial' society; others link cities to discussions on 'modernity'. Yet again others view the growth of cities as emblematic of the expanding gap between North and South, East and West. But what does on-going urbanization mean for the lives of ordinary persons living in cities, and of those aspiring to do so? What are the problems and dilemma's characteristic of social life in the city?

This course addresses these questions by presenting a critical review of anthropological and sociological thinking and literature on cities, urban life and urbanization. The course focuses on experiential and organizational aspects of social life in the city, but it also explores how this is embedded in broader societal frames, including the countryside (urban-rural linkages), transnational migration networks, and globalising trade. By taking a comparative perspective (including examples from Western and so-called 'developing' countries), the course surveys the social and cultural diversity in perspectives and practices of city dwellers/urban actors, and discusses different research approaches and traditions to study these meaningfully.

During the course, students gain insight into and develop an understanding of:

- Diversity and variety of city life in a comparative perspective,
- Today's social problems and issues associated with cities,
- The embedding of cities in broader socio-economic and cultural frames,
- Research methods to study city life (fieldwork).

### **900382SSC/SCI    Medical Anthropology**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>SS</i>
<i>Track</i>	<i>Anthropology, Health</i>

#### *Prerequisites:*

Classical and Modern Anthropological Thought OR Health and Well-being Theme Course.

#### *Course Description*

This course is an introduction to the growing field of medical anthropology. Medical anthropology has been recognized as an essential part of many international aid programmes and health promotion strategies. At a time of major global health problems – such as AIDS, tuberculosis, malaria and malnutrition, as well as the social problems linked to poverty, urbanization and overpopulation – a global, cross-cultural perspective is increasingly necessary. Students learn what role medical anthropology can play in understanding health problems in a variety of cultural settings, and how to prevent and deal with them.

Topics discussed may include the development and history of the central theories in medical anthropology, the social and cultural construction of illness and disease, the body, medical institutions and healthcare, pain, and stress. Students will learn advanced topics on various schools of qualitative and participatory research, linking research with interventions and advocacy.

### **900389SSC/SCI    Urban Environment Lab**

*Credit points*            6 ecp  
*Theme*                      SS, ECS  
*Track*                        Env. Economics

*Prerequisites:*

Introduction to Environmental Sciences OR System Earth OR Hydrology and Watershed Management OR Environmental Economics OR Fundamentals of Micro- and Macro Economics OR International Trade, Growth and Development.

*Course Description*

This course focuses on the science and social science of urban environment planning. An evidence based approach to the problem of climate change and spatial planning will be the focus of this year's lab.

**900391SSC/HUM/SCI    Theme    course:    Games    and    Learning  
(Information, Communication, Cognition)**

*Credit points*            6 ecp  
*Theme*                      ICC  
*Track*                        n/a

*Credit points*  
6 ecp

*Prerequisites:*

Any 100-level theme course (limited to third year students).

*Course Description*

This course will focus on what we can learn from psychology and social interaction research to inform the design of games and agent behaviours in games. Topics covered will include:

- Theories of learning and instruction
- The role of games in education
- Different types of educational games
- Design of educational games
- Research and evaluation of educational games

Students will evaluate behaviours that emerge in gaming and playful environments, and come to understand what factors influence this behaviour. Students will also have the opportunity to design a game, offering them the opportunity to evaluate theories in practice.

**900393SSC/SCI    Brain and Mind (for SSC students)**

*Credit points*            6 ecp  
*Theme*                      ICC, HW  
*Track*                        Cognition, Health

*Prerequisites*

Cognitive Psychology (Please note that students may only enrol in either one of Brain and Mind or Brain and Cognition.)

### *Course description*

The goal of this course is to deepen understanding of the neurobiology of the mind and the aetiology of mental disorders. Students will be encouraged to critically analyse the impact of neurobiology and (psychiatric) brain disorders on society.

To most of us, the mind constitutes as the very essence of our identity. However, where to draw the line between normal and abnormal, well and ill, an eccentric personality and a schizotypic one, an active, creative fast-thinking personality and ADHD?

This course will explore the neurobiology of the mind. First, students will be provided with a concise overview of the structure and function of the human brain and will be introduced to the basics of neural communication (electrical signalling and synaptic transmission). Next, the focus will be on key concepts in cognitive neuroscience such as perception, memory, attention, emotion and consciousness. A selection of relevant topics will be covered in depth (partly by students' presentations); possibilities include: altered states of consciousness, neurobiology of attraction and partner selection, creativity and mental illness, the gendered brain, the moral brain, free will, empathy and mirror neurons, cultural context of mental illness, intelligence, neurobiology of belief, superstition and religion, neuro-economics & neuro-marketing, brain-machine interfaces, cognitive enhancers, mind control (this list is by no means exhaustive).

An important focus of this course is the aetiology of mental disorders, such as ADHD, depression, addiction, autism and schizophrenia, with special attention for the nature-nurture discussion. Students will be challenged to critically reflect on the boundaries between normality and abnormality and the implications for society.

## **900394SSC Perception and Attention**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>ICC</i>
<i>Track</i>	<i>Cognition</i>

### *Prerequisite*

Cognitive Psychology

### *Course description*

This course introduces you to the problems of perception and attention. Why is perception a problem? Seemingly without effort, our brain constructs a rich world of visual, auditory, and other sensory impressions for us. But how are these mental impressions created? How do they relate to the physical world out there? In what ways can we study this subjective experience? And what happens when perception goes wrong?

Furthermore, from this rich world entering our senses, we only appear to be conscious of a small part at any one time. What do we attend to and what do we ignore? How does the brain make this selection? Can we do multiple things at the same time? Is attention the same as awareness or not?

This course teaches you to the scientific way of looking at perception and attention. We start with visual perception, from how the eye works to how brain damage changes perception. We treat questions such as, how does the brain recognize objects? How do we see color, or motion? Can we see without

consciousness? And are illusions trying to tell us that something is wrong in our brain? Another part deals with auditory perception. How do you know whether sounds come from above or below, because they enter through the same ears, right? How do you know who is talking, and what they are saying? Are there any auditory illusions? And does what we see affect what we hear? You will learn about the scientific methods and theories that have tried to answer these questions, as well as the relationship to everyday experience.

The second part focuses on attention. Attention appears to be driven in two ways: By salient stimuli (like ambulances), and internally, by "ourselves". What does "ourselves" mean here? Our free will, our previous experiences, our memories? What happens when attention goes wrong, like in spatial hemineglect? This part teaches you about the major theories of attention, as well as the behavioural and neuroscientific methods to investigate it.

## **Description of Courses in the Sciences**

### **900111SCI Theme course: Introduction to Life, Evolution, Universe**

*Credit points*                      6 *ecp*

*Theme*                                      *LEU*

*Track*                                        *n/a*

#### *Prerequisites*

None

#### *Course description*

This course covers all of the Natural Sciences and it revolves around a central science concept that runs through all the natural sciences: evolution. This concept can be approached from various disciplines emphasizing their interconnections. The student will gain knowledge about the evolution of the universe, the evolution of life and the evolution of complex biological systems and networks as well as the quantitative and mathematical modelling of complex systems.

Four subjects have been selected for this course:

The Big Bang – setting the stage for the emergence of life

- The first light, the first 300.000 years. Inflation, nucleosynthesis, decoupling and the cosmic microwave background radiation.
- Formation of structure; different energy-matter components and the evolution of the universe. Large scale structure: galaxies and clusters of galaxies. The first stars, formation of heavy elements, planets and the solar system.

The Cambrian Explosion - the crucible of creation

- The first tantalizingly elusive traces of life
- Emergence of prokaryotic/eukaryotic cells (and sex), emergence of multicellular life.
- The Cambrian explosion; (hard) body part formation,
- Evolution of flight, appearance of primates, early humans

What is life? – a systems biological approach

- The living cell, the smallest unit of life, but extreme complex
- How do we study/understand complex and dynamic networks of molecules which interact in time and space?
- Generic properties of biological networks
- Quantitative and predicting mathematical models for biological systems.
- the evolution of networks

### **900112SCI/SSC Theme course: Introduction to Health and Well-being**

*Credit points*                      6 *ecp*

*Theme*                                      *HW*

*Track*                                      *n/a*

*Prerequisites*

None

*Course Description*

Health and Well-being, both on an individual and societal level, is an important matter for our global society and human mankind in general. The introductory course focuses on a number of issues that are relevant to ongoing research in the disciplines of Biomedical Sciences and Health Sciences. The course provides the student with a powerful introduction to the major disciplines that shape today's thinking on health related issues. The emphasis lies on Medical Sciences that mould the Health and Well-being arena. The theme course offers a preview of biomedically oriented courses such as Metabolic Biochemistry, Medicinal Chemistry, The Human Body II, Hormones and Homeostasis, Immunology, Epidemiology, Nutrition and Health, Infectious Diseases, Cardiovascular Diseases, and Mechanisms of Disease.

The student is able to understand on an introductory and elementary level the following medical sciences

- general physiological concepts of regulation
- biochemistry and cell biology
- energy metabolism
- pharmacology
- pathology
- immunology
- genetics
- epidemiology
- hematology
- the alimentary system
- the internal environment, including topics of the cardiovascular system, the respiratory system, the renal system, and the endocrine system
- diet and nutrition

Furthermore, the student demonstrates competence in (oral) data presentation, analysis and interpretation, numeric, (medical) information retrieval and written communication



**900113SCI/SSC Theme course: Introduction to Energy, Climate and Sustainability**

*Credit points* 6 ecp  
*Theme* ECS  
*Track* n/a

*Prerequisites*  
None.

*Learning Outcomes*

The overall goal of this introductory course is a description of the fundamental challenge humanity is facing in the future, with emphasis on energy, climate and environmental and economic sustainability. It should also convince students that the inherent interlinking between these problems makes a systematic approach mandatory.

*Course Description*

This course elaborates the concept of sustainability. The carbon cycle and the Earth's energy balance are explained to understand our (changing) climate, and what measures are needed to limit global warming to a level that is considered acceptable. As 82% of the Dutch greenhouse gas emissions (218 Mt CO<sub>2</sub> equivalents) are caused by fossil fuel use, we focus on energy in this course. We discuss our energy demand, the difference between work, energy and power, frequently used energy units, and explain basic thermodynamics to understand why energy conversions are inherently inefficient.

We treat the following energy sources in detail: fossil fuels, nuclear energy, biomass, solar and wind energy. Following Mackay we go for numbers, not (only) adjectives. Hence, physical concepts and equations are introduced to describe energy conversions and to calculate their potential for a significant contribution to our energy demand. We discuss reserves, environmental impacts, strategic concerns, costs and benefits. In addition we take a close look at transport and heating (18 and 13% of the total greenhouse gas emissions in the Netherlands, respectively).

During this course, students will also do laboratory experiments (on photovoltaic cells, Stirling engines and wind turbines) and a computer simulation.

**900121SCI Introduction to Geological Sciences**

*Credit points* 6 ecp  
*Theme* ECS, LEU, HW, ICC  
*Track* Earth&Environment

*Prerequisites*  
None

*Course description*

Why do continental plates cruise around the globe, what causes ice ages or global warming, what was the impact of the origin of life on the planet, and what is sustainable management of natural resources, including energy and water? In order to answer these questions a basic understanding of Earth Sciences is essential. Students will understand the dimension of deep time in geologic processes ranging between seconds (earthquakes) and hundreds of million years (plate tectonics), including the basic principles of absolute and relative age determination. Students will be able to identify different rock types and minerals and be able to relate these to the dynamic processes in the Earth System.

This course will introduce the foundations of Earth Sciences i.e. the dimension of time in geological processes, the functioning of the major dynamic systems in the Earth as well as the role of Earth sciences in society and its relations to other disciplines.

Climate change, natural hazards and natural resources, including energy and water, are key issues in modern society. In this course, students will learn the basics of the Earth's dynamic systems, the climate system, the plate tectonic system and the geodynamo system.

In this course we explore the Earth as a dynamic system. The course consists of a series of lectures accompanied by a practical workshop. The lectures will focus on: plate tectonics; minerals, resources and rocks; volcanism and sedimentation; deformation and metamorphism; time in the geological record; the history of the Earth and the origin of life; the climate system and the hydrologic cycle; surface processes and deep processes; and the interaction between the dynamic Earth System and society. The practical rock determination workshop will focus on identifying minerals and rocks and exploring the geological record stored in them.

### **900131SCI Electrons, Waves and Relativity**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Physics

*Prerequisites*  
900122ACC Calculus

#### *Course description*

This course is an introduction to the basics of electricity and magnetism. In the first part of this course, we study the properties of the electric charge and field and see how this fundamental property of matter can be harnessed to build simple DC electrical circuits that are essential in so many technological applications. In the second part, we study the magnetic field without almost any consideration to the electric field. In the third part, we see how the electric and magnetic fields are intimately related to each other by the electromagnetic induction. Finally, in the fourth part, we revisit electrical circuits under alternative current. After this course, the student will be prepared to study electromagnetism, the subject that describes the nature of light and is at the heart of a tremendously important number of different technologies, like wireless and optical communications systems.

### **900132SCI Introduction to Physics – The Mechanical Universe**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Physics

*Prerequisites*  
None

#### *Course Description*

In this course, students are introduced to the main concepts and the mathematical formalism of classical mechanics as well as a number of their key applications.

Introduction to Physics provides a first encounter with central physical concepts such as space, time, conservation of energy, reference frames, gravity, and determinism. Particular emphasis is placed on the connection between deterministic quantities and random macroscopic phenomena. The course develops the principles of classical mechanics. Newton's laws will be discussed and their applications will cover phenomena such as resonance, earthquakes, and hurricanes. Kepler's laws of planetary motion and the phenomenon of Foucault pendulum precession will be derived. A number of other examples discussed include fluid dynamics, music, and sports. The course will include a self-contained review of the required mathematical background: vector calculus, integrals, and differential equations.

The course also includes a laboratory exercise on compressed air and water rocketry. Students will predict the flight path of a simple self-built rocket and compare their predictions to measurements taken by an onboard accelerometer.

**900141SCI Introduction to Chemistry**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Chemistry

*Prerequisites*

900122ACC Calculus

*Course description*

The main objective of this course is to provide students with understanding of the basic concepts of chemistry in such a way that they can apply these concepts to solve typical chemical problems in various fields of modern science. This course will focus on the first principles and concepts in the chemical sciences, especially in inorganic and organic chemistry.

Emphasis will be on a number of essential topics in modern chemistry. In the first part of the course the focus will be on the general principles in the chemical sciences. Special attention will be paid to the structure of atoms and their place in the periodic table and the properties of various types of chemical bonds. Other important topics are the characteristics of gases/liquids/solids, reaction kinetics and acid-based equilibria. The second part of the course will focus on organic and inorganic materials. Typical topics in this part of the course are nomenclature, isomerism, stereochemistry, electrochemistry and chemical bonding theory. Furthermore, an introduction to the reactivity of organic and inorganic compounds will be presented.

**900151SCI Ecology – From Soil to Society**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Biology, Earth&Environment

*Prerequisites*

None

*Course description*

Life can be studied at different levels of organization. The overarching levels ecology and ecosystem biology deal with relationships between individual organisms and the relationships between populations of individuals. In this course, we will first briefly focus on the key players in ecosystems: bacteria, plants, animals and fungi. We will further address their reciprocal interactions and how these contribute to the regulation of population size and the flow of energy and nutrients within ecosystems. In addition, we will address biodiversity: what factors determine biodiversity and how biodiversity affects ecosystem functioning. The interaction of ecosystem biology with humans will be covered in various ways. We will use invasive species as a tool to study ecological processes. These species often disrupt local ecosystems, providing natural experiments to study ecological processes. At the same time, they may impact strongly on the economy if they completely overtake the local ecosystem. Invasive species thus provides a strong linkage to ecological theory and society. Another link with society is the in the biological control of pests, which builds on predator-prey or parasite-host relationships. Finally, we will look how Global Climate Change may affect biodiversity and ecosystem functioning

Ecological theory is often underpinned by or even formulated in terms of mathematical models. During the course we will pay attention to this approach and we will practice some simulations of biological systems.

Ecology and biodiversity rely heavily on knowledge of the organisms involved. We will therefore pay due attention to learning to recognize some plants and animals (mostly insects).

Topics:

- Population ecology
- Communities and Ecosystems
- Biodiversity & Biogeography
- Human Impacts

### **900152SCI Introduction to Biology**

*Credit points*                6 *ecp*

*Theme*                        *ECS, LEU, HW, ICC*

*Track*                         *Biology*

*Prerequisites*

None

*Course description*

Biology is the Science of Life. Various themes may connect its diverse sub disciplines like inheritance, evolution, behaviour etc. A strongly unifying theme is the fact that all life is related by descent. This far reaching concept will serve as an umbrella for the following topics:

1. The universality of life. All living organisms share similar design principles. For instance, all organisms consists of cells, have DNA as the carrier if genetic information, use ATP as a currency of energy etc.
2. The diversity of life. Despite all commonalities, there is a huge variation in morphology, physiology, life cycles etc.
3. The feasibility of life. Despite the fact that organisms live in a wildly fluctuating external environment, they are able to maintain a rather constant internal environment.

Many aspects of these topics are well understood in molecular details, and we will thoroughly cover this ground.

Some core questions in biology are:

- What are the commonalities that all life shares?
- How did current diversity evolve in time?
- How can a single cell turn into a billion celled organism?
- How can life cope with the fluctuations of its environment?
- If competition is all pervasive, how can cooperation exist?

Although many of such questions are formulated in terms of organisms or a higher level of integration, all these questions have answers that extend down to the molecular level. So a satisfactory answer will always refer to that level too.

### **900161SCI The Human Body I – Anatomy and Physiology**

*Credit points*                6 *ecp*

*Theme*                        *ECS, LEU, HW, ICC*

*Track*                         *Biomedical Sciences*

### *Prerequisites*

None.

### *Course description*

The aim of this course is to provide a foundation for more advanced study of anatomy and physiology by introducing the constituent tissue types of the human body and fundamental concepts and terminology.

From this starting point, the first part of the course will focus on the organ systems that are involved in movement and in the integration of bodily functions. Consequently the anatomy and physiology of the musculo-skeletal system, the nervous system (including special senses) and the endocrine system will be reviewed. The role of the nervous and endocrine systems in integration will be discussed with reference to the principles of ergonomics and homeostasis.

The second part focuses on the pulmonary, cardiovascular, immune and urinary systems. We shall discuss how pulmonary ventilation is achieved and regulated and how oxygen and other substances are moved around the body and maintained at a balanced level. We will discuss the delivery of oxygen and substrates to the tissues for energy production, the removal of wastes and the maintenance of a stable internal environment in changing situations (for example during exercise). This module looks at the vital support systems that provide for these needs; the cardiovascular, pulmonary and urinary systems, as well as the defence mechanisms that protect the body. Since function is based upon structure we shall also review the anatomy of the organs that comprise these systems and explore how their functions are regulated. Finally, we will examine how the normal functions of these systems are changed by both exercise and disease. Other relevant topics are:

1. Concepts of risk in medical practice
2. Labour forces in health care system
3. An investigation of equality and inequality in the Dutch health care system.

Students will need to be able to:

- define and use correctly a range of anatomical terms;
- describe the histological structure and relate it to the function of the fundamental human tissue types, with particular reference to the skin;
- describe the development, role, structure and function of osseous tissue and the skeletal system;
- describe the development, role, structure and function of skeletal muscle fibres and the organisation and function of the muscular system;
- describe the development, role, structure and function of the nervous system and explain neural transmission and the action of drugs on the nervous system;
- describe the development, role, structure and function of the endocrine system and explain neural transmission and the action of drugs on the nervous system;
- explain the principles of homeostasis and describe the roles of the neural and endocrine systems in its maintenance;
- describe the physiological systems involved in transport of oxygen around the body and the removal of waste products;
- describe the composition and function of blood and overview the structure and regulation of the cardio-vascular system including the heart, the vascular system;
- describe the immune response and the involvement of the lymphatic system;
- describe the structure of the respiratory system, the transport of gases and the regulation of blood gas concentrations;

- describe how the urinary system works;
- explain the regulation of fluids and electrolytes;
- demonstrate competence in data presentation, analysis and interpretation, numeracy, information retrieval and written communication.

**900171SCI/SSC      Introduction to Public Health**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Health Sciences

*Prerequisites*

None.

*Course description*

This is an introductory course intended to introduce undergraduate students in a variety of disciplines to the basic tenets of public health. The course will provide a history of public health, an introduction to the core disciplines: epidemiology, biostatistics, environmental health, social and behavioural health, health economics and health policy and management, and current events and issues in the field.

Upon completion of this course, the student will:

- Define public health and the impact it has had on history
- Describe the evolution of public health, including its future development
- Describe how public health is measured and compared across regions or populations
- Describe how health interventions are created, implemented and evaluated
- Describe the structure of the public health system in the various countries (continents) including how policy is implemented and how it impacts public health practice
- List the basic study designs used in public health and provide examples of how they may be used, analysed and interpreted
- Describe the impact of chronic and infectious diseases on the health of populations
- Describe the variance in health status based on social and demographic factors and explain populations with special needs from a life cycle perspective
- Explain how public health impacts other fields and how it may be integrated
- Discuss the relationship between public health and the medical care system
- Describe the role of public health in a global society

**900181SCI/SSC      Introduction to Environmental Sciences**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Earth&Environment

*Prerequisites*

None

### *Course description*

This course serves as an introduction to and covers broad aspects of environmental science and environmental studies. The aim of this course is to provide students with the fundamental ideas and concepts in the field of environmental sciences and with the analytical tools needed for a considered reflection on the nature of environmental problems and its possible solutions.

Environmental science, as a discipline, combines aspects of the physical and biological sciences with issues from the social and political sciences. In this course, we will explore the concept of sustainability and how it relates to us, the scientific principles and concepts governing ecosystems and their processes, human population and resource use, how to sustain the biodiversity of the earth, and how we use our energy resources. This course should prepare students to continue to develop their environmental knowledge through further coursework. Important features of the course include systems thinking and critical reflection.

### **900191SCI Programming Your World**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Information Sciences

#### *Prerequisites*

None

### *Course description*

This course introduces students to modern programming techniques and provides them with basic programming skills.

Students will learn the basics of programming languages: syntax, semantics, program correctness and the interplay between programs and data structures, with illustrations in concrete (families of) programming styles: imperative, functional, object-oriented. The course explores aspects of modern programming through lectures and hands-on lab activities.

#### *Topics*

- Syntax
- Semantics
- Program correctness
- Interplay between programs
- Data structures
- Illustrations in concrete programming styles
- Imperative programming
- Functional programming
- Object-oriented programming

### **900225SCI Vector Calculus**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU,  
*Track*                        Maths

#### *Prerequisites*

Calculus and Linear Algebra  
(2013-14 Calculus 1 only)



### *Course description*

Tools for the description and analysis of multi-dimensional vector spaces are introduced, studied, and trained in exercises and assignments. This will be done in sessions that combine lecturing and problem solving. The material will be applied to the calculus of functions between multi-dimensional spaces, and results in the classical theorems by Green, Gauss and Stokes.

Topics include:

- Vectors and coordinate geometry in 3-space
- Vector functions and curves
- Functions of two and more variables, partial derivatives
- Gradient and directional derivatives
- Optimization
- Implicit function theorem
- Multiple integration and iterated integration
- Polar and spherical coordinates
- Line integrals and vector fields
- Surfaces and surface integrals
- Divergence and rotation
- Theorems of Green, Gauss and Stokes
- Applications (fluid dynamics, electromagnetism)

Students will also practice exercises in-class to develop their skills.

### **900227SCI Dynamical Systems**

*Credit points*

*6 ecp*

*Theme*

*ECS, LEU, HW, ICC*

*Track*

*Mathematics*

### *Prerequisites*

Calculus (Linear Algebra recommended)

*(2013-14 Calculus 1 only)*

### *Course description*

Dynamical systems appear as models in applications whenever a nontrivial mechanism is at work. Dynamical systems are an ever-evolving component of mathematics. The different contexts include physics, chemistry, biology, economics and also the social sciences. In this course students will develop an understanding of the intriguing properties of dynamical systems. They will learn how to extract information from the model which is essential for the application of interest. Both discrete time and continuous time dynamical systems will be considered, leading to nonlinear (iterative) maps and (ordinary) differential equations. Famous examples from population dynamics in biology will be studied. Mathematical existence and uniqueness results reflect the deterministic nature of the models. Students will study linear dynamical systems, stationary states and their (in)stability, periodic behavior, chaos, global behavior of scalar maps and differential equations in the plane, as well as bifurcation theory.

### **900228SCI Numerical Mathematics**

*Credit points*

*6 ecp*

*Theme*

*ECS, LEU, HW, ICC*

*Track*

*Mathematics*

### *Prerequisites*

Calculus, Linear Algebra (Vector Calculus recommended)  
(*Prerequisites in 2013/14: Calculus 2*)

### *Course description*

Numerical mathematics is used frequently in all areas of science (e.g. fluid dynamics, meteorology and financial risk management). In many applications one encounters mathematical problems that cannot be solved through manipulations of formulas and, in such cases, numerical methods are used. These algorithms, implemented in computer programs, are at the core of scientific computing. In this course, students will learn the mathematical principles behind these numerical techniques and will apply them to non-trivial problems in applications outside of mathematics. The course focuses on the main numerical methods from modern day analysis and scientific computing. The theory is implemented in hands-on practical assignments. The list of subjects includes: error analysis, systems of linear equations, eigenvalue problems, interpolation, least square methods, fast Fourier transform, non-linear equations and ordinary (and partial) differential equations. Applications include Google page rank, data analysis and planetary orbits. A number of matlab assignments will also form an integral part of the course.

### **900229SCI Probability and Statistics**

*Credit points*                    6 *ecp*  
*Theme*                                ECS, LEU, HW, ICC  
*Track*                                  Mathematics

### *Prerequisites*

Calculus (Linear Algebra, highly recommended)  
(*Prerequisites in 2013-14: Calculus 1*)

### *Course description*

Many phenomena are subject to chance variation: economic time series, sampling of respondents in a survey (and subsequent lack of response), measurement error, survival after a medical treatment, physics of large systems, etc. Probability theory is the mathematical formalism to model such diverse phenomena. This course starts by introducing some key concepts or probability theory:

- Random variables and vectors
- Probability distributions and densities
- Independence and conditional probability
- Expectations
- Law of large numbers and central limit theorem.

Some models concern discrete systems and can be handled by elementary mathematics. However, emphasis will be on continuous phenomena, for which calculus of functions of one or more variables (as introduced in ACC 122) is necessary.

Probability models are the basis for statistical analysis. Whereas descriptive statistics is concerned with averages and numerical tables, statistical inference tries to answer scientific questions regarding financial series, earth quakes, the health effects of certain foods, etc. This is done by modelling data as the outcome of a chance experiment. Statistics next aims at inferring the probability model for this experiment from the data. Methods are developed, understood and investigated from this perspective. Drawing up a reliable model for the underlying chance experiment is not always easy, but once available this allows making

optimal decisions and quantifying the remaining uncertainty and possibility for generalization. Key concepts discussed in this course are:

- Likelihood
- Estimation, testing, p-value, confidence regions
- Risk and power functions
- Bayesian inference.

The emphasis is on concepts, but well known concrete methods as the t-test, regression or anova arise as examples. The course is modern in its connection to recently developed methodology. Some examples of data-analysis, using standard software, may be included in the problem class that accompanies the lectures, depending on the background and interests of the students.

### **900231SCI The Physics of Heat**

*Credit points*            6 ecp  
*Theme*                    ECS, LEU, HW, ICC  
*Track*                     Physics

#### *Prerequisites*

900133SCI Introduction to Physics, and 900122ACC Calculus

#### *Course description*

This course introduces, discusses and derives the thermodynamical concepts of equilibrium, temperature and entropy. The role of energy, heat and work in thermodynamical systems will be explained, as well as diffusion and specific heat. The meaning of the Carnot cycle, reversible and irreversible processes will be discussed. Furthermore, the concepts of ensemble theory, Boltzmann statistics, partition functions, free energy, Bose-Einstein and Fermi-Dirac statistics will be studied. Applications that will be discussed include the ideal gas, Maxwell distribution, black body radiation, heat engines and refrigerators, phase transitions, magnetic systems and more, including attention to chemical and biological applications.

### **900233SCI Quantum Physics**

*Credit points*            6 ecp  
*Theme*                    ECS, LEU, HW, ICC  
*Track*                     Physics

#### *Prerequisites*

900133SCI Introduction to Physics and 900123ACC Calculus and Linear Algebra II

#### *Course description*

This course introduces and discusses the experimental basis, historical basis and the general formalism of quantum physics. The course also focuses on the wave function and its probabilistic interpretation leading to the fundamental Heisenberg uncertainty relations. The Schrödinger equation will be introduced and some important quantum systems will be studied, such as the particle in a box and the harmonic oscillator. In addition, the concept of quantum tunneling will be discussed. Furthermore, the formal framework of a Hilbert space will be introduced. The concepts of angular momentum, spin, fermions and bosons will be discussed. An important case study will be the hydrogen atom. Applications in

chemistry will be discussed, such as the periodic table, the structure of molecules, and some of their properties.

The conceptual problems that came with quantum theory will be given sufficient attention, in particular the measurement problem. We will also discuss the modern perspective on quantum theory through quantum information and its applications in cryptography. Black holes will be used to discuss the extent to which quantum theory can still today claim to be the final theory.

### **900234SCI Statistical Mechanics (Physics of Large Systems)**

*Credit* 6 ecp

*points*

*Theme* ECS, LEU,

*Track* Physics

*Prerequisites*

The Physics of Heat

#### *Course description*

From the air we breathe to the food we eat, our daily life consists of interactions with environments, which contain  $10^{24}$  or more particles. The only feasible way of understanding such enormous systems is with methods of probability and statistics. This course introduces the relevant techniques, which are an essential part of the toolkit of a modern physicist, chemist, and -- increasingly -- biologist.

Our first goal will be to derive and understand from a microscopic viewpoint the concepts learned in Physics of Heat, including temperature, entropy, and free energy. In doing so, we shall make use of a powerful and broadly applicable concept of an "ensemble", a collection of all possible microscopic states of the system. The course will close with some more advanced topics in statistical mechanics: renormalization, which relates the physics at different scales and critical exponents, which provide a robust quantitative description of phase transitions.

The problem sets and research project will highlight the broad applicability of statistical mechanics, from the physics of living systems to black holes and string theory. The common motif, which explains why the content of this course is useful in such diverse disciplines, is the (almost) universal emergence of simplicity in large, complex systems.

### **900239SCI Physics Lab**

*Credit points* 6 ecp

*Theme* ECS, LEU, HW, ICC

*Track* Physics

*Prerequisites*

Any 200-level physics course

#### *Course description*

Laboratory experimentation in almost all science disciplines is key to model building, scientific progress and advances in various fields of technology. An AUC science student should be equipped with the necessary knowledge to set up an experiment, interpret the data and place the findings within the context of the related sciences discipline(s). In other words, students should explore and develop the characteristics of an experimental research-process by doing experiments.

All Science Laboratory Courses are connected to related 100 or 200-level disciplinary courses in order to set the necessary foundation for the experimental approach.

A typical AUC Science Laboratory Course consists of the following components:

- Students should become familiar with the literature related to the discipline of the experiment,
- Formulate a research question/hypothesis,
- Design an experimental procedure (taking into consideration safety issues),
- Execute the lab experiment,
- Document the experiment (that lab report),
- Evaluate the experimental data (including statistical analysis and computational processing),
- Analyse the results (model building), placing the findings in context of literature, and
- Report on the entire process.

### **900241SCI Metabolic Biochemistry**

*Credit points*            6 ecp

*Theme*                    ECS, LEU, HW, ICC

*Track*                     Chemistry, Biomedical Sciences

#### *Prerequisites*

900141SCI Introduction to Chemistry or 900152SCI Introduction to Biology or 900161SCI The Human Body 1

#### *Course description*

This course examines the generation of metabolic energy in higher organisms with an emphasis on its regulation at the molecular, cellular and organ level. Chemical concepts and mechanisms of enzymatic catalysis will be emphasized, as well as selected topics in carbohydrate, lipid and nitrogen metabolism. Complex lipids and biological membranes, along with hormonal signal transduction, will also be discussed.

### **900242SCI Medicinal Chemistry**

*Credit points*            6 ecp

*Theme*                    ECS, LEU, HW, ICC

*Track*                     Chemistry

#### *Prerequisites*

900141SCI Introduction to Chemistry or 900252SCI Molecular Cell Biology

#### *Course description*

Medicinal Chemistry is an highly interdisciplinary discipline at the interface of chemistry and biology. In this course a general introduction will be given to the process of drug discovery, drug design and synthesis, drug development and drug safety assessment. Subsequently, potential drug targets, mechanisms of drug actions (including drug-receptor/enzyme interactions and dose-response relations), drug disposition (including pharmaco-/toxicokinetics) and drug toxicity will be discussed. Using various drug classes, relationships between chemical structures and biological activities will be derived and illustrated. Finally, various modern developments and tools will be illustrated by recent applications in the field of medicinal chemistry.

**900243SCI Environmental Chemistry/Eco-Toxicology**

*Credit points*                6 ecp  
*Theme*                        ECS, LEU, HW, ICC  
*Track*                         Chemistry, Earth&Environment

*Prerequisites*

900141SCI (Introduction to Chemistry) or 900152SCI (Introduction to Biology), or 900181SCI (Introduction to Environmental Sciences; only Science majors)

*Course description*

This interdisciplinary course examines the presence of chemical pollution in the environment and its effect on biological processes ranging from the molecular to the population level. The course consists of four main topics.

1. Environmental Chemistry addresses aspects as sources, characteristics, transport and fate of chemicals, including food web transfer and bioaccumulation.
2. Environmental Toxicology studies the kinetics, toxic effects and interactions of chemicals in the environment.
3. Monitoring of Pollutants discusses methods and strategies to determine exposure to well-known and emerging chemicals in the environment?
4. Risk Assessment addresses methods to derive safe exposure levels for humans and the environment, and to characterize their risk at environmental levels of exposure.

Throughout the course, several classes of compounds will be discussed such as mutagens, pesticides, PCBs and dioxins, flame retardants, perfluorinated compounds and (other) endocrine disruptors.

**900249SCI Diagnostics and Analytical Chemistry Lab**

*Credit points*                6 ecp  
*Theme*                        ECS, LEU, HW, ICC  
*Track*                         Chemistry, Earth&Environment

*Prerequisites*

900243SCI Environmental Chemistry/Eco-Toxicology

*Course description*

Laboratory experimentation in almost all science disciplines is key to model building, scientific progress and advances in various fields of technology. An AUC science student should be equipped with the necessary knowledge to set up an experiment, interpret the data and place the findings within the context of the related sciences discipline(s). In other words, students should explore and develop the characteristics of an experimental research-process by doing experiments.

All Science Laboratory Courses are connected to related 100 or 200-level disciplinary courses in order to set the necessary foundation for the experimental approach.

A typical AUC Science Laboratory Course consists of the following components:

- Students should become familiar with the literature related to the discipline of the experiment,
- Formulate a research question/hypothesis,

- Design an experimental procedure (taking into consideration safety issues),
- Execute the lab experiment,
- Document the experiment (that lab report),
- Evaluate the experimental data (including statistical analysis and computational processing),
- Analyze the results (model building), placing the findings in context of literature, and
- Report on the entire process.

### **900251SCI Genomics and Bioinformatics**

*Credit points*                6 ecp  
*Theme*                         ECS, LEU, HW, ICC  
*Track*                         Biology, Biomedical Sciences,  
    Information Sciences

#### *Prerequisites*

900152SCI Introduction to Biology

#### *Course description*

Students will study concepts and techniques related to traditional and modern genetics. The course provides students with a comprehensive overview of conjugation and recombination, gene regulation, forward and reverse genetics, gene linkage, mutagenesis screens, population genetics, genomics and functional genomics. The course also explores the applications of bioinformatics in modern life sciences.

### **900252SCI Molecular Cell Biology**

*Credit points*                6 ecp  
*Theme*                         ECS, LEU, HW, ICC  
*Track*                         Biology, Biomedical Sciences

#### *Prerequisites*

900152SCI Introduction to Biology or 900161SCI The Human Body I

#### *Course description:*

This course focuses on the functioning of cells in relation to each other and in relation to the extracellular environment as part of a multi-cellular organism. The course introduces and discusses the different parts of cells and how these different constituents function in relation to other cells in the direct vicinity, and to cells at a distance.

The following topics will be discussed and presented:

- Cell-cell interactions
- Signal transduction
- Cell communication
- Cell-extra-cellular matrix interactions
- Cell migration
- Cell death
- Stem cells
- Different cell types in different tissues

After this course the student should be able to understand the functioning of a cell on its own and in relation to its environment. The student should be able to describe the fundamental processes that take place inside the cell that are related

to e.g. protein synthesis, gene expression, cell division, membrane metabolism, energy generation and cell movement.

### **900253SCI Evolution and Developmental Biology**

*Credit points*                6 ecp  
*Theme*                        ECS, LEU, HW, ICC  
*Track*                         Biology

#### *Prerequisites*

900152SCI Introduction to Biology

#### *Course description*

Students will study the field of biology that seeks to explain evolutionary events through the mechanisms of developmental biology and genetics. Students will attempt to determine ancestral relationships between organisms and how developmental processes have evolved. Topics will include the early body plan, cell type determination, organogenesis, morphogenesis, stem cells, cloning and other issues in human development.

### **900261SCI The Human Body II**

*Credit points*                6 ecp  
*Theme*                        ECS, LEU, HW, ICC  
*Track*                         Biomedical Sciences

#### *Prerequisites*

900161SCI The Human Body I

#### *Course description*

The course Human Body II focuses on the structure and function of a multi-cellular system, the human body. Each human body is built up of ten thousand times more cells than the number of the entire human world population. These cells are organized in tissues that form the organs. This extremely complex system can only exist by rigorous organization and regulation which starts at the moment that an oocyte (egg cell) is fertilized by a sperm cell and continues until the body dies. Key elements of the organization and regulation involve the differentiation of cells. All cells in a human body contain the same genetic make-up (genome) but by differential use of the genome (transcription) cells are capable of exerting the correct function at the correct location (for example, stem cells differentiate into oocytes in the ovaries, into sperm cells in the testes and into cells that take up nutrients in the small intestines and in those places only). Differentiation of cells is the end point of a rigorous communication system of the body, including nerve cells, hormones, cell-cell communications, messenger molecules at long range (cytokines) and short range (nitric oxide and other gases) and many others. This miracle of biocomplexity of the human body is the topic of this course. Two organ systems are used as examples of differentiation and function related to structure: the sex organs and the gastro-intestinal tract. Focus is on the development of differentiation early during embryogenesis (from the fertilized oocyte onwards) and on the functioning of the organs in a mature body.



### **900262SCI Hormones and Homeostasis**

*Credit points*                6 ecp  
*Theme*                        ECS, LEU, HW, ICC  
*Track*                         Biomedical Sciences

#### *Prerequisites*

900161SCI The Human Body I

#### *Course description*

Almost all diseases are failures of homeostasis. Students will study the principles of homeostasis and complex regulatory mechanisms (for instance: intestinal homeostasis, bone homeostasis, iron homeostasis, blood pressure regulation, homeostasis of body temperature). The main focus of the course is hormonal regulations in relation to homeostasis (for instance: energy, growth, reproduction, stress, blood glucose) in humans.

Topics include types of hormones, the structure and function of hormone receptors, negative and positive feedback mechanisms, counter regulatory hormones, functional anatomy and histology of the endocrine system. The course centres on recent medical aspects (function/dysfunction) of the human endocrine and metabolic processes. Students will become familiar with endocrine diseases, diabetes and will understand (pharmacological) management of these diseases and the complications involved.

During the course students will use recent scientific literature to prepare for individual or small group oral presentations.

### **900263SCI Immunology**

*Credit points*                6 ecp  
*Theme*                        ECS, LEU, HW, ICC  
*Track*                         Biomedical Sciences

#### *Prerequisites*

900161SCI The Human Body 1 or 900152SCI Introduction to Biology

#### *Course description*

Micro-organisms play an ambiguous role in our life. Whereas we tolerate billions of commensal bacteria in the gastrointestinal track, at the same time we have to build up highly sophisticated immune responses against a variety of life-threatening bugs (e.g. viruses, bacteria, fungi, parasites) that invade our body on the daily basis. On top of that, such bugs have evolved to evade our tailor-made immune system with an impressive number of tools. As a result, certain bugs may chronically infect our body and continuously form a potential danger, in particular in conditions of poor health. In addition, a calculated risk is that immune responses are associated with collateral damage that may even result in our death. Finally, the immune machinery may turn against us resulting in autoimmune and allergic diseases, of which the prevalence seems to increase in certain countries.

Relevant questions in the field are 1) how our immune system manages to address the enormous variety of bugs, 2) how responses to harmless commensals, as well as autoimmunity and allergy are prevented and why the prevalence of these diseases increases, and 4) how immune-mediated diseases are characterized and how they can be treated.

In this course we will analyse the battle against bugs by discussing the initiation of innate and adaptive immune responses. In this course we will learn about:

1. The receptors and cells that are used to recognize different classes or strains of microorganisms and the diversity of precise and less precise weapons immune cells have available.
2. The internal control mechanisms that diminish collateral damage and prevent autoimmunity and allergy, as well as the role of the environment herein.
3. The immune-mediated diseases and their treatment (chronic infection, autoimmunity, allergy).

**900264SCI/SSC Brain and Cognition (for Science majors)**

*Credit points*

*6 ecp*

*Theme*

*ECS, LEU, HW, ICC*

*Track*

*Biomedical Sciences, Cognition*

*Prerequisites*

900152SCI Introduction to Biology or 900161SCI The Human Body 1

*Course description*

In this course students will become familiar with basic key concepts in (cognitive) neuroscience. The goal of this course is to deepen understanding of the neurobiology of the mind and the aetiology of mental disorders. Students will be encouraged to critically analyse the impact of neurobiology and (psychiatric) brain disorders on society.

To most of us, the mind constitutes as the very essence of our identity. However, where to draw the line between normal and abnormal, well and ill, an eccentric personality and a schizotypic one, an active, creative fast-thinking personality and ADHD?

This course will explore the neurobiology of the mind. First, students will be provided with a concise overview of the structure and function of the human brain and will be introduced to the basics of neural communication (electrical signalling and synaptic transmission). Next, the focus will be on key concepts in cognitive neuroscience such as perception, memory, attention, emotion and consciousness. A selection of relevant topics will be covered in depth (partly by students' presentations); possibilities include: altered states of consciousness, neurobiology of attraction and partner selection, creativity and mental illness, the gendered brain, the moral brain, free will, empathy and mirror neurons, intelligence, neurobiology of belief, superstition and religion, brain-machine interfaces, cognitive enhancers, mind control (this list is by no means exhaustive).

An important focus of this course is the aetiology of mental disorders, such as ADHD, depression, addiction, autism and schizophrenia, with special attention for the nature-nurture discussion. Students will be challenged to critically reflect on the boundaries between normality and abnormality and the implications for society.

**900269SCI Cell Biology and Physiology Lab**

*Credit points*            6 ecp  
*Theme*                    ECS, LEU, HW, ICC  
*Track*                     Biomedical Sciences

*Prerequisites*

900161SCI The Human Body or 900252SCI Molecular Cell Biology

*Course description*

Laboratory experimentation in almost all science disciplines is key to model building, scientific progress and advances in various fields of technology. An AUC science student should be equipped with the necessary knowledge to set up an experiment, interpret the data and place the findings within the context of the related sciences discipline(s). In other words, students should explore and develop the characteristics of an experimental research-process by doing experiments.

All Science Laboratory Courses are connected to related 100 or 200-level disciplinary courses in order to set the necessary foundation for the experimental approach.

A typical AUC Science Laboratory Course consists of the following components:

- Students should become familiar with the literature related to the discipline of the experiment,
- Formulate a research question/hypothesis,
- Design an experimental procedure (taking into consideration safety issues),
- Execute the lab experiment,
- Document the experiment (that lab report),
- Evaluate the experimental data (including statistical analysis and computational processing),
- Analyze the results (model building), placing the findings in context of literature, and
- Report on the entire process.

**900271SCI/SSC Nutrition and Health**

*Credit points*            6 ecp  
*Theme*                    ECS, LEU, HW, ICC  
*Track*                     Health

*Prerequisites*

900171SCI Introduction to Public Health

*Course description*

Nutrition is the essence of life and plays a central role in the health of individuals and populations. Therefore, nutrition by definition requires an interdisciplinary perspective drawing on fields as diverse as anthropology, biology, chemistry, epidemiology and economics. The course will emphasize an interdisciplinary perspective in understanding nutrition and related (public) health consequences. The nutrition-related biological mechanisms will be used as a basis to discuss how culture, society and economic factors relate to (public) health. Students will also be expected to discuss the impact of changing dietary patterns on public health, including both chronic disease and under-nutrition. The emphasis of the course will be on (guided) student led learning. In the last part of the course, every

student will formulate a research question and write a review of a nutrition-related topic using both epidemiological as well as biological information.

**900272SCI/SSC International Public Health**

*Credit points* 6 ecp  
*Theme* ECS, LEU, HW, ICC  
*Track* Health

*Prerequisites*

900171SCI Introduction to Public Health

*Course description*

This course explores the field of international health within the broader context of health and development. Basic issues related to major diseases and conditions in developing countries, including international health organisations and their influence on approaches to prevention, treatment and control, will be reviewed from a cross-cultural perspective.

Topics covered during the course will be; culture, behaviour and health, reproductive health, infectious diseases, nutrition, chronic diseases, mental health, environmental health, health systems, health and economy, and globalization. Many of these health issues will be discussed using a human rights approach and/or the millennium goals. Part of the course will be devoted to creating a country profile regarding health status and evaluating existing health promotion or prevention programs.

**900273SCI/SSC Epidemiology**

*Credit points* 6 ecp  
*Theme* ECS, LEU, HW, ICC  
*Track* Health

*Prerequisites*

900171SCI Introduction to Public Health and 900121ACC 121 Basic Research Methods and Statistics 1

*Course description*

The objective of the course is to learn and apply epidemiological methods to determine exposure/disease relationships. Students will study risk factors affecting health conditions and will be provided with a foundation in intervention strategies (preventive medicine). This discipline brings together the biological (medicine) and social sciences. Topics include measures and statistical terminology; observational studies; interventional studies; and public health surveillance. The course will also examine epidemiological study designs and measures of disease risk used in etiological epidemiology and health services research.

**900282SCI Hydrology and Watershed Management**

*Credit points* 6 ecp  
*Theme* ECS, LEU, HW, ICC  
*Track* Earth&Environment

*Prerequisites*

900121SCI Introduction to Geological Sciences or 900181SCI Introduction to Environmental Sciences

### *Course description*

Large lowland fluvial and coastal settings are especially susceptible to global environmental change, but include dense populations of increasing vulnerability. The adaptation of appropriate management strategies within these settings requires an understanding of fundamental hydrologic and coastal processes, as well as an appreciation for the challenges in implementing management within a complex social and political framework. The purpose of this course is to examine the physical processes and management of fluvial and coastal environments, with a focus on large river basins and deltas. Topics to be examined over the semester include water resources and hydrology, erosional and sedimentary processes, river and coastal engineering, flooding and storm surges, policy and restoration, international basin management, and global environmental change. The course will include two field trips and laboratory assignments.

### **900283SCI System Earth**

*Credit points*            6 ecp  
*Theme*                    ECS, LEU, HW, ICC  
*Track*                      Earth&Environment

### *Prerequisites*

900121SCI Introduction to Geological Sciences or 900181SCI Introduction to Environmental Sciences

### *Course description*

The primary goal of this course is to examine Earth's surface processes with a focus on understanding the interaction between Earth's four major spheres: The lithosphere, atmosphere, biosphere, and hydrosphere. A secondary course goal is to examine how humans impact and interact with Earth's surface, particularly from the perspective of modern environmental change and natural hazards. The course adapts a systems and process approach, and students will also be introduced to fundamental concepts in Earth science that serve as a foundation for advanced courses.

### **900289SCI Field course in Environmental Earth Sciences**

*Credit points*            6 ecp  
*Theme*                    ECS, LEU, HW, ICC  
*Track*                      Earth&Environment

### *Prerequisites*

Introduction to Geological Sciences and one of the following courses: System Earth or Hydrology and watershed management

Costs: to be announced.

### *Course description*

The lab course is largely field based (2 full weeks in the Ardennes), and includes mapping techniques, field observation, documentation and interpretation of results.

Students will learn to make actual, relevant and accurate observations on the dynamic processes in the Earth, so that they will be able to do independent research in the field. We will focus on geological and geomorphological processes.

1. develop standard skills in geological observation techniques, including landforms, geomorphology mapping and processes, geological map, fossil assemblages, paleo-environments, deformation structures and metamorphism, stratigraphic logging
2. documentation of observations
3. being able to think in geological dimensions of space and time
4. basic research methods in geosciences; i.e. testing hypothesis, research planning, writing of scientific report

This lab course addresses the scientific method and observational skills valuable for Earth Science and will prepare for a capstone in the Earth and Environmental Sciences

A continuous period of 16 days will be spend in the field, lodging and working space will be available. Students should be physically fit. A typical day in the field will include 9 hours outdoor activity, 3 hours of data processing, reporting and discussion.

### **900294SCI Advanced Programming**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>ECS, LEU, HW, ICC</i>
<i>Track</i>	<i>Information Sciences</i>

#### *Prerequisites*

900191SCI Programming your World

#### *Course description*

The Advanced Programming course explains the idea that a program itself can be the subject of study and can serve as input and output of so-called meta-programs.

This insight is crucial for the success and versatility of the computing domain itself and for all its application areas; it forms the foundation for compilers, software analysis

tools, code generators, domain specific languages and model-driven engineering.

Relevant questions are:

- How to parse and analyse the source code of a program?
- How to represent and compute with the facts that have been extracted from source code?
- How to transform source code?
- How to synthesize and visualize the results of analysis and transformation?

Building on and extending the initial programming skills that have been acquired in the prerequisite course Programming your World, this course follows the Extract-

Analyse-SYnthesize (EASY) paradigm for metaprogramming and presents methods for extracting facts from programs and other data (using regular expressions, parsing), for representing these facts (using lists, sets, tuples, and relations), for analysing them (by computing metrics, checking types, and interpretation), and for synthesizing results (using code generation and visualization).

The underlying theories of the material presented in this course are formal languages and automata, relational calculus, and term rewriting. Concepts from these theories will be introduced when they are needed during the course.

### **900295SCI Data Structure and Algorithms**

*Credit points*            6 ecp  
*Theme*                      ICC  
*Track*                        Information Sciences

#### *Prerequisites*

None

#### *Course description*

The overall objective of this course is to equip the student with a set of tools, including analytical skills, that will enable him/her to create programmable and efficient solutions for real world problems. As programming involves the manipulation of data, it is important to be able to analyze, design, program (apply the design), and select the appropriate data structures required to solve specific problems. Using real world example, this course acquaints students with design principles and complexities of operations and algorithms when performed on various data structures. Topics included are: data structures such as stacks, queues, trees heaps and operations, algorithm performance, complexity issues, sorting algorithms, searching algorithms. At the end of the course students will be able to:

- Define data structures studied.
- Describe the category of problems each data structure can be used to solve.
- Design a collection class for each of the data structures studied including lists, nodes, stacks, queues, trees, binary trees, heaps, hash tables, and graphs.
- Create simple programs implementing each of the data structures studied including lists, nodes, stacks, queues, trees, binary trees, heaps, hash tables, and graphs.
- Evaluate the different data structures in terms of time and their efficiency.

### **900296SCI Machine Learning**

*Credit points*            6 ecp  
*Theme*                      ICC  
*Track*                        Information Sciences

#### *Prerequisites*

Programming your World

#### *Course description*

Machine Learning aims at methods for using (large) amounts of observational data to discover patterns. These patterns can be used to make predictions or to enable a system to improve its behaviour. Machine learning has its theoretical roots in Artificial Intelligence, Statistics, Information Theory and Optimization. This course will introduce students to the basic methods for supervised learning (e.g. classification) and unsupervised learning (e.g. clustering). Students will develop an understanding of the fundamental concepts of machine learning and acquire skills in applying basic methods to realistic real world learning problems.

Teaching will consist of lectures, working sessions and computer lab sessions. Topics include Decision-Tree learning, Bayesian Learning, Neural Networks, Clustering and Optimization Algorithms. The textbook for the course will be Chris

Bishop's book "Neural Networks for Pattern Recognition". Assignments will consist of written exercises and programming assignments using Python. In a course project a realistic problem will be addressed. Each lecture starts with a brief quiz testing knowledge of the material discussed during the previous lecture and the assigned reading material for the current lecture.

**900299SCI Information Lab**

*Credit points*            6 ecp  
*Theme*                    ICC  
*Track*                    Information Sciences

*Prerequisites*

Machine Learning

*Course description*

The purpose of this intensive lab course is to provide students with a first experience in state-of-the-art machine learning methods for functional neuro-imaging. The course covers some basic aspects of MRI-based neuro-imaging data acquisition, experimental design, and data analysis. The core of the course is a project in which students apply and compare various machine learning methods in the context of neuro-image analysis. Students will be provided with existing neuro-imaging data (fMRI of subjects viewing different movie genres) and machine learning techniques (python), and are asked to determine in groups what brain regions contain information about the visual stimuli. The groups will compete against each other: the task being to predict on the basis of fMRI as accurately as possible what type of visual stimuli was seen. This requires groups to explore different machine learning techniques applied to different combinations of brain regions. At the end of this course:

- Students are acquainted with basic mechanism of perceptual and emotional processing.
- Students get an overview of tools and techniques to analyse brain activity data.
- Students learn to use and compare machine learning technique in a specific real problem.
- Students are able to design and conduct an experiment using appropriate research and analysis methods.
- Students can evaluate and report about validity and limitations of scientific claims.

**900311SCI Theme course Energy, Climate and Sustainability: a case study**

*Credit points*            6 ecp  
*Theme*                    ECS  
*Track*                    n/a

*Prerequisites*

200-level courses related to this theme; exclusively for 300 level students



### *Course description*

Students will critically reflect on the key topics addressed by the three IPCC working groups in the 4th assessment report. They are aware of the most important uncertainties and controversies in the climate debate. They are able to take a position in this debate based on scientific arguments and write a thoughtful paper about it that is understandable to experts and non-expert scholars.

The course is split into three parts:

#### A) Theory

Some of the most important issues in the IPCC 4th Assessment Report are highlighted at the start of the course.

(I) The physical basis of climate change,

- The Climate System
- The relationship between temperature and CO<sub>2</sub> concentration
- Post-industrial GHG emissions

(II) Impacts, adaptation and vulnerability,

- Flood risks / water resources
- Extreme events / risks

(III) Mitigation

- Hydro power / Pumped storage
- Carbon Capture and Storage
- Clumsy solutions

#### B) Essay writing

In consultation with the participating students we will define the topics that the students will write an essay of about eight to ten pages. The essay will elaborate a specific controversy in the climate debate, discuss arguments and take a position in the debate.

#### C) Feedback

The final draft essays will be reviewed by peers. The provisional results will be presented to the other students.

### **900312SCI Theme course Life, Evolution, Universe: Astroparticle Physics**

*Credit points*                      6 *ecp*

*Theme*                                      LEU

*Track*                                        n/a

#### *Prerequisites*

900SCI232 Astrophysics and Cosmology and 900SCI233 Quantum Physics; exclusively for 300 level students

#### *Course description*

Astroparticle physics is a multidisciplinary field, which connects the study of the smallest scales (elementary particles) with the largest scales (the Universe). Important topics are the origin of cosmic rays, gravitational waves, the physics of the early Universe, and the nature of dark energy and dark matter. The latter forms an important theme of the present course. For that reason the course starts with the evolution of the Universe, from the Big Bang to the Universe today, and the role of dark matter and dark energy in that evolution. This includes descriptions of the large scale structures, the early Universe, nucleosynthesis, inflation, and the cosmic microwave background. After a short interlude on cosmic ray acceleration, we turn to the microscopic constituents and discuss quarks and leptons, and their interactions and symmetries. We conclude by considering particles such as neutrinos, charged particles etc. as probes of the

physics that occurs in the Universe. The course does not only describe the theoretical aspects of astroparticle physics, but also provides ample discussion of experimental evidence.

**900313SCI Theme course Life, Evolution, Universe/ Health and Well-being: From Systems Biology to Systems Medicine**

*Credit points*            6 *ecp*  
*Theme*                      LEU, HW  
*Track*                        n/a

*Prerequisites*

200-level courses related to this theme, preferably Metabolic Biochemistry and Genomics and Bioinformatics; exclusively for 300 level students

*Course description*

It has become increasingly clear that the cause of human disease is often determined not by a single factor or genetic determinant, but by a combination of numerous factors. Complex traits such as obesity are polygenic in nature such that changes in DNA on their own do not lead to disease, but instead lead to changes in molecular networks that go on to affect disease risk. Therefore, the interrelationships between various phenotypes such as mRNA abundance, metabolites and physiological traits altogether constitute the functional unit that must be examined to understand disease mechanisms.

In the past 10 years or so, there has been considerable progress made in the development of new "omics" technologies, that generate a large array of data on different aspects of metabolic activity. They include analysis of variations in the DNA (SNP analysis), gene expression profiling (transcriptomics), protein levels (proteomics) and metabolite patterns (metabolomics). The approach to integrate all these data is called Systems Biology (SB), but its application in human medicine ("Systems Medicine") is still in an embryonic phase. This course will deal with approaches that are currently developed to enable the fruitful application of SB approaches in human medicine. Special emphasis will be given to the application of SB on the Metabolic Syndrome, a cluster of conditions such as increased blood pressure, excess body fat around the waist (obesity), elevated insulin levels, and abnormal cholesterol levels. This condition leads to an increased risk of developing cardiovascular disease and diabetes, and has become the major threat for human health in developed and developing countries.

The course will include an overview of cellular metabolism, inter-organ relationships important for the regulation of metabolism, different "omics" technologies, and different methods to construct and analyze metabolic networks. In addition, the use of so-called genetic reference mouse populations (GRPs) will be presented. GRPs incorporate the natural range of DNA variation which can be used as a systematic source of perturbation on the molecular networks that precipitate metabolic disease. GRPs therefore resemble human populations much better than classical knock-out models in mice. Subsequent statistical integration of the different "omics" data in these mice enables the genetic mapping of many novel intermediate phenotypes, and facilitates the creation of molecular networks that better define the biological flow from DNA variation to complex trait expression. Finally, the relevance of SB approaches for drug development will be discussed.

**900314SCI/SSC Theme course Health and Well-being: Lifestyle and Disease**

<i>Credit points</i>	6 ecp
<i>Theme</i>	HW
<i>Track</i>	n/a

*Prerequisites*

200-level courses related to this theme; exclusively for 300 level students

*Course description*

Diseases such as cancer, cardiovascular diseases, diabetes mellitus and obesity contribute largely to the global burden of disease. Important risk factors of these diseases are within the domain of lifestyle; scientific evidence shows a clear relation with dietary behaviours and physical activity. The strong association with lifestyle implicates that the majority of these diseases are preventable.

A planned approach of disease prevention and health promotion is desirable to develop effective interventions and public health solutions. This approach entails a thorough process from analysing the public health problem, to identifying the lifestyle factors that cause the problem, to assessing the behavioural determinants of the relevant behaviours to selecting suitable intervention strategies and evaluation of the entire process.

**900322SCI Partial Differential Equations**

<i>Credit points</i>	6 ecp
<i>Theme</i>	ECS, LEU,
<i>Track</i>	Maths

*Prerequisites*

Linear Algebra and Vector Calculus  
(*Prerequisites in 2013-14: Calculus 2*)

*Course Content*

The majority of physical phenomena can be described by partial differential equations (Maxwell equation for electromagnetism, Schrödinger equation in quantum mechanics, Einstein equation in general relativity, diffusion equation in thermodynamics, wave equation in optics). Partial differential equations are also fundamental in the life sciences (reaction-diffusion equations) and economics (e.g. Black-Scholes equation). This module discusses these equations and methods for their solution. For example, for the heat and wave equation we discuss the method of separation of variables. This ties in with the remarkable result of Fourier that almost any periodic function can be represented as a sum of sines and cosines, called its Fourier series. An analogous representation for non-periodic functions is provided by the Fourier transform (and the closely related Laplace transform). We shall also discuss the the role of eigenvalue problems and some basic spectral theory, as well as fundamental solutions and associated Green's formulas. If time permits, we will cover some numerical methods.

Topics include:

- Second order ordinary differential equations, including non-constant coefficients
- Power series solutions
- Wave equation
- Laplace transform
- Complex functions (in particular contour integration, residues)
- Fourier transform, Fourier series

- Fourier analysis
- Separation of variables
- Heat equation
- Laplace and Poisson equation
- Green's function
- Polar and spherical coordinates
- Bessel functions
- Schrödinger equation

### **900323SCI Introduction to Financial Mathematics**

*Credit points*            6 *ecp*  
*Theme*                      ECS, LEU,  
*Track*                        Maths

#### *Prerequisites*

Linear Algebra, Vector Calculus and Probability and Statistics  
 (Prerequisites in 2013-14: Calculus 2)

#### *Course Content*

- Financial institutions trade in risk, and it is therefore essential to measure and control such risks. Financial instruments such as options play an important role in risk management, and to handle them one needs to be able to price them. This course gives an introduction into financial mathematics. The emphasis is on analysis, although the first few weeks a more stochastic approach is sketched.
- The following topics are treated:
  - introduction in the theory of options;
  - the binomial tree method;
  - introduction to Ito-calculus;
  - the Black-Scholes model;
  - the classical partial differential equations;
  - the Black-Scholes formula with applications;
  - American options and free boundary problems;
  - introduction to numerical methods for PDE's based on applications in financial mathematics.

### **900331SCI Nanoscience**

*Credit points*            6 *ecp*  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Physics

#### *Prerequisites*

Quantum Physics is the minimum prerequisite. Chemistry; Electrons, Waves, and Relativity; and Statistical Mechanics are recommended.

#### *Course description*

This course will focus on the emerging field of nanoscience. While not all of nanoscience is radical or new, the collection of topics under a single umbrella is a recent and useful initiative. At small length scales, the discreteness of matter and energy causes nano-structured materials' properties to diverge from those of the bulk. Purposeful nano-structuring of materials is currently finding applications in energy, electronics, and medicine. The course will explore physical attributes inherent in nano-structured systems, the current methods for

studying and creating nanomaterials, and a sample of research topics in nanoscience.

Split into three parts, the course will first investigate how the physics of nano-systems is different from macro-systems by studying current examples of nanotechnology. Second, the course will explore the advanced and varied techniques that enable the synthesis, analysis, and control of nanomaterials. The third part of the course will study new developments in nanoscience, allowing students to pursue their own interests in the field. Student papers and presentations will be written as if they are proponents (or possibly opponents) of their chosen technologies. Peer feedback should explore the associated uncertainties and risks. Several field trips to local research laboratories will be planned throughout the term. Issues of risk and public perception will also be explored.

### **900332SCI Symmetries and the Quantum Universe**

*Credit points* 6 ecp  
*Theme* ECS, LEU, HW, ICC  
*Track* Physics, Mathematics

#### *Prerequisites*

900233SCI Quantum Physics. 900131SCI 131 Electrons, Waves, and Relativity highly recommended.

#### *Course description*

Many natural systems such as snowflakes, molecules, and plants exhibit a high degree of symmetry. Symmetry reveals the internal structure of the system, and the possible ways it can interact with its environment. Finding the symmetries of a problem sometimes allows us to give a complete characterization of the system. This course introduces the student to a number of concepts and techniques in mathematical physics through the study of several physical systems. Differential equations, tensors, and space-time symmetries will be put to work through the relativistic Maxwell equations. The concept of spontaneously broken symmetry will be illustrated in superconductors. The symmetries of the hydrogen atom and the standard model of elementary particles will be exhibited. Particles with spin will be introduced using the Klein-Gordon and Dirac equations. Other special topics include scattering theory and systems of many particles. The course will alternate and combine student presentations, lectures, and projects.

### **900333SCI Condensed Matter Physics**

*Credit points* 6 ecp  
*Theme* ECS, LEU, HW, ICC  
*Track* Physics

#### *Prerequisites*

900233SCI Quantum Physics (Physics of Heat, strongly recommended)

#### *Course description*

For this course we leave the traditional path which starts with a geometric description of ideal crystal structures and scattering of X-rays and neutrons in such structures. Instead, we immediately consider electron tunnelling from atom to atom in condensed matter, a process which is independent of the exact arrangement of atoms. The basic theoretical ingredients are introduced by treating the simplest system, that of two protons and two electrons, i.e. the H<sub>2</sub>-

molecule. Already with this simple example we can understand qualitatively electron hopping, correlation effects and the occurrence of magnetism.

Evidently, a two atomic molecule is quite different from a solid containing approximately  $10^{23}$  atoms per  $\text{cm}^3$ . In order to explore the profound influence of a large number of atoms we consider a very long chain of atoms and discover that translation invariance can lead to the formation of energy bands separated by forbidden energy gaps. This plays a vital role in the description of metals, semiconductors and insulators.

The determination of electronic states in materials is only one ingredient of condensed matter physics. It is quite evident that in many-particle systems statistical physics is eminently needed. While electrons are described by Fermi-Dirac statistics, lattice vibrations (whose quanta are called phonons) obey Bose-Einstein statistics. In a certain sense, Physics of Condensed Matter is a marriage of Statistical Physics and Quantum Mechanics. It is a fascinating playground where various skills are required to understand the many facets of existing and future materials. It is also a playground full of surprises, some of the most spectacular being the discovery of high temperature superconductors (Nobel prize 1987) and of graphene (Nobel prize 2010). Both systems will be described in this course.

### **900341SCI Physical Biology of the Cell**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Physics, Biology

#### *Prerequisites*

900231SCI Physics of Heat or 900252SCI Molecular Cell Biology

#### *Course description*

This course provides insight in how the basic tools and knowledge of physics and mathematics can be used to better understand biology on the cellular and molecular level. Students will acquire knowledge and understanding to build quantitative models that provide a deeper insight in living systems.

#### Course content

- Mechanical and chemical equilibrium in the living cell
- Entropy
- Two-state Systems
- Random walks and the structure of Macromolecules
- Beam Theory: Architecture for Cells and Skeletons
- Biological Membranes: Life in Two dimensions
- The Mathematics of Water
- A Statistical View of Biological Dynamics
- Life in Crowded and Disordered Environments
- Rate Equations and Dynamics in the Cell
- Dynamics of Molecular Motors
- Biological Electricity and the Hodgkin-Huxley Model.

**900342SCI Innovative Drug Discovery**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Chemistry

*Prerequisites*

900242SCI Medicinal Chemistry

*Course description*

In the last decade, massive investments in life science research have resulted in unprecedented insights of the process that govern health and disease. This understanding, often on a detailed molecular level, is prompting the pharmaceutical sector to invent and utilize innovative research tool to capture the available data and use the knowledge in the design and development of the new generations of medicines. In this course, the latest developments and tools will be discussed and explored. In a combination of lectures, case studies and hands-on experiments, the challenges, successes and shortcomings of rational drug design and development will be exemplified. Topics include: structural biology of target molecules; the structure and properties of drug candidates; the energetics of ligand-receptor binding; current techniques for computational drug design, hit finding, intellectual property issues, lead optimization and finally the synthesis and production of medicines.

**900351SCI Epigenetic Regulations**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Biology, Biomedical Sciences

*Prerequisites*

Molecular Cell Biology

*Course description*

Advanced topics and recent developments in the field of epigenetic regulation with special emphasis on the role of epigenetics in various biological processes in human, animals, plants, fungi and bacteria. Further topics are: biochemistry and dynamics of DNA modification and chromatin modification (DM&CM) and of the role these epigenetic mechanisms have on gene expression and inheritance of traits.

**900361SCI Infectious Diseases**

*Credit points*            6 ecp  
*Theme*                      ECS, LEU, HW, ICC  
*Track*                        Biomedical Sciences

*Prerequisites*

900263SCI Immunology

*Course description*

The field of microbiology studies micro-organisms: bacteria, viruses and parasites. Medical microbiology comprised of bacteriology, virology and parasitology studies microbial pathogens that cause infectious diseases in the (human) host. During this course, the classification, replication, transmission and

detection of these pathogens will be studied, together with the presentation of on specific pathogens and their associated diseases that are currently threatening the human population.

Vaccination is a powerful tool to prevent infection. Several vaccination strategies, their outcomes, as well as current challenges will be discussed. E.g. why is there still no anti-HIV vaccine whilst the combat against polio was so easy? The textbook will be an important backbone of this course, while the purpose of the lectures is mainly to illustrate current microbiologic research and threatening infectious diseases while stimulating discussions on relevant questions in the field.

### **900362SCI Cancer Biology and Treatment**

*Credit points*            6 *ecp*  
*Theme*                      *ECS, LEU, HW, ICC*  
*Track*                        *Biomedical Sciences*

#### *Prerequisites*

900252SCI Molecular Cell Biology and 900263SCI Immunology

#### *Course description*

Cancer is a leading cause of death worldwide with an enormous impact on patients live and their surroundings. In this course we will start discussing the social and cultural meaning of cancer. We will look at population differences and the influence of genetics and several environmental factors on tumor development. Major oncology topics will be discussed during the lecture sessions, including;

- important molecular mechanisms and gene pathways involved in cancer development and maintenance,
- multi-step tumorigenesis,
- oncogenes and tumor suppressor genes,
- cell-cycle control,
- DNA integrity,
- apoptosis,
- invasion and metastasis,
- angiogenesis,
- Cancer Stem Cells.

Finally we will discuss already successfully used and possible future targets for therapy also concentrating on major ethical questions.

Current research developments on the discussed topics will be integrated in the programme doing journal clubs and research debates. During the course students will work on a research project and get the chance to interact with young researchers currently working within the cancer research field.

### **900363SCI Cardiovascular Diseases**

*Credit points*            6 *ecp*  
*Theme*                      *ECS, LEU, HW, ICC*  
*Track*                        *Biomedical Sciences*

#### *Prerequisites*

900252SCI Molecular Cell Biology



### *Course description*

Cardiovascular diseases including heart failure and stroke are among the main causes of death in the Western world. Their incidences are still rising due to the aging of the population, obesity and, paradoxically, the successful treatment of acute myocardial infarction and cardiac arrhythmia. The aim of the course is to give the students a thorough understanding of the pathomechanisms involved in cardiovascular diseases and to provide insight in the current state of affairs and future prospects of prevention, diagnosis and treatment of cardiovascular diseases.

Starting from basic cellular processes, various aspects of cardiac and vascular function at the organ level in health and disease will be covered. The impact of lifestyle, diet, sports and genetics are discussed. Major health issues related to obesity, diabetes, chronic inflammation, sepsis and shock will be discussed, as well as the impact and pharmacokinetics of several of the major drug classes, like beta blockers, diuretics, statins, warfarin and aspirin.

### **900364SCI Neurosciences**

<i>Credit points</i>	<i>6 ecp</i>
<i>Theme</i>	<i>ECS, LEU, HW, ICC</i>
<i>Track</i>	<i>Biomedical Sciences</i>

### *Prerequisites*

900161SCI The Human Body I and one of the following courses: 900264SCI Brain and Cognition (highly recommended) or 900252SCI Molecular Cell Biology or 900261SCI Human Body II

### *Course description*

The human nervous system governs all aspects of our cognition and behaviour. Look around yourself and marvel at the brains accomplishments. From language to music to machine, it all bears witness to the bewildering functional complexity of the nervous system. How does it work? In the Neurosciences course our aim is to provide students with a fundamental understanding of how the brain works. In addition, we focus on a second compelling reason to know more about the nervous system, which is the need to understand how malfunctions lead to neurologic and psychiatric disease. Emphasis will lie on studying the normal function of the brain, but modern scientific and clinical demands make it mandatory that we explore ways to translate fundamental experimental knowledge to clinical practice. Therefore, the clinical implications and opportunities for translational research will be discussed for selected subjects.

The course has a strongly neurobiological character. We will study the organization and function of the nervous system by looking at the molecular and cellular components that constitute the nervous system and the way neural cells are organized in neural circuits which, in turn, make up neural systems that process similar kinds of information, i.e. the sensory, motor and associational systems. The associational system is particularly intriguing since it mediates the most complex functions. It will become clear how we can study the brain's physiology and pathophysiology using structural, functional and behavioural analyses. Modern research in mental health requires the study of specific cognitive and affective domains across different diseases. To illustrate such an integrated approach we will apply experimental physiological findings to the pathophysiology of at least two disorders, viz. Parkinson's disease and Addiction. We will use a textbook supplemented by original research papers. The textbook includes excellent brain atlas software which will be used to prepare for a neuroanatomical practical in which we will dissect the human brain. Students will

be required to present (parts of) book chapters or additional reading and to initiate and moderate discussion of the above literature or other study assignments.

### **900365SCI Mechanisms of Disease**

*Credit points*            6 *ecp*  
*Theme*                      *HW*  
*Track*                        *Biomedical Sciences*

#### *Prerequisites*

900261SCI The Human Body II, Introduction to Health and Wellbeing theme course.

#### *Course description*

The aim of the course is to provide an introduction to the relations and mechanisms between normal function (physiology) and disease (pathophysiology), illustrated by the following topics;

1. general paediatrics: growth and development
2. heart and blood vessels
3. kidney
4. liver
5. reproductive system and endocrine glands
6. Haematology, infectious diseases and immunology
7. Respiratory system
8. The newborn
9. Paediatric Intensive Care
10. Translational genetics
11. Oncology
12. Evidence based medicine

The course will be given every Wednesday afternoon. Each module will deal with the problems of a specific organ system. On top of this, a course on epidemiology and Evidence Base Medicine is integrated.

Most of the modules have the following format:

1. Patient presentation (30 minutes)
2. Introduction lecture: how does the organ/system work (physiology), what causes hampering of its function (determinants of disease) and to what does that lead (pathophysiology and impact of the disease). Groups presentations (80 minutes)
3. "State of the art" lecture (25 minutes).
4. Demonstration of clinical "tools" (30 minutes).

During each module, the participating students will receive assignments for a planned patient contact and self-study program directed to a better understanding of disease mechanisms concerning the specific organ system. During the course, in addition to gaining knowledge on the relation between physiology and pathophysiology, the students, through contact with selected patients, will have an opportunity to understand the diagnostic, therapeutic, psychological and social consequences of disease, with reference to previous courses (The Human Body and Introduction to Health and Wellbeing).

### **900371SCI/SSC Addiction**

*Credit points*            6 *ecp*  
*Theme*                        *ECS, LEU, HW, ICC*

Track

Health, Biomedical Sciences

*Prerequisites*

900264SCI Brain and Cognition or 900242SCI Medicinal Chemistry

*Course description*

The goal of this course is to gain insight into the etiology and the neurobiology of addictive behavior. The course explores various topics in the study of drug addiction. The primary emphasis is on psychological and biological theories of drug addiction. Genetic and personality traits representing risk factors for the development of addiction will be identified. Other important topics are clinical diagnosis and treatment. Psychomotor stimulant (e.g. amphetamine, cocaine) and opiate (e.g. heroin, morphine) drugs, but also the more socially accepted drugs nicotine and alcohol, figure prominently in an examination of the pharmacological properties of addictive drugs. Much of the course relates the important mood-elevating effects of these drugs to their biological actions. However, non-drug related addictions, such as gambling and obsessive eating will also be discussed. We will also address the huge impact of addiction on our society and the effectiveness of drug policies.

**900373SCI/SSC    Human Stress Research**

*Credit points*

6 ecp

*Theme*

ECS, LEU, HW, ICC

*Track*

Biomedical Sciences, Health

*Prerequisites*

200 level course in Health, Biology and Biomedical track

*Course description*

'Stress' is one of the most intriguing phenomena that affects our life as it is today. At the same time, however, do we know what we are talking about? There is no other word in the Anglo-Saxon language that is so ill-defined, or has so many meanings as the word 'stress'.

Usually, when we talk about stress, we mean that life is weighing heavy upon us. Stress is imbalance. Scientifically, when we talk about stress, we talk about the (psychobiological) stress response and stressors (stimuli) that are able to elicit a stress response. In this way, stress is conceptualized as a positive force that enables us to learn from encounters and adapt to our environment, only being disruptive when for one reason or the other our coping skills fail and our stress response becomes inadequate: without stress there is no life; with too much stress life becomes miserable!

The present course provides insight into today's concepts of stress, the (psycho)biological mechanisms underlying the human stress response, the autonomous nervous system, the neuro-endocrine pathways and the immune system, and its impact on health and disease. The disease context is illustrated by discussing depression as a chronic stress syndrome, the post-traumatic stress disorder as a worn out disease and the conduct disorder as a cold-hearted condition. Prudent steps towards new treatment strategies will be highlighted.

**900381SCI/SSC    Introduction to GIS**

*Credit points*

6 ecp

*Theme*

ECS, LEU, HW, ICC, SS

*Track* *Earth&Environment (SCI); Env. Economics(SSC)*

*Prerequisites*

900122ACC Calculus I or 900121ACC Basic Research Methods and Statistics, course exclusively for 300 level SCI/SSC students

*Course description*

This course provides an overview of the theory and practice of utilizing Geographic Information Sciences (GIS) as a method for analysis of environmental problems. The course applications are primarily directed to the natural sciences, but the techniques are also appropriate for the social sciences (such as urban planning). Lectures will emphasize general principles and theory in GIS, and the nature of geospatial data systems. Labs will be oriented towards concepts discussed in class by employing *ArcGIS* and related software packages to the display and analysis of geospatial data. Specific topics to include overview of geospatial technologies; geodetic datums, projections, and coordinate systems; vector and raster data structures; attribute and relational databases; spatial analysis (e.g., map algebra), and spatial modelling. Format: lecture at AUC and computer laboratory. Students are expected to complete a final project on an approved topic.

**900382SCI Paleoclimatology**

*Credit points* *6 ecp*  
*Theme* *ECS, LEU, HW, ICC*  
*Track* *Earth & Environment*

*Prerequisites*

900121SCI Introduction to Geological Sciences and at least one 200 level course Earth/Environment track.

*Course description*

Paleoclimatology is an integrative discipline within the geosciences that aims to link past climate change with rates and patterns of environmental change. This course provides an overview of the multiple approaches utilized in climate reconstruction over the Quaternary (last ~2.5 million years). The focus is on the analysis of key environmental proxies, including some combination of Quaternary paleoclimatology, paleoecology, stratigraphy and pedology, radiometric dating, and paleohydrology. The class is to include laboratory, field, and computer modelling exercises as appropriate for the topic.

**900383SCI Earth's Cycles**

*Credit points* *6 ecp*  
*Theme* *ECS, LEU, HW, ICC*  
*Track* *Earth & Environment*

*Prerequisites*

System Earth

*Course description*

This course discusses the different geological and biochemical cycles which shape our planet. Topics may include: global cycles of carbon, nitrogen and sulphur. Photosynthesis, respiration and net primary production. Soil formation, erosion and carbon storage. Ecosystem processes, metrics and function. Nutrient supply and limitation. Microbial processes underlying weathering, decomposition and

carbon remineralisation. Stable isotope tracers in the carbon and hydrologic cycles. The human footprint on the earth.

### **900393SCI Modelling Real World Problems**

*Credit points*            6 *ecp*  
*Theme*                    *ECS, LEU, HW, ICC*  
*Track*                     *Information Sciences*

#### *Prerequisites*

900121ACC Basic Research Methods and Statistics or 900122ACC Calculus I; exclusively for 300 level SCI/SSC students

#### *Course description*

This course will focus on modelling real world phenomena ranging from biological to social networks. After an overview of modelling and simulation as the third paradigm of science, we introduce Network Science and apply it to model social and biological phenomena. Examples of this are friend and contact networks on the Web, or how to infectious diseases such as influenza move through society.

#### Topics:

- 3<sup>rd</sup> paradigm of science, modelling and simulation
- Networks (technological, social, information, biological)
- Mathematics and Networks
- Fundamental network algorithms
- Modelling networks (preferential attachment, vertex copying)
- Modelling with networks (percolation, epidemics, social relations)

### **900394SCI Text Mining and Collective Intelligence**

*Credit points*            6 *ecp*  
*Theme*                     *ICC*  
*Track*                     *Information Sciences*

#### *Prerequisites*

Machine Learning

#### *Course description*

This course provides an introduction to recommendation algorithms, along with the principles underlying Web 2.0, collective intelligence and Python. Students will learn to solve basic recommendation problems using collective intelligence resources. The increasing amount of textual information available online contains a wealth of knowledge about topics, people, products and behaviour. Due to its numerous applications (scientific, commercial, non-profit), uncovering this knowledge is an important task. The course will offer an introduction to recommendation algorithms and put the core ideas to work using Web 2.0 data. The course will identify the need for machine learning techniques that allow us to make inferences and predictions about user experiences, marketing and human behaviour from the information that is generated and collected daily.

### **900395SCI Intelligent Systems**

*Credit points*            6 *ecp*  
*Theme*                     *ICC*  
*Track*                     *Information Sciences*

*Prerequisites*

Machine Learning

*Course description*

Students are able to understand and evaluate signal processing methodologies for various sensory modalities and their relation to human perception. They acquire a basic knowledge of machine perception and are able to apply machine perception methods in relation to human perception.

This course provides an introduction to sensory information processing for machines. It covers visual, audio, language, and haptic perception for artificial systems. The course provides the fundamental signal processing background, mainstream machine learning methodologies, and the background and analogies for human perception. Programming exercises will use Python.

Topics include:

- Perception basics for visual, audio, speech, and haptic perception
- Representation of sensory information
- Receptive field measurements
- Linear and Fourier theory
- Invariant transformations
- Combining information streams
- Error and uncertainty propagation
- Machine learning principles for sensory information processing
- Experimental evaluation and design

**900396SCI Life-style Informatics**

*Credit points*                      6 *ecp*

*Theme*                                      ICC

*Track*                                        Information Sciences

*Prerequisites*

None

*Course description*

The course focuses on the processes that underlie human behaviour in everyday situations from two different research perspectives: empirical work and computational modelling. The combination of these two perspectives allows for a better understanding of cognitive and affective human behaviour and opens up possibility to support humans in improving their lifestyle. This course addresses different aspects of modelling human behaviour in psychological, biomedical and social settings. Methodological aspects of modelling are discussed, such as the collection and specification of relevant data and knowledge, defining ontologies, the development of simulation experiments, and the validation of the created models. Attention is also paid to substantive aspects of dynamic modelling methods, such as causal relations and causal graphs, executable specifications, differences between qualitative and quantitative modelling, and the integration of qualitative and quantitative modelling. All these aspects are used in assignments involving relatively simple dynamic models made of everyday processes such doing sports, taking medicine or driving a car.

- 900301CIC Capstone**
- 900302CIC Capstone Internship**
- 900303CIC Internship**
- 900304CIC Community Project**
- 900310CIC Second Internship**