UNIVERSITY OF SZEGED, ALBERT SZENT-GYÖRGYI MEDICAL SCHOOL
DOCTORAL SCHOOL OF CLINICAL MEDICINE

Training Plan, with course discriptions
for Full-Time (2+2-Year) Doctoral Training

1. ACADEMIC REQUIREMENTS

1.1. GENERAL REGULATIONS

1.2. MODULES

The training plan consists of four modules:

Module 1: Educational / Course Credits (minimum 38 credits) — KODI-1

Module I/A.: Basic (obligatory) PhD courses

I/A Basic (obligatory) PhD courses (20 credits) AOKDI-ALA. (during the first to forth semesters.)													
Course name	**Name of department coordinator**	**Total number of hours**	**Requirements**	**Number of credits in the given semester**								**Total number of credits**	**Form of evaluation**
				1.	**2.**	**3**	**4**	**5.**	**6.**	**7.**	**8.**		
Computer-assisted research methodology AOKDI-BAS-01	Department of Medical Physics and Informatics Prof. Dr. Ferenc Peták, DSc	28	C*	**6**	-	-	-	-	-	-	-	**6**	E5
Biostatistics Lecture AOKDI-BAS-03	Department of Medical Physics and Informatics Prof. Dr. Tibor Nyári, DSc	28	C*	**6**	-	-	-	-	-	-		**6**	E5
Biostatistics Practice AOKDI-BAS-04	Department of Medical Physics and Informatics Prof. Dr. Tibor Nyári, DSc	20	C*	**2**	-	-	-	-	-	-	-	**2**	E3
Scientific communication and publication. Methods, rules, and ethics. AOKDI-BAS-02	Department of Medical Biology Prof. Dr. Ernő Duda, DSc	14	C*	-	**3**	-	-	-	-	-	-	**3**	E5
Biomedical Ethics AOKDI-BAS-05	Department of Behavioral Sciences Dr. Kelemen Oguz, Habil. PhD	14	C*	-	**3**	-	-	-	-	-	-	**3**	E5
The total No. of credits in Basic Module 1/a				**14**	**6**	**-**	**-**	**-**	**-**	**-**	**-**	**20**	

*C (Compulsory subject)

The announcement of basic courses may change each semester. Information about the courses announced in the current semester is available in Neptun System, during the course registration period. The courses are announced by the responsible lecturers and/or their departments at the beginning of the semester.

Informing students on course requirements
(In accordance with information and study materials available on CooSpace)
From Februar 2025

Program: PhD day- training for SH students and self-cost students
Course: **Computer-assisted research methodology**
Academic year/Semester: **2024/25 2nd semester**
Educator and contact details (e-mail): **Prof. Ferenc Peták, email: petak.ferenc@med.u-szeged.hu** **Dr. József Tolnai, email: tolnai.jozsef@med.u-szeged.hu**
Type of course: lecture/**seminar**/**practice**/laboratory
Weekly hours of the course: **2**
Credit value of the course: **6**
Type of examination: **final exam at the end of semester**, practice exam, other:-
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): **none**
Purpose of the course: The primary aim of the course is to provide PhD students with a practical and theoretical background in computer science for the process from data analysis to publication. The course aims to educate students on the use of modern information technologies for effective work in life sciences: processing biomedical data, creating scientific charts and diagrams, preparing and presenting presentations, composing electronic documents (e.g. publications, theses) and surveys. The course also aims to provide insights into new and expanding medical technologies such as telemedicine systems, medical applications of 3D design and printing, and artificial intelligence in life sciences.
Outcome requirements of the course (specific academic results to be established by the course): Knowledge: • Possesses the knowledge needed to process biomedical data into tables. • Being familiar with the basic concepts of spreadsheets (relative, absolute, and mixed references, ranges, data import and input, data validation, autofill, charts, filtering, sorting, diagrams, functions, basic statistical solutions, large tables, linear regression, and pivot tables) • Knows the effective and modern presentation techniques and principles of presentation. Familiar with interactive and none-slide based presentation tools (Prezi, Mentimeter) • Knows the health data available on the web. Also familiar with the methods of preparing and evaluating online forms. • Knows the basic typographic concepts for document editing (styles, table of contents, figures and captions, list of figures), and general document editing principles. Understands the use and benefits of reference management software. • Being familiar with forms and basic concepts of scientific data publication. Knows the information and literature search, and the international scientific life science databases. Competences:

- Having the skill to solve tasks on health data in a spreadsheet program. Creates charts, graphs, and pivot tables. Sort and filter data. Apply mathematical and statistical functions.
- Able to create appropriate presentations with animations not only in standard slide-based but also in virtual canvas-based and interactive presentation software.
- Able to find data in open health databases. Capable of creating, sharing, and evaluating online forms.
- Creates, modifies, and applies styles in a word processor, inserts figures and captions, generates table of contents and list of figures, creates a bibliography, manages cross-references, and footnotes.
- Able to use basic telemedicine tools, artificial intelligence and 3D printing techniques in the field of medicine.

Attitudes:

- Confidently apply the spreadsheet techniques they have learned. Strives to maintain data integrity, process, and present data accurately.
- Open to the use of familiar presentation techniques and strives to produce consistent-looking, easy-to-follow presentations.
- Confidently perform search and retrieval tasks from open health databases. Confidently create online questionnaires.
- Strives to apply typographic principles to the production of sophisticated and easy-to-follow electronic and paper-based documents.
- Open to telemedicine applications for the use and development of tools.
- Open to the use of artificial intelligence and 3D printing tools to support medical research.

Autonomy and responsibility:

- Independently solve the spreadsheet and data processing tasks arising in his/her profession.
- Creates and presents his/her electronic presentations independently.
- Autonomously solve the search for open biomedical data.
- Independently create and evaluate online questionnaires.
- Solves word processing and document management tasks independently.
- Independently can interpret the basic concepts of telemedicine, biomedical applications of artificial intelligence, and 3D printing

Topics:

General information, syllabus of the seminars, requirements, IT environment. Basic concepts of computer data collection, representation and processing of measurement data in life sciences.

Computer-assisted data processing methods. Evaluation of medical data with spreadsheets: importing data, input and data validation, references, calculations, functions, filtering, sorting, diagrams, basic statistical solutions, large tables, linear regression, and pivot tables.

Forms and basic concepts of scientific data publication. Presentation of evaluated data, use of graphical software packages (SigmaPlot).

Content and form requirements for scientific presentations. Relationship between design, structure, content and message. Creating scientific presentation: traditional slide-based presentation with PowerPoint, virtual canvas and zooming interface in Prezi, interactive presentation with Mentimeter, PechaKucha

Document processing, use of styles, table of contents, figures and captions, list of figures. Advanced document editing (header, footer, footnote, endnote, cross reference, references), reference management with EndNote, creating online medical surveys and forms.

How do we use artificial intelligence and 3D printing in life sciences?

Information and literature search, use of international scientific life science databases. Electronic systems for managing scientific publications. Reference manager.

Supporting methods to achieve learning outcomes:

Teaching methods:

The practices are done as frontal work (projected task solution, explanation, questioning, discussion) followed by individual or group work.

We help students with their personalized learning using practical handouts and self-developed e-learning materials uploaded to CooSpace.

Students participating in the course will get homework related to topics covered in the seminars to receive bonus points in the final exam.

Evaluation of the acquisition of expected learning outcomes:

Requirements:

- active participation in seminars
- preparation and submission of homework and examination documents by the deadline

Assessment of acquired skills and competences:

The assessment for the semester is graded with a practical mark which depends on the results of the mid-term and end-of-semester tasks.

Maximum number of points you can get for the exam: 200
Maximum points for mid-semester homework: 100
Total points that can be collected: 300
Attendance at seminars will be honored with additional bonus points.
Grades of the course are determined as follows:

0 - 139 points: failed (1)
140 - 179 points: passed (2)
180 - 219 points: accepted (3)
220 - 259 points: good (4)
260 - 300 points: excellent (5)

Mandatory and recommended reading list:

All handouts for the seminars will be available on the CooSpace scene.

Indicating course requirements on CooSpace scene (summary)

Description (public):

The primary aim of the course is to provide PhD students with a practical and theoretical background in computer science for the process from data analysis to publication.

The course aims to educate students on the use of modern information technologies for effective work in life sciences: processing biomedical data, creating scientific charts and diagrams, preparing and presenting presentations, composing electronic documents (e.g. publications, theses) and surveys.

The course also aims to provide insights into new and expanding medical technologies such as telemedicine systems, medical applications of 3D design and printing, and artificial intelligence in life sciences.

Requirements:

- active participation in seminars
- preparation and submission of homework and examination documents by the deadline

Assessment of acquired skills and competences:

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Topics:

General information, syllabus of the seminars, requirements, IT environment. Basic concepts of computer data collection, representation and processing of measurement data in life sciences.

Computer-assisted data processing methods. Evaluation of medical data with spreadsheets: importing data, input and data validation, references, calculations, functions, filtering, sorting, diagrams, basic statistical solutions, large tables, linear regression, and pivot tables.

Forms and basic concepts of scientific data publication. Presentation of evaluated data, use of graphical software packages (SigmaPlot).

Content and form requirements for scientific presentations. Relationship between design, structure, content and message. Creating scientific presentation: traditional slide-based presentation with PowerPoint, virtual canvas and zooming interface in Prezi, interactive presentation with Mentimeter, PechaKucha

Document processing, use of styles, table of contents, figures and captions, list of figures. Advanced document editing (header, footer, footnote, endnote, cross reference, references), reference management with EndNote, creating online medical surveys and forms.

How do we use artificial intelligence in life sciences?

Information and literature search, use of international scientific life science databases. Electronic systems for managing scientific publications. Reference manager.

Informing students on course requirements
(In accordance with information and study materials available on CooSpace)
From Februar 2025

Program: PhD day- training for SH students and self-cost students
Course: **Scientific communication and publication. Methods, rules, ethics.**
Academic year/Semester: **2024/2025, 2nd.**
Educator and contact details (e-mail): **Prof. Dr. Ernő Duda DSc, duda@brc.hu**
Type of course: **lecture**/seminar/practice/laboratory Lectures Exam date:
Weekly hours of the course: **1** (14 hours)
Credit vale of the course: **3**
Type of examination**:** final exam at the end of semester, practice exam, other: final written exam at the end of semester (brief answer questions)
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): **none** (be a PhD student)
Purpose of course: To help students to navigate in the (natural) sciences of 21st century. Planning, execution, documentation of experiments. Reproducibility, significance of results. Ways and tools of scientific communication. Posters, oral presentations, publications, PhD theses, chapters, book, patents. Open science, open access, blockchain in science. Peer review, predatory journals, impact of publications.
Outcome requirements of the course (specific academic results to be established by the course): The students should know how to plan and evaluate experiments, how to tell if the results are reproducible, how to document their results, how to communicate their research, how to write a scientific paper, a PhD thesis, when to contact a legal expert to file patents. They should know where to look for information concerning legal requirements, financial regulations, how to participate in (international) collaborations, how to form consortia, where to find scientific courses, calls for scientific proposals, how and when to use AI.
Topics: **Data mining** Big data – structured and unstructured big data Extract data from websites, applications, spreadsheets, IT infrastructure, emails and more

Interpret diverse file naming conversions
Check data for completeness and accuracy
Transform unstructured data automatically into easily digestible reports, tables, or files
Move data and files securely to different locations and users with file transfer automation

AI
Artificial intelligence in medical diagnosis
Artificial Intelligence in Medical Epidemiology
AI in medical (pharmaceutical) research and discovery
Informed, strategic decision making
Natural Language Processing
Machine learning
Deep structured or „hierarchical" learning

Meta analysis
Purpose of the research
Working plan, hypothesis
Sample collection, data base
Analysis, validation
Comparison with reference data
Results, publication

Science in the 21st century
Civilisation, religion, empirical science
Ancient science, medieval science, development of experimental sciences
Industrial revolution, modern science, trends in the 20th and 21st century
Forms and rules of scientific communication
Scientific literature, databases, impact, citations

Scientific career
Phases of the scientific career
Requirements of success in different phases
World science, collaborations, networks
Your proposals, your project, your own team
Know your skills and talents!
Different paths after PhD

Challenges in the 21st century
Irreproducible research: mistakes, fabrications, plagiarism
Plagiarism-detecting software, corrections, retractions
Digital age: OCRID, scientist with a number, contribution to a publication
Open access: price, importance, advantages and complications, publication of negative results
Open access journals, predator journals
Electronic notebooks, patents or blockchain?
Death of IF

Supporting methods to achieve learning outcomes:
Convincing lectures

Evaluation of the acquisition of expected learning outcomes:
Evaluation well be in accordance with the purposes and requirements of the course:
written exam at the end of the lectures.

Mandatory reading list:
none

Recommended reading list:
none

Indicating course requirements on CooSpace scene (summary)

Description (public): The course deals with communication and publication of results of experimental sciences. From planning the experiment to the publication of results and discoveries. Forms, means and ways of correct scientific communication will be discussed.
Requirements: Be familiar with all rules, regulations, tools and techniques of scientific communication, know about the challenges of current times.
Topics: Big data, data bases, data mining, IT infrastructure Artificial intelligence in diagnosis, research and discovery Machine learning, „hierarchical" learning Meta analysis Forms and rules of scientific communication Scientific career World science, collaborations, networks Publications, success, and challenges in the 21st century

Informing students on course requirements
(In accordance with information and study materials available on CooSpace)
Most nem indult, jövőre tudják felvenni a hallgatók
From September 2025

Program: Ph.D. day- training for SH students and self-cost students

Course: **Biostatistics lecture**

Academic year/Semester: *2025/26 1st semester*

Educator and contact details (e-mail):
Stéhlik Jánosné Dr. Boda Krisztina boda.krisztina@med.u-szeged.hu
Dr. Nyári Tibor nyari.tibor@med.u-szeged.hu
Szűcs Mónika szucs.monika@med.u-szeged.hu

Type of course: **lecture**/seminar/practice/laboratory

Weekly hours of the course: 2

Credit value of the course: 6

Type of examination: final exam at the end of semester, practice exam, other:……..

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course):

Purpose of the course:

The aim of this course is to familiarize students with the most commonly used statistical methods in the clinical and research fields of medicine, enabling them to apply these methods. Students will also learn to correctly interpret statistical results from statistical software or medical articles.

Throughout the course, students will learn the concepts of data and databases. They will be able to formulate hypotheses specific to a given experimental design, create the necessary database, determine the types of variables within the database, and describe their distribution.

Students will become familiar with the methods of hypothesis testing commonly used in medical research and with the fundamentals of statistical modeling. They will learn how to select appropriate statistical methods to test hypotheses, run statistical analyzes using statistical programs, and draw appropriate statistical and medical conclusions based on the results, interpreting them according to industry standards. In addition, they will learn when it is necessary to involve a statistician in the research process.

Topics:

1. **Introduction. Data description.**
   Types of data, display of data. Sample characteristics. Categorical and continuous variables, absolute and relative frequency, bar chart, pie chart, histogram; mean, median, mode, range, quartiles, variance, standard deviation, mean-error chart, box diagram). Population, sample.
2. **Basics of Probability Theory I.**
   The concept of probability, rules of probability calculus. Odds, odds ratio. Definition of a categorical variable, the distribution, expected value, and variance of a categorical variable. Special discrete distributions: the binomial and Poisson distributions.
3. **Basics of Probability Theory II.**
   Conditional probability, diagnostic tests. The distribution of continuous variables, the density function. The normal distribution. Standardization, the binomial test as an application of standardization.
4. **Statistical estimation.**
   The central limit theorem; the standard error of the mean. The concept of a confidence interval. Confidence interval for the odds ratio. Confidence interval for the population mean. The t-distribution, the use of Student's t-table. Hypothesis tests: one sample t-test, binomial test.
5. **Statistical inference, t-tests**
   One sample, paired, and independent samples t-test. Comparison of variances (F-test). One- and two-tailed tests.
6. **Correlation-regression analysis.**
   Single and multiple linear regression. Linear regression on transformed data.
7. **The chi-square test for independence**
   Assumptions, Fisher exact test
8. **Statistical errors**
   Type I and II errors, statistical power. The basics of sample size calculation
9. **Analysis of variance**
   Principle of one-way ANOVA, F-test, pairwise comparisons. Repeated measurements ANOVA.
10. **Nonparametric methods based on ranks**
    Wilcoxon-test, Mann-Whitney test, Kruskal-Wallis test
11. **2x2 tables in epidemiology**
    Cohen-Kappa, relative risk, odds ratio, logistic regression.
12. **Survival analysis**
    Life-table, Kaplan-Meier method
13. **Multivariate methods**
    Factor analysis, cluster analysis, discriminant analysis. The aim and most important properties.

Supporting methods to achieve learning outcomes:

Teaching methods:

In addition to giving theoretical background, we give practical examples based on medical and biological research papers to show the application of the methods in practice.

Requirements:

The final grade is determined on the total score, where the total score is the sum of the points obtained in practice and the final exam.

The grades are awarded as follows on the total score:

0 - 101.99 points: Fail (1)
102 - 125.99 points: Pass (2)
126 – 151.99 points: Average (3)
152 – 175.99 points: Good (4)
176 - : Excellent (5)

Exam Test

Exams are held in the classrooms of the Small Educational Building in the form of a CooSpace test. The tests cover the entire semester's practical and theoretical material, with a special focus on the use of statistical software. auxiliary materials are not allowed during the exam.

To register for the exam, students must register through the Neptun system, and registration will automatically close 24 hours before the exam begins.

The duration of the exam test is 40 minutes, and a maximum of 100 points can be earned.

Mandatory reading list:

Students can download course material (handouts, lecture notes) from Coospace. Making notes at lectures will help in preparing for the exam.

Recommended reading list:

- Michael J. Campbell – David Machin – Stephen J. Walters: Medical Statistics. A Textbook for the Health Sciences (2012) ISBN: 978-1-118-30061-9
- Internet resources:
  Khan Academy: https://www.khanacademy.org/math/statistics-probability
  Crash Course (Statistics): https://www.youtube.com/playlist?list=PL8dPuuaLjXtNM_Y-bUAhblSAdWRnmBUcr
  Rice Virtual Lab in Statistics: http://onlinestatbook.com/rvls.html
- Reiczigel Jenő – Harnos Andrea – Solymosi Norbert: Biostatisztika nem statisztikusoknak (2014). Pars Kft. ISBN: 978-963-06-3736-7 (In Hungarian)
- E-learning (in Hungarian): http://eta.bibl.u-szeged.hu/view/creators/Sz==0171cs=3AM=F3nika=3A=3A.html

Indicating course requirements on CooSpace scene (summary)

Description (public):

The aim of this course is to familiarize students with the most commonly used statistical methods in the clinical and research fields of medicine, enabling them to apply these methods. Students will also learn to correctly interpret statistical results from statistical software or medical articles.

Throughout the course, students will learn the concepts of data and databases. They will be able to formulate hypotheses specific to a given experimental design, create the necessary database, determine the types of variables within the database, and describe their distribution.

Students will become familiar with the methods of hypothesis testing commonly used in medical research and with the fundamentals of statistical modeling. They will learn how to select appropriate statistical methods to test hypotheses, run statistical analyzes using statistical programs, and draw appropriate statistical and medical conclusions based on the results, interpreting them according to industry standards. In addition, they will learn when it is necessary to involve a statistician in the research process.

Requirements:

Attendance of lectures is strongly recommended; downloading lecture slides cannot substitute for participation in the lecture. The course ends with an end-semester examination.

The lectures are complemented by a practical course whose aim is to help students reach a deeper understanding of the lecture material.

Examination Requirements

Students who do not meet the course requirements cannot take the examination.

The final grade is determined on the total score, where the total score is the sum of the points obtained in practice and the final exam.

The grades are awarded as follows on the total score:

0 - 101.99 points: Fail (1)
102 - 125.99 points: Pass (2)
126 – 151.99 points: Average (3)
152 – 175.99 points: Good (4)
176 - Excellent (5)

Exam Test

Exams are held in the classrooms of the Small Educational Building in the form of a CooSpace test. The tests cover the entire semester's practical and theoretical material, with a special focus on the use of statistical software. auxiliary materials are not allowed during the exam.

To register for the exam, students must register through the Neptun system, and registration will automatically close 24 hours before the exam begins.

The duration of the exam test is 40 minutes, and a maximum of 100 points can be earned.

Topics:

1. **Introduction. Data description.**
   Types of data, display of data. Sample characteristics. Categorical and continuous variables, absolute and relative frequency, bar chart, pie chart, histogram; mean, median, mode, range, quartiles, variance, standard deviation, mean-error chart, box diagram). Population, sample.
2. **Basics of Probability Theory I.**
   The concept of probability, rules of probability calculus. Odds, odds ratio. Definition of a categorical variable, the distribution, expected value, and variance of a categorical variable. Special discrete distributions: the binomial and Poisson distributions.
3. **Basics of Probability Theory II.**
   Conditional probability, diagnostic tests. The distribution of continuous variables, the density function. The normal distribution. Standardization, the binomial test as an application of standardization.
4. **Statistical estimation.**
   The central limit theorem; the standard error of the mean. The concept of a confidence interval. Confidence interval for the odds ratio. Confidence interval for the population mean. The t-distribution, the use of Student’s t-table. Hypothesis tests: one sample t-test, binomial test.
5. **Statistical inference, t-tests**
   One sample, paired, and independent samples t-test. Comparison of variances (F-test). One- and two-tailed tests.
6. **Correlation-regression analysis.**
   Single and multiple linear regression. Linear regression on transformed data.
7. **The chi-square test for independence**
   Assumptions, Fisher exact test
8. **Statistical errors**
   Type I and II errors, statistical power. The basics of sample size calculation
9. **Analysis of variance**

Principle of one-way ANOVA, F-test, pairwise comparisons. Repeated measurements ANOVA.

10. **Nonparametric methods based on ranks**
    Wilcoxon-test, Mann-Whitney test, Kruskal-Wallis test
11. **2x2 tables in epidemiology**
    Cohen-Kappa, relative risk, odds ratio, logistic regression.
12. **Survival analysis**
    Life-table, Kaplan-Meier method
13. **Multivariate methods**
    Factor analysis, cluster analysis, discriminant analysis. The aim and most important properties.

Course description template
Informing students on course requirements
(In accordance with information and study materials available on CooSpace)
From September 2025
Most nem indult, jövőre tudják felvenni a hallgatók

Program: PhD day- training for SH students and self-cost students

Course**: Biostatistic practice**

Academic year/Semester: 2025/26 1st semester

Educator and contact details (e-mail):
Stéhlik Jánosné Dr. Boda Krisztina boda.krisztina@med.u-szeged.hu
Dr. Nyári Tibor nyari.tibor@med.u-szeged.hu
Szűcs Mónika szucs.monika@med.u-szeged.hu

Type of course: lecture/seminar/practice/laboratory

Weekly hours of the course: 2

Credit vale of the course: **2**

Type of examination: final exam at the end of semester, practice exam, other: **three-level acceptance**

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): not

Purpose of course:

The aim of this course is to familiarize students with the most commonly used statistical methods in the clinical and research fields of medicine, enabling them to apply these methods. Students will also learn to correctly interpret statistical results from statistical software or medical articles.

Throughout the course, students will learn the concepts of data and databases. They will be able to formulate hypotheses specific to a given experimental design, create the necessary database, determine the types of variables within the database, and describe their distribution.

Students will become familiar with the methods of hypothesis testing commonly used in medical research and with the fundamentals of statistical modeling. They will learn how to select appropriate statistical methods to test hypotheses, run statistical analyzes using statistical programs, and draw appropriate statistical and medical conclusions based on the results, interpreting them according to industry standards. In addition, they will learn when it is necessary to involve a statistician in the research process.

Outcome requirements of the course (specific academic results to be established by the course):

Topics:

1. **Introduction. Data description.**
   Types of data, display of data. Sample characteristics. Categorical and continuous variables, absolute and relative frequency, bar chart, pie chart, histogram; mean, median, mode, range, quartiles, variance, standard deviation, mean-error chart, box diagram). Population, sample.
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   Conditional probability, diagnostic tests. The distribution of continuous variables, the density function. The normal distribution. Standardization, the binomial test as an application of standardization.
4. **Statistical estimation.**
   The central limit theorem; the standard error of the mean. The concept of a confidence interval. Confidence interval for the odds ratio. Confidence interval for the population mean. The t-distribution, the use of Student's t-table. Hypothesis tests: one sample t-test, binomial test.
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   One sample, paired, and independent samples t-test. Comparison of variances (F-test). One- and two-tailed tests.
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7. **The chi-square test for independence**
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   Type I and II errors, statistical power. The basics of sample size calculation
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   Principle of one-way ANOVA, F-test, pairwise comparisons. Repeated measurements ANOVA.
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12. **Survival analysis**
    Life-table, Kaplan-Meier method
13. **Multivariate methods**
    Factor analysis, cluster analysis, discriminant analysis. The aim and most important properties.

Supporting methods to achieve learning outcomes:

Teaching methods

We give practical examples based on medical and biological research papers to show the application of the methods in practice.

During the practices, the R, Rcommander programs are used.

Evaluation of the acquisition of expected learning outcomes:

Requirements:

Attendance of the practical part is obligatory. Participating in practical sessions according to the 'Study Guide of the Faculty of Medicine'. Maximum 3 absences are allowed and at least 51% completion of the course (see below). Students who arrive more than 15 minutes late will be considered absent.

Forms of testing

The students have to perform two tests that contain practical problems that have to be solved by hand calculations and by a computer program (R, Rcommander). During the tests, the use of calculators, computers (without Internet) and their own notes on a single A4 sheet is allowed.

Evaluation of the course:

The course result is evaluated by a three-grade sign. It will be calculated from the test points (maximum 100 points). For successful completion of the course, the total accomplishment must be at least 51%.

The evaluation of the practical is based on the sum of two tests.

Accomplishement, practice, %	**Evaluation**
0% -50,99%	Not met requirements /Failed(NOMETRE)
51%-90,99%	Met requirements /Satisfactory (METRE/P)t
91%-	Met requirements /Excellent(METRE/H)

Mandatory reading list:

Students can download course material (handouts, lecture notes, R scripts) from Coospace. Making notes at lectures will help in preparing for the exam.

Recommended reading list:

- Michael J. Campbell – David Machin – Stephen J. Walters: Medical Statistics. A Textbook for the Health Sciences (2012) ISBN: 978-1-118-30061-9
- Internet resources:
  Khan Academy: https://www.khanacademy.org/math/statistics-probability
  Crash Course (Statistics): https://www.youtube.com/playlist?list=PL8dPuuaLjXtNM_Y-bUAhblSAdWRnmBUcr
  Rice Virtual Lab in Statistics: http://onlinestatbook.com/rvls.html
- Reiczigel Jenő – Harnos Andrea – Solymosi Norbert: Biostatisztika nem statisztikusoknak (2014). Pars Kft. ISBN: 978-963-06-3736-7 (In Hungarian)
- E-learning (in Hungarian): http://eta.bibl.u-szeged.hu/view/creators/Sz==0171cs=3AM=F3nika=3A=3A.html

Indicating course requirements on CooSpace scene (summary)

Description (public):

The aim of this course is to familiarize students with the most commonly used statistical methods in the clinical and research fields of medicine, enabling them to apply these methods. Students will also learn to correctly interpret statistical results from statistical software or medical articles.

Throughout the course, students will learn the concepts of data and databases. They will be able to formulate hypotheses specific to a given experimental design, create the necessary database, determine the types of variables within the database, and describe their distribution.

Students will become familiar with the methods of hypothesis testing commonly used in medical research and with the fundamentals of statistical modeling. They will learn how to select appropriate statistical methods to test hypotheses, run statistical analyzes using

statistical programs, and draw appropriate statistical and medical conclusions based on the results, interpreting them according to industry standards. In addition, they will learn when it is necessary to involve a statistician in the research process.

Requirements:

Attendance of the practical part is obligatory. Participating in practical sessions according to the 'Study Guide of the Faculty of Medicine'. Maximum 3 absences are allowed and at least 51% completion of the course (see below).

Forms of testing

The students have to perform two tests containing practical problems to be solved by hand calculations and by a computer program (R, Rcommander) or interpreting R output. During the tests, the use of calculators, computers (without Internet) and their own notes on a single A4 sheet is permitted.

Evaluation of the course:

The course result is evaluated by a three-grade sign. It will be calculated from the test points (maximum 100 points). For a successful completion of the course, the total accomplishment must be at least 51%.

The evaluation of the practical is based on the sum of two tests.

Accomplishement, practice, %	**Evaluation**
0% -50,99%	Not met requirements /Failed(NOMETRE)
51%-90,99%	Met requirements /Satisfactory (METRE/P)t
91%-	Met requirements /Excellent(METRE/H)

Topics:

1. **Introduction. Data description.**

   Types of data, display of data. Sample characteristics. Categorical and continuous variables, absolute and relative frequency, bar chart, pie chart, histogram; mean, median, mode, range, quartiles, variance, standard deviation, mean-error chart, box diagram). Population, sample.

2. **Basics of Probability Theory I.**

   The concept of probability, rules of probability calculus. Odds, odds ratio. Definition of a categorical variable, the distribution, expected value, and variance of a categorical variable. Special discrete distributions: the binomial and Poisson distributions.

3. **Basics of Probability Theory II.**

   Conditional probability, diagnostic tests. The distribution of continuous variables, the density function. The normal distribution. Standardization, the binomial test as an application of standardization.

4. **Statistical estimation.**

   The central limit theorem; the standard error of the mean. The concept of a confidence interval. Confidence interval for the odds ratio. Confidence interval for the population mean. The t-distribution, the use of Student's t-table. Hypothesis tests: one sample t-test, binomial test.

5. **Statistical inference, t-tests**

   One sample, paired, and independent samples t-test. Comparison of variances (F-test). One- and two-tailed tests.

6. **Correlation-regression analysis.**

   Single and multiple linear regression. Linear regression on transformed data.

7. **The chi-square test for independence**

   Assumptions, Fisher exact test

8. **Statistical errors**

   Type I and II errors, statistical power. The basics of sample size calculation

9. **Analysis of variance**

Principle of one-way ANOVA, F-test, pairwise comparisons. Repeated measurements ANOVA.

10. **Nonparametric methods based on ranks**
    Wilcoxon-test, Mann-Whitney test, Kruskal-Wallis test
11. **2x2 tables in epidemiology**
    Cohen-Kappa, relative risk, odds ratio, logistic regression.
12. **Survival analysis**
    Life-table, Kaplan-Meier method
13. **Multivariate methods**
    Factor analysis, cluster analysis, discriminant analysis. The aim and most important properties.

Informing students on course requirements
(In accordance with information and study materials available on CooSpace)
From februar 2025

Program: PhD day- training for SH students and self-cost students
Course: **Biomedical ethics**
Academic year/Semester: 2024/2025 2nd
Educator and contact details (e-mail): **Gergely Tari PhD**, assistant professor, email: tari.gergely.robert@med.u-szeged.hu
Type of course: lecture/seminar/**practice**/laboratory
Weekly hours of the course: 7*2 hours
Credit vale of the course: 3 credits
Type of examination: final exam at the end of semester, **practice exam**, other:-
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): **not**
Purpose of course: Bioethics is a rapidly developing field of applied ethics, strongly related to biomedical research. However, advanced medical technologies armor medical professionals with all new diagnostic and curative tools, ethical and legal reflexion is often necessary before using them routinely in the daily medical practice. The aim of the course is to interpret all the bioethical principles (Patient autonomy, non-maleficence, beneficence, justice) to our students as well the international laws that are regulating biomedical research. Course is recommended to all, who is somehow involved in scientific research.
Outcome requirements of the course (specific academic results to be established by the course): Knowledge - Being familiar with the basic bioethical principles - Being familiar with the history of ethics of animal research - Being familiar with the history of ethics of human subject research - Being familiar with the most important international ethical guidelines regulating the practice of medical professionals and biomedical researchers Competences - Having the skill to use appropriate arguments based on sound ethical standards - Having the skill to recognize ethical dilemmas in the clinical practice - Having the skills to apply basic bioethical principles to solve moral dilemmas Attitudes

- Sensitizing our students to favor an attitude in which the most influential norms are patient autonomy, human dignity and non-discrimination. Autonomy and responsibility - Having responsibility to behave according to the standards of modern biomedical ethics and be able to recognize, interpret and if it is possible solve ethical dilemmas
Topics: 1. Introduction to bioethics 2. Basics of human subject research – international ethical and legal approach 3. Basics of animal experimentation - international ethical and legal approach 4. Ethical implications regarding biomedical research on human subjects 5. Ethical issues of human reproduction (with special regard to *in vivo* and *in vitro* fertilization) 6. „Gene-ethics” (PGT; CRISPR-Cas9) 7. Practical application of ethical principles of biomedical research (workshop)
Supporting methods to achieve learning outcomes: Workshops Practicing moral arguments
Evaluation of the acquisition of expected learning outcomes: - Attandence regulated according to the study and examination rules - Grade is given according to attendance - Written test should be written for those students who have abscences
Mandatory reading list: Lewis Vaughn: Bioethics. Principles, Issues, and Cases. Oxford University Press, 2022.
Recommended reading list: Sinaci, M., Sorgner, S.F. (szerk.): Ethics of Emerging Biotechnologies. From Educating the Young to Engineering Posthumans. Trivent Publishing, Budapest, 2018.

Indicating course requirements on CooSpace scene (summary)

Description (public): Bioethics is a rapidly developing field of applied ethics, strongly related to biomedical research. However, advanced medical technologies armor medical professionals with all new diagnostic and curative tools, ethical and legal reflexion is often necessary before using them routinely in the daily medical practice. The aim of the course is to interpret all the bioethical principles (Patient autonomy, non-maleficence, beneficence, justice) to our students as well the international laws that are regulating biomedical research. Course is recommended to all, who is somehow involved in scientific research.
Requirements:

Knowledge

- Being familiar with the basic bioethical principles
- Being familiar with the history of ethics of animal research
- Being familiar with the history of ethics of human subject research
- Being familiar with the most important international ethical guidelines regulating the practice of medical professionals and biomedical researchers

Competences

- Having the skill to use appropriate arguments based on sound ethical standards
- Having the skill to recognize ethical dilemmas in the clinical practice
- Having the skills to apply basic bioethical principles to solve moral dilemmas

Attitudes

- Sensitizing our students to favor an attitude in which the most influential norms are patient autonomy, human dignity and non-discrimination.

Autonomy and responsibility

- Having responsibility to behave according to the standards of modern biomedical ethics and be able to recognize, interpret and if it is possible solve ethical dilemmas

Evaluation of the acquisition of expected learning outcomes:

- Attandence regulated according to the study and examination rules
- Grade is given according to attendance
- Written test should be written for those students who have abscences

Topics:

1. Introduction to bioethics
2. Basics of human subject research – international ethical and legal approach
3. Basics of animal experimentation - international ethical and legal approach
4. Ethical implications regarding biomedical research on human subjects
5. Ethical issues of human reproduction (with special regard to *in vivo* and *in vitro* fertilization)
6. „Gene-ethics” (PGT; CRISPR-Cas9)
7. Practical application of ethical principles of biomedical research (workshop)

Supporting methods to achieve learning outcomes:

Workshops
Practicing moral arguments

Mandatory reading list:

Lewis Vaughn: Bioethics. Principles, Issues, and Cases. Oxford University Press, 2022.

Recommended reading list:

Sinaci, M., Sorgner, S.F. (szerk.): Ethics of Emerging Biotechnologies. From Educating the Young to Engineering Posthumans. Trivent Publishing, Budapest, 2018.

Module I/B.: Special (PhD program-related) PhD courses

-A **minimum of 18 credits** must be obtained within each PhD subprogram (specialization) during the first to fourth semesters.

-Information on courses offered in the current semester is available in the NEPTUN system.

-Each course may be completed only once and its credit value can be counted a single time.

-The Comprehensive Examination must be taken at the end of the fourth semester in the case of full-time doctoral training.

-The total number of **compulsory educational credits** (including core subjects and compulsory elective courses specific to each subprogram/specialization) is 20 + 18 = **38 credits**.

-The courses offered within each subprogram may vary from semester to semester. Information on the currently available courses can be found in the NEPTUN system during the course registration period.

-Courses are announced by the responsible lecturers and/or their respective departments at the beginning of each semester.

1. DERMATOLOGY PhD program KODI-DERMA
Programme director: Prof. Dr. Lajos Kemény

Clinical Dermatology KODI-DERMA-01 (Coordinator: Prof. Dr. Lajos Kemény. 28 hours, 6 credits, end-semester exam, 2-4 pm Wednesdays)

Differential Diagnosis of Inflammatory Skin Diseases KODI-DERMA-02 (Coordinator: Prof. Dr. Lajos Kemény. 28 hours, 6 credits, final exam, 8-10 am Fridays)

Differential Diagnostic Procedures in Dermato-Oncology KODI-DERMA-03 (Coordinator: Prof. Dr. Judit Oláh. 28 hours, 6 credits, final exam, 2-4 pmTuesdays)

Doktori Iskola neve:	SZTE Klinikai Orvostudományi Doktori Iskola
Tárgycsoport neve: (*alprogram=szakirány)	**Dermatológia**
Tárgy (kurzus) neve:	**Clinical dermatology**
Szervezeti egység neve (felelős tanszék):	
Tárgyfelelős oktató neve:	**Prof. Dr. Kemény Lajos** tanszékvezető egyetemi tanár
Tárgyfelelős e-mail címe:	kemeny.lajos@med.u-szeged.hu
Kurzus előfeltétele:	
Kurzus meghirdetése: (2019-2020. tanév őszi szemeszter – I. félév vagy tavaszi szemeszter – II. félév)	I.(őszi) és II. (tavaszi) félév
Kurzus javasolt felvétele 1-4. félév közül:	
Kurzus pontos időpontja:	
Kurzus helyszíne:	**SZTE ÁOK Bőrgyógyászati és Allergológiai Klinika**
**Heti óraszám:	2
**Összes óraszám félévente:	28
**Kreditpont:	6
Követelmény típus (teljesítés módja): ötfokozatú beszámoló vagy kollokvium	kollokvium
Kurzus felvételek max. száma:	1
Kurzushirdető tanszék:	**SZTE ÁOK Bőrgyógyászati és Allergológiai Klinika**
Kurzus típusa:	előadás
Vizsgatípus: szóbeli és/vagy írásbeli	szóbeli
A kurzus oktatói:	Dr. Kemény Lajos, Dr. Bata Zsuzsanna, az SZTE Bőrgyógyászati és Allergológiai Klinikai oktatói
Tematika: tantárgy tematika heti bontásban	
Ajánlott irodalom:	Journal if the European Academy of Dermatology and Allergology folyóirat számai, egyéb angol nyelvű szakmai folyóiratok

2. IMMUNOLOGY program KODI-IMMUN
Program Director: Prof. Dr. Zsuzsanna Bata-Csörgő

The courses below are COMPULSORY for students doing their PhD in Immunology:

Clinical Immunology and Allergology KODI-IMMUN-01 (Coordinator: Prof. Dr. Zsuzsanna Bata-Csörgő. 28 hours, 6 credits, final exam)

Clinical Dermatology KODI-IMMUN-02 (Coordinator: Prof. Dr. Lajos Kemény. 28 hours, 6 credits, final exam, 14-16 Wednesdays)

Differential Diagnosis of Inflammatory Skin Diseases KODI-IMMUN-03 (Coordinator: Prof. Dr. Lajos Kemény. 28 hours, 6 credits, final exam, 8-10 Fridays)

The courses below are ELECTIVE, but recommended for students doing their PhD in Immunology:

Differential Diagnostic Procedures in Dermato-Oncology KODI-IMMUN-04 (Coordinator: Prof. Dr. Judit Oláh. 28 hours, 6 credits, final exam, 14-16 Tuesdays)

Selected Chapters from Immunology KODI-IMMUN-05 (Coordinator: Dr. Zoltán Veréb. 28 hours, 6 credits, final exam)

Regenerative Medicine and Stem Cell Biology KODI-IMMUN-06 (Coordinator: Dr. Zoltán Veréb. 28 hours, 6 credits, final exam)

Doktori Iskola neve:	SZTE Klinikai Orvostudományi Doktori Iskola
Tárgycsoport neve: (*alprogram=szakirány)	**Immunológia**
Tárgy (kurzus) neve:	**Clinical immunology and allergology**
Szervezeti egység neve (felelős tanszék):	
Tárgyfelelős oktató neve:	**Prof. Dr. Bata-Csörgő Zsuzsanna** egyetemi tanár
Tárgyfelelős e-mail címe:	bata.zsuzsa@med.u-szeged.hu
Kurzus előfeltétele:	
Kurzus meghirdetése: (2019-2020. tanév őszi szemeszter – I. félév vagy tavaszi szemeszter – II. félév)	II. (tavaszi) félév
Kurzus javasolt felvétele 1-4. félév közül:	
Kurzus pontos időpontja:	
Kurzus helyszíne:	**SZTE ÁOK Bőrgyógyászati és Allergológiai Klinika tanterme**
**Heti óraszám:	2
**Összes óraszám félévente:	28
**Kreditpont:	6
Követelmény típus (teljesítés módja): ötfokozatú beszámoló vagy kollokvium	kollokvium
Kurzus felvételek max. száma:	
Kurzushirdető tanszék:	**SZTE ÁOK Bőrgyógyászati és Allergológiai Klinika**
Kurzus típusa:	előadás
Vizsgatípus: szóbeli és/vagy írásbeli	írásbeli
A kurzus oktatói:	Dr. Bata Zsuzsanna, Dr. Jost Krisztina, Dr. Széll Márta, Dr. Németh István Balázs, Dr. Balog Attila, Dr. Gaál Magdolna, Dr. Kovács László
Tematika: tantárgy tematika heti bontásban	1. A klinikai immunológia alapjai, helye és jelentősége az orvostudományban Előadó: Dr. Bata Zsuzsanna 2.Immunológiai laboratóriumi vizsgáló módszerek Előadó: Dr. Jost Krisztina 3.Immunológiai betegségek genetikája Előadó: Dr. Széll Márta 4.Allergiás betegségek Előadó: Dr. Bata Zsuzsanna 5.Tumorimmunológia Előadó: Dr. Németh István 6.Biológiai terápiák Előadó: Dr. Kemény Lajos 7.Szervspecifikus autoimmun betegségek Előadó: Dr. Balog Attila **Tavaszi szünet:**

	8.Polysysthemás autoimmun betegségek Előadó: Dr. Kovács László 9.Vasculitisek Előadó: Dr. Kovács László 10.Metabolikus szindróma Előadó: Dr. Kovács László 11.Immunmoduláció Előadó: Dr. Balog Attila 12.A HIV infekció Előadó: Dr. Gaál Magdolna 13.Konzultáció Előadó: Dr. Bata Zsuzsanna máj. 16.
Ajánlott irodalom:	

Doktori Iskola neve:	SZTE Klinikai Orvostudományi Doktori Iskola
Tárgycsoport neve: (alprogram=szakirány)	Immunológia alprogram
Tárgy neve:	Regenerative medicine and stem cell biology
Szervezeti egység neve (felelős tanszék):	
Tárgyfelelős neve:	Dr. Veréb Zoltán
Tárgyfelelős e-mail címe:	vereb.zoltan@med.u-szeged.hu
Kurzus előfeltétele:	nincs
Kurzus meghirdetése: (őszi szemeszter – I. félév vagy tavaszi szemeszter – II. félév)	tavaszi szemeszter II. félév
Kurzus javasolt felvétele 1-4. félév közül:	4. félév
Heti óraszám:	2
Összes óraszám:	28
Kreditpont:	6
Követelmény típus (teljesítés módja): ötfokozatú beszámoló vagy kollokvium	kollokvium
Kurzus felvételek max. száma:	1 (A tárgyelem nem ismételhető)
Kurzushirdető tanszék:	SZTE ÁOK Bőrgyógyászati és Allergológiai Klinika
Kurzus típusa:	elméleti
Vizsgatípus: szóbeli és/vagy írásbeli	szóbeli
A kurzus oktatói:	Dr. Zoltán Veréb, Prof. Dr. Ferenc Uher
*Tematika: tantárgy tematika heti bontásban	**1. Introduction** Description of the course, detailed overview. Presentation of recommended literature, databases and on-line materials. Review of the history of regenerative medicine. **2. Stem Cells Part 1.**

	Basics of stem cells, their classification. Cell division, specific for stem cells and differentiation. Embryonic development, embryonic stem cells. **3. Stem Cells Part 2.** Somatic stem cells, their origin and their development. The stem cell niche, epithelial differentiation in detail. Classification of somatic stem cells. Definition of hematopoietic stem cells, mesenchymal stem cells and induced pluripotent stem cells. **4. Hematopoietic stem cells (HSCs)** Development of the blood cells. Hematopoietic stem cell subpopulations. Non hematopoietic functions of HSCs. **5. The basics of immunology** The structure, cells and molecules of the immune system. Characteristics and basic processes of innate and adaptive immunity. **6. Mesenchymal stem cells (MSCs)** Definition, origin and differentiation of tissue specific mesenchymal stem cells. Properties of MSCs isolated from different tissues. Phenotype and functional characteristics of MSCs. **7. Immunological properties of mesenchymal stem cells 1.** The relationship between mesenchymal stem cells and the immune system. MSCs and their role in innate immunity. Immunomodulatory mechanisms. **8. Immunologic properties of malechymal stem cells.** The relationship between mesenchymal stem cells and the immune system. MSCs and their role in adaptive immunity. Immunomodulatory mechanisms. **9. Wound healing, angiogenesis** Details of tissue regeneration. The role of stem cells in tissue regeneration and wound healing. Mechanism of angiogenesis and neovascularization. The role of stem cells and their subpopulations in angiogenic processes. **10. Therapeutic use of mesenchymal stem cells 1.** Therapeutic use of mesenchymal stem cells derived from different tissues in cardiovascular, haematological disorders. Healing of nerve damage and neurological disorders with stem cells **11. Therapeutic use of mesenchymal stem cells 2.** Use of adipose tissue derived mesenchymal stem cells in regenerative medicine. Plastic surgery procedures, treatments of burns. Replacement of bone, cartilage and skin tissue. **12. Induced pluripotent stem cells (iPSC)** Development of iPSCs. Definition of iduced pluripotency. Therapeutic applications of iPS cells. **13. 3D Bioprinting**

	Basics of 3D printing. Biofabrication of tissues and organs. Introduction of bioscaffolds and stem cells in tissue printing.. **14. Ethics and regulation** Ethical, legal aspects and Quality Control of Cellular Therapy Products. Regulations, and the basic of GMP. In vitro test systems for the manufacture of cellular therapeutic products.
*Ajánlott irodalom:	• Peter Parham: The Immune System, 2014 • Gnecchi, Massimiliano (Ed.): Mesenchymal Stem Cells, Methods and Protocols, Springer, 2016 • Prockop, Darwin J., Phinney, Donald G., Bunnell, Bruce A.: Mesenchymal Stem Cells, Methods and Protocols, Springer, 2008 • Mohan C. Vemuri, Lucas G. Chase: Mesenchymal Stem Cell Therapy, Humana Press, 2012

Doktori Iskola neve:	SZTE Klinikai Orvostudományi Doktori Iskola
Tárgycsoport neve: (alprogram=szakirány)	Immunológia alprogram
Tárgy neve:	Selected chapters on immunology
Szervezeti egység neve (felelős tanszék):	
Tárgyfelelős neve:	Dr. Veréb Zoltán
Tárgyfelelős e-mail címe:	vereb.zoltan@med.u-szeged.hu
Kurzus előfeltétele:	nincs
Kurzus meghirdetése: (őszi szemeszter – I. félév vagy tavaszi szemeszter – II. félév)	őszi szemeszter – I. félév tavaszi szemeszter – II. félév
Kurzus javasolt felvétele 1-4. félév közül:	4. félév
Heti óraszám:	2
Összes óraszám:	28
Kreditpont:	6
Követelmény típus (teljesítés módja): ötfokozatú beszámoló vagy kollokvium	kollokvium
Kurzus felvételek max. száma:	1 (A tárgyelem nem ismételhető)
Kurzushirdető tanszék:	SZTE ÁOK Bőrgyógyászati és Allergológiai Klinika
Kurzus típusa:	elméleti
Vizsgatípus: szóbeli és/vagy írásbeli	szóbeli és írásbeli
A kurzus oktatói:	Dr. Zoltán Veréb, Prof. Dr. Zsuzsanna Bata, Dr. Klára Megyeri, Prof. Dr. Lajos Kemény, Dr. István Balázs Németh
*Tematika: tantárgy tematika heti bontásban	1.Introduction Course overview. Presentation of recommended literature, databases and on-line materials. The basics of immunology, the structure, cells and molecules of the immune system. Characteristics and basic processes of innate and adaptive immunity. 2. Immunotherapies

	Immunological therapies. Treatment of tumors with immune cells. T-cell and dendritic cell based therapies. CAR therapy. 3. Vaccines Active and passive immunization. Vaccine development and manufacturing technologies. Vaccinations induced hypersensitivity reactions. 4. New Viruses and new challenges Chikungunya, ebola, Zika, Guaico Culex, Marburg and JC viruses. Details of the specific immune response they induce. Diagnosis and possible therapies during rare viral infections. 5. Biological therapies in inflammatory disorders Basic mechanisms of biological therapies. The development and manufacturing of biological therapeutic products. Autoimmun diseases, rheumatic disorders (eg SPA; psoriasis, psoriasis arthritis, arthritis). 6. Immunological background of pregnancy The immunological background of immunosuppression and tolerance under pregnancy. 7. Mesenchymal stem cells and immunosuppression. The relationship between mesenchymal stem cells and the immune system. MSCs in innate and adaptive immunity. Immunomodulatory mechanisms. Activation of MScs by PRR and TLR receptors. Treatment of steroid resistant GvHD with stem cells. 8. Food allergies and their treatment Immunological background of food allergies. Early diagnostic options and new therapeutic procedures (oral immunotherapy, etc.). The role of microbial gut flora in food allergies. 9. Drug allergies and their treatment Immunological background of drug allergies. Laboratory diagnostics of allergic reactions caused by pharmaceutical products. Clinical appearance and treatment of drug induced allergies. 10. The role of extracellular matrix in the regulation of the immune processes. Changes in the extracellular matrix in inflammatory processes. Signalling pathways mediated by the extracellular matrix. Immunological reactions induced by the extracellular matrix. 11. Wound healing, immunological background of angiogenesis Steps of tissue regeneration. The role of immune response and inflammation in tissue regeneration and wound healing. Mechanisms of angiogenesis and neovascularization. The role of immune cells in angiogenesis. 12. Melanoma - new challenges and opportunities New paradigms in the pathology of melanoma. The role of stroma and stem cells in the development of melanoma. Escaping mechanisms.

	13. Hepatitis viruses Pathomechanism of Hepatitis Virus Infections. Immune response. The antiviral defense of hepatocytes. New challenges and therapeutic options. 14. Gene therapy procedures. History of gene therapy. Vectors. CRISPR based systems.
*Ajánlott irodalom:	• Peter Parham: The Immune System • Abul K. Abbas, Andrew H. Lichtman: Basic Immunology Updated Edition: Functions and Disorders of the Immune System • Abul K. Abbas, Andrew H. Lichtman: Cellular and Molecular Immunology • Materials presented during the course

3. REPRODUCTIVE HEALTH PhD program KODI-REPRO

Programme Director: Prof. Dr. György Bártfai

Family planning KODI-REPRO-ELE-1 (Coordinator: Dr. Tamás Bitó, 28 hours, 6 credits, final exam)

Complications in pregnancy KODI-REPRO-ELE-2 (Coordinator: Dr. Tamás Bitó, 28 hours, 6 credits, final exam)

Obstetric and gynecological aspects of metabolic diseases KODI-REPRO-ELE-3 (Coordinator: Dr. Tamás Bitó, 28 hours, 6 credits, final exam)

Program: PhD
Course: **Family planning**
Academic year/Semester: **2024-2025/2nd semester**
Educator and contact details (e-mail): **Dr. habil. Tamás Bitó, bito.tamas@med.u-szeged.hu**
Type of course: **lecture**/seminar/practice/laboratory
Weekly hours of the course: **2**
Credit vale of the course: **6**
Type of examination: **final exam at the end of semester**, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): **Prior medical or pharmaceutical studies**
Purpose of course: **To provide an overview on different aspects of human reproduction, family planning and birth control.**
Outcome requirements of the course (specific academic results to be established by the course): **Ability to write a project proposal for ethical approval** **Successfull verbal final exam**
Topics:

Reproductive rights, female cycle, conception, physiological and pathological changes in pregnancy, infertility, assisted reproduction, fertility regulation, spontaneous and induced abortion.
Supporting methods to achieve learning outcomes: Teaching methods: **Besides giving theoretical background, we give practical examples based on medical research papers to show the application of the methods in practice. During some lectures, students actually present will get homework on the lectures to get bonus points on the final.** Homework: **To prepare a questionnare based study on the socio-economic background and lifestyle factors of spontaneous abortion.**
Evaluation of the acquisition of expected learning outcomes: Requirements: **Usable practical knowledge on different aspects of human reproduction. Ability to write a project proposal for ethical approval** Examination requirements: **Successful verbal final exam**
Mandatory reading list: **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400** **https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception** **https://www.paho.org/en/topics/sexual-and-reproductive-health**
Recommended reading list: **Medical eligibility criteria for contraceptive use, Fifth edition, 2015** **https://iris.who.int/bitstream/handle/10665/181468/9789241549158_eng.pdf?sequence=9** **WHO, ACOG and RCOG guidelines related to the topics**

Indicating course requirements on CooSpace scene (summary)

Description (public): **The aim of the course is to provide an overview on different aspects of human reproduction, family planning and birth control.**
Requirements: **Prior medical or pharmaceutical studies**
Topics: **Female cycle, conception, physiological and pathological changes in pregnancy, infertility, assisted reproduction, fertility regulation, spontaneous and induced abortion, reproductive rights** - supporting methods to achieve learning outcomes **Theoretical lectures and practical examples for project proposal writing in the field of human reproduction.** - mandatory reading list **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400** **https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception** **https://www.paho.org/en/topics/sexual-and-reproductive-health** - recommended reading list

Medical eligibility criteria for contraceptive use, Fifth edition, 2015,
WHO, ACOG and RCOG guidelines related to the topics

Program: **PhD**

Course: **Complications in pregnancy**

Academic year/Semester: **2024-2025/2nd semester**

Educator and contact details (e-mail):
Dr. habil. Tamás Bitó
bito.tamas@med.u-szeged.hu

Type of course**: lecture**/seminar/practice/laboratory

Weekly hours of the course: **2**

Credit vale of the course: **6**

Type of examination: **final exam at the end of semester**, practice exam, other:……..

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course):
Prior medical or pharmaceutical studies

Purpose of course: **To provide an overview on different possible complications during pregnancy, its consequences and management.**

Outcome requirements of the course (specific academic results to be established by the course):
Ability to write a project proposal for ethical approval
Successfull verbal final exam

Topics:
The effect of pregnancy on various diseases, the effect of diseases on the course and outcome of pregnancy, antenatal care and delivery in case of pregnant women with different diseases.

Supporting methods to achieve learning outcomes:

Teaching methods:
Besides giving theoretical background, we give practical examples based on medical research papers to show the application of the methods in practice. During some lectures, students actually present will get homework on the lectures to get bonus points on the final.

Homework: **To prepare a project proposal of a prospective observational study on the pregnancy outcome in case of a given disease.**

Evaluation of the acquisition of expected learning outcomes:

Requirements:
Usable practical knowledge on pregnancies with different diseases. Ability to write a project proposal for ethical approval

Examination requirements: **Successfull verbal final exam**

Mandatory reading list:

Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400

Recommended reading list:
WHO, ACOG and RCOG guidelines related to the topics

Indicating course requirements on CooSpace scene (summary)

Description (public): **The aim of the course is to provide an overview on different possible complications during pregnancy, its consequences and management.**.
Requirements: **Prior medical or pharmaceutical studies**
Topics: **The effect of pregnancy on various diseases, the effect of diseases on the course and outcome of pregnancy, antenatal care and delivery in case of pregnant women with different diseases.** - supporting methods to achieve learning outcomes **Theoretical lectures and practical examples for project proposal writing in case of complicated pregnancy by different diseases.** - mandatory reading list **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400** - recommended reading list: **WHO, ACOG and RCOG guidelines related to the topics**

Program: **PhD**
Course: **Obstetric and gynecological aspects of metabolic diseases**.
Academic year/Semester: **2025-2026/1st semester**
Educator and contact details (e-mail): **Dr. habil. Tamás Bitó** **bito.tamas@med.u-szeged.hu**
Type of course: **lecture**/seminar/practice/laboratory
Weekly hours of the course: **2**
6Credit vale of the course: **6**
Type of examination: **final exam at the end of semester**, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): **Prior medical or pharmaceutical studies**
Purpose of course: **To provide an overview on obstetric and gynecological aspects of different metabolic alterations.**
Outcome requirements of the course (specific academic results to be established by the course): **Ability to write a project proposal for ethical approval** **Successfull final exam**
Topics: **Obstetric complications related to obesity, insulin resitance, diabetes mellitus. Screening and management of GDM. Gynecological diseases (incl. PCOS, infertility, endometrial hyperplasia/carcinoma) associated with metabolic alterations. Contracetption in case of metabolic alterations.**
Supporting methods to achieve learning outcomes: Teaching methods:

Besides giving theoretical background, we give practical examples based on medical research papers to show the application of the methods in practice. During some lectures, students actually present will get homework on the lectures to get bonus points on the final. Homework: **To prepare a project proposal of a prospective observational study on the pregnancy outcome in case of a given metabolic alteration.**
Evaluation of the acquisition of expected learning outcomes: Requirements: **Usable practical knowledge on obstetric and gynecological aspects of different metabolic alterations. Ability to write a project proposal for ethical approval** Examination requirements: **Successfull verbal final exam**
Mandatory reading list: **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400**
Recommended reading list: **Medical eligibility criteria for contraceptive use, Fifth edition, 2015** **https://iris.who.int/bitstream/handle/10665/181468/9789241549158_eng.pdf?sequence=9** **WHO, ACOG and RCOG guidelines related to the topics**

Indicating course requirements on CooSpace scene (summary)

Description (public): **The aim of the course is to provide an overview on obstetric and gynecological aspects of different metabolic alterations.**
Requirements: **Prior medical or pharmaceutical studies**
Topics: **Obstetric complications related to obesity, insulin resitance, diabetes mellitus. Screening and management of GDM. Gynecological diseases (incl. PCOS, infertility, endometrial hyperplasia/carcinoma) associated with metabolic alterations. Contracetption in case of metabolic alterations.** - supporting methods to achieve learning outcomes **Theoretical lectures and practical recommendations for project proposal writing.** - mandatory reading list **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400** - recommended reading list **Medical eligibility criteria for contraceptive use, Fifth edition, 2015** **WHO, ACOG and RCOG guidelines related to the topics**

4. EXPERIMENTAL AND CLINICAL NEUROSCIENCES PhD program KODI-NEUSC

Programme Director: Prof. Dr. László Vécsei

Understanding Pain: Bridging Science and Care AOKDI-ASZV-41 (Coordinator: Dr. Pál Barzó, 10 hours, 2 credits, final exam)

Neurology Roundtable A-D KODI-NEUSC-01 (Coordinator: Dr. Péter Klivényi, 10 hours, 2 credits, final exam)

Program: PhD
Course: Understanding Pain: Bridging Science and Care
Academic year/Semester: all phd students
Educator and contact details (e-mail): Prof. Dr. Barzó Pál; stankovic.mona@med.u-szeged.hu
Type of course: lecture/seminar/practice/laboratory
Weekly hours of the course: 2 hours biweekly
Credit vale of the course: 2
Type of examination: final exam at the end of semester, practice exam Students will take a written test (20 multiple-choice questions) during the final lecture. In the examination period students have the opportunity to take an oral exam. If a student actively participates in all lectures, they are eligible to receive a pre-determined grade four on a five-grade scale.
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): none for phd students.
Purpose of course: The lecture is based on the latest scientific literature and it aims to present the complex nature of pain, emphasizing the individual and mutual responsibilities of different disciplines—neurosurgery, pharmacy, psychology, and physiotherapy—in understanding and mitigating pain. The course will introduce students to the latest findings in pain research and provide a comprehensive overview of the multidisciplinary approach to pain management. Through several case studies, the lecture seeks to illustrate the everyday challenges of pain management, the difficulties encountered in clinical practice, as well as the currently available neuromodulation, pharmacotherapy, and conservative treatment options. The course strives to prepare students with both theoretical and practical knowledge to address the challenges of pain management in clinical setting.
Outcome requirements of the course (specific academic results to be established by the course): The course will equip students with both theoretical and practical knowledge preparing them for the challenges of pain management in clinical environment.
Topics: Lecture 1: The neuroanatomy of pain and pain theories. Different forms of pain and physiology of pain, pain measurement. Characteristics of the pain clinic. (Dr. Dávid Kis) Lecture 2: Psychosocial factors modulating the perception of pain. Effect of pain on quality of life. Chronic pain, conversion symptoms associated with pain, and treatment possibilities. Case study: variability in pain perception. (Dr. Mona Stankovic) Lecture 3: Pharmacotherapeutic options for pain relief. Advantages and risks of pharmacological pain management. (Dr. Réka Viola) Lecture 4: The role of physiotherapy in the management of musculoskeletal pain. Characteristics of conservative therapy, pain relief, and rehabilitation. (Edit Rónyai) Lecture 5: The role of alternative therapeutic treatments in pain management, including relaxation and altered states of consciousness. Ethical aspects of pain management. Case study: psychological and psychotherapeutic tools in pain relief. (Dr. Mona Stankovic) Lecture 6: Introduction to neuromodulation for chronic and neuropathic pain, types of neuromodulation and main indications. (Dr. Dávid Kis) Lecture 7: Overview of the course material. Written Exam: 20 multiple-choice questions.

Supporting methods to achieve learning outcomes: Besides giving theoretical background, we give practical examples based on medical, biological research papers to show the application of the methods in practice. Discussion of case studies, distribution of the powerpoint presentations displayed during the lectures.
Evaluation of the acquisition of expected learning outcomes: **Requirements:** **Examination requirements**
Mandatory reading list:
Recommended reading list: Jackson K. C., 2nd (2006). Pharmacotherapy for neuropathic pain. Pain practice: the official journal of World Institute of Pain, 6(1), 27–33. Koes, B. W., Backes, D., & Bindels, P. J. E. (2018). Pharmacotherapy for chronic non-specific low back pain: current and future options. Expert opinion on pharmacotherapy, 19(6), 537–545. Kinney, M., Seider, J., Beaty, A. F., Coughlin, K., Dyal, M., & Clewley, D. (2020). The impact of therapeutic alliance in physical therapy for chronic musculoskeletal pain: A systematic review of the literature. Physiotherapy theory and practice, 36(8), 886–898. Réthelyi J. M., Berghammer R., & Kopp M. S. (2001). Comorbidity of pain-associated disability and depressive symptoms in connection with sociodemographic variables: results from a cross-sectional epidemiological survey in Hungary. Pain, 93(2), 115–121. Wang, J., & Chen, Z. (2019). Neuromodulation for Pain Management. Advances in experimental medicine and biology, 1101, 207–223. Woolf C. J. (2010). What is this thing called pain?. The Journal of clinical investigation, 120(11), 3742–3744.

5. EXPERIMENTAL AND CLINICAL INVESTIGATION OF THE CARDIOVASCULAR SYSTEM PhD program KODI-CARDI

Program Director: Prof. Dr. Tamás Forster

To be announced later.

6. CLINICAL AND EXPERIMENTAL RESEARCH FOR RECONSTRUCTIVE AND ORGAN-SPARING SURGERY PhD programme KODI-RECON

Program Director: Prof. Dr. György Lázár

Craniofacial Malformations - Clinical Team Meeting KODI-RECON-10 (Coordinator: Prof. Dr. József Piffkó, 2 hours/ week, 30 hours/semester, 6 credits. 2-4 pm Tuesdays, Department of Oral and Maxillofacial Surgery, Albert Szent-Györgyi Medical Center, University of Szeged, 57 Kálvária sugárút, Szeged, Hungary)

Clinical Maxillofacial Consultations KODI-RECON-11 (Coordinator: Prof. Dr. József Piffkó, 2 hours/ week, 6 credits. 12-14 Tuesdays, Department of Oral and Maxillofacial

Surgery, Albert Szent-Györgyi Medical Center, University of Szeged, 57 Kálvária sugárút, Szeged, Hungary)

Name of the Doctoral School	SZTE Doctoral School of Clinical Medicine
Subject group name: (* subprogram = specialization)	Clinical and experimental research in restorative and organ-sparing surgery
Name of the course	KODI-KLI-10 **Craniofacial malformations - clinical team meating**
Name of organizational unit (responsible department):	Department of Facial, Oral and Maxillofacial Surgery
Name of the instructor in charge of the subject	**Prof. Dr. Dr. Piffkó József**
Subject email address:	office.maxillo@med.u-szeged.hu
Prerequisite for the course:	
Recommended admission to the course 1-4. semester:	1, 3
Exact course date:	Tuesday 4 to 6 p.m.
Course location:	SZTE SZAKK Department of Oral and Maxillofacial Surgery
** Hours per week:	2
** Total number of hours per semester :	28
** credits :	6
Requirement type (method of fulfillment): five-grade report or colloquium	colloquium
Course recordings max. number:	2
Course advertising department :	SZTE SZAKK Clinic of Facial, Maxillofacial and Oral Surgery
Exam Type: oral and / or written	oral
Instructors of the course:	Prof. Dr. Dr. Piffkó József Ph.D. Dr. Segatto Emil Ph.D. Dr. Sáfrány-Fárk Árpád Ph.D.
Thematics: subject topics by week	Week 1 Clinical patient material analysis, practical implementations Week 2 Clinical patient material analysis, practical implementations Week 3 Clinical patient material analysis, practical implementations Week 4 Clinical patient material analysis, practical implementations Week 5 Clinical patient material analysis, practical implementations Week 6 Clinical patient material analysis, practical implementations Week 7 Clinical patient material analysis, practical implementations Week 8 Clinical patient material analysis, practical implementations Week 9 Clinical patient material analysis, practical implementations Week 10 Clinical patient material analysis, practical implementations Week 11 Clinical patient material analysis, practical implementations Week 12 Clinical patient material analysis, practical implementations Week 13 Clinical patient material analysis, practical implementations Week 14 Clinical patient material analysis, practical implementations
Recommended reading:	Szabó György: Szájsebészet, maxillofaciális sebészet Semmelweis Kiadó, 2004, ISBN: 9639214361 https://www.tankonyvtar.hu/hu/tartalom/tamop412A/2011-0032_magyar/adatok.html

Details of the Clinical patient material analysis and the practical implementations are described in the following table:

Patient Evaluation and Clinical Diagnosis	Lip–incisor relationship
Patient interview	Sequencing the planning process
Psychosocial history	Prediction planning
Medical history	Cephalometric prediction planning
Suitability for orthognathic treatment	Photographic prediction planning
Clinical diagnostic records	Model surgery
Purpose of clinical records	**Planning Using CBCT**
Mandatory and additional records for orthognathic surgery	Tooth morphology and relative position within the alveolar bone
Patient evaluation – the basics	3D CBCT diagnosis and treatment planning
Evaluation in repose and animation	Temporomandibular joint health and disease
Cephalometric analyses	Airway assessment
Systematic clinical evaluation	Dentofacial deformities and craniofacial anomalies
Clinical facial evaluation	Longitudinal assessments using CBCT
Cephalometric analysis	Construction of 3D surface models
Dental-occlusal relationship evaluation	Image registration
Developmental Disorders of the Craniofacial Complex	Quantitative measurements
Orofacial clefting	
Holoprosencephaly	**Model Surgery**
Fetal alcohol syndrome	Principles and techniques
Ectodermal dysplasia	Stages of model surgery
Pierre Robin syndrome	Isolated mandibular surgery
Hemifacial microsomia	Isolated maxillary or bimaxillary surgery
Treacher Collins syndrome	Dental impressions, facebow record and occlusal registration
Nager syndrome	Transferring the maxillary model to the articulator
Miller syndrome	Articulating the mandibular model to themaxillary model
Craniosynostoses	Maxillary movement
Non-syndromic craniosynostosis	Mandibular movement
Syndromic craniosynostoses: Apert, Crouzon and Pfeiffer	Construction of the occlusal wafer splints
Muenke syndrome	Virtual model surgery
Saethre–Chotzen syndrome	**Smile Aesthetics: Specific Considerations in the Orthognathic Patient**
Craniofrontonasal syndrome	Alignment of the teeth
Obstructive Sleep Apnoea Syndrome	Sagittal position and inclination of the maxillary incisors
Orthodontic and Orthognathic Surgery	The visibility of the dentition in the vertical and transverse dimension
Preparatory and Postoperative Orthodontics: Principles, Techniques and Mechanics	The smile line and arc
Preoperative orthodontics	The buccal corridors
Types of orthodontic appliance	Symmetry and Dental midlines
Objectives of preoperative orthodontics	Maxillary cants
Preparation for the preoperative ‘joint clinic’	**Perioperative Considerations and Anesthesia for Orthognathic Surgery**
Intraoperative orthodontic requirements	Preoperative assessment
Postoperative orthodontics	Intraoperative care
Working archwires	Postoperative care
Kobayashi ligatures	
Intermaxillary working elastics	**Orthognathic Surgical Techniques**
Orthodontic ‘salvage’	Le Fort I Osteotomy and Maxillary Advancement,
Space closure	Total Maxillary Set-Back Osteotomy,
Root ‘paralleling’	Sagittal Split Osteotomy and Mandibular Advancement
Orthodontic settling and finishing	Mandibular Set-Back Procedures

Retention	Surgical Correction of Vertical Maxillary Excess (VME)
Principles of Orthognathic Treatment Planning	Surgical Management of Vertical Maxillary Deficiency (VMD),
Preoperative diagnosis	Surgical Correction of Skeletal Anterior Open Bite: Segmental Maxillary Surgery,
Chair side techniques to aid clinical diagnosis	Surgical Correction of Anterior Open Bite: Differential Posterior Maxillary Impaction,
Skeletal expansion vs. contraction and effects on the overlying soft tissues	Surgical Treatment of Anterior Open Bite with Mandibular Osteotomies
Rotation of the Maxillomandibular Complex	**Stability of Orthognathic Surgery**
Specific Considerations in the 'Low Angle' Patient,	Double jaw orthognathic surgery
Osseous Genioplasty	**Management of Select Complications in Orthognathic Surgery**
Asymmetries of the Maxilla and Mandible	Orthodontic factors
Temporomandibular Joint Replacement Surgery in the Orthognathic Patient	Poor and/or inadequate bracket placement
Surgically Assisted Rapid Maxillary Expansion	Bolton discrepancy
Segmental Surgery of the Maxilla	Inappropriate transverse therapy
Contemporary Approach to Surgical Timing in Orthognathic Surgery: 'Surgery First' concept,	Segmental vs. continuous archwire
Mandibular Intraoral Distraction Osteogenesis	Communication between the orthodontist and the surgeon, 375
Postoperative Care, Nutritional Support and Oral Hygiene in the Orthognathic Surgical Patient,	Maxillary surgery
Ward-based care	Ramping in maxillary advancement surgery
Nutritional support	Avoidance of the use of large pterygoid chisel to
Oral hygiene measures	achieve pterygomaxillary separation
Brushing techniques for the orthognathic	Serious bleeding after Le Fort I osteotomy
Adjunctive chemotherapeutic agents	Mandibular surgery
The Soft Tissue Effects of Orthognathic Surgery	Mandibular body ostectomy
The immediate response to orthognathic surgery	Sagittal split ramus osteotomy (SSRO)
Soft tissue changes with maxillary surgery,	SSRO and third molars
Soft tissue changes with mandibular surgery	**Orthognathic Surgery in the Cleft Patient and Orthognathic Aspects of Craniofacial Surgery**
Early Orthognathic Surgery: Considerations for Surgical Management	**Orthognathic Surgery in the Patient with Cleft Lip and Palate**
Diagnostic and General considerations	Dental/periodontal health and tooth
Jaw growth considerations	Maxillary surgery
TMJ considerations	Segmental surgery
Habitual considerations	Maxillary horseshoe osteotomy
Mandibular deformities	Distraction osteogenesis
Mandibular hypoplasia retrognathism	Management of hard palate fistulas at the time of cleft orthognathic surgery
Mandibular retrognathism with TMJ disorders	Adjunctive surgery to improve facial contouring
Mandibular hyperplasia/prognathism	Following orthognathic procedures
Mandibular osteotomy techniques for growing patients	Retention and outcomes
Inverted 'L' osteotomy (ILO), and vertical ramus osteotomy (VRO)	Psychological input
TMJ high condylectomy	Speech and language input
TMJ low condylectomy	**Craniofacial Asymmetry: Causes and Management,**
Maxillary deformities	Causes and classification of craniofacial asymmetry
Maxillary anteroposterior hypoplasia	Evaluation and assessment
Maxillary vertical deformities	Principles of symmetry reconstruction
Maxillary osteotomy techniques for growing patients	Treatment

Name of the Doctoral School	SZTE Doctoral School of Clinical Medicine
Subject group name: (* subprogram = specialization)	Clinical and experimental research in restorative and organ-sparing surgery
Name of the course	KODI-KLI-11 **Clinical maxillofacial consultations**
Name of organizational unit (responsible department):	Department of Oral and Maxillofacial Surgery
Name of the instructor in charge of the subject	**Prof. Dr. Dr. Piffkó József**
Subject email address:	office.maxillo@med.u-szeged.hu
Recommended admission to the course 1-4. semester:	1, 3
Exact course date:	Tuesday 2-4 p.m.
Course location:	SZTE SZAKK, Department of Oral and Maxillofacial Surgery
** Hours per week:	2
** Total number of hours per semester :	28
** credits :	6
Requirement type (method of fulfillment): five-grade report or colloquium	colloquium
Course recordings max. number:	2
Course advertising department :	SZTE SZAKK Department of Oral and Maxillofacial Surgery
Exam Type: oral and / or written	Oral
Instructors of the course:	Prof. Dr. Dr. Piffkó József Ph.D. Dr. Segatto Emil Ph.D. Dr. Sáfrány-Fárk Árpád Ph.D.
Thematics: subject topics by week	week 1 Clinical patient material analysis, practical implementations week 2 Clinical patient material analysis, practical implementations week 3 Clinical patient material analysis, practical implementations week 4 Clinical patient material analysis, practical implementations week 5 Clinical patient material analysis, practical implementations week 6 Clinical patient material analysis, practical implementations week 7 Clinical patient material analysis, practical implementations week 8 Clinical patient material analysis, practical implementations week 9 Clinical patient material analysis, practical implementations week 10 Clinical patient material analysis, practical implementations week 11 Clinical patient material analysis, practical implementations week 12 Clinical patient material analysis, practical implementations week 13 Clinical patient material analysis, practical implementations week 14 Clinical patient material analysis, practical implementations
Recommended reading:	Szabó György: Szájsebészet, maxillofaciális sebészet Semmelweis Kiadó, 2004, ISBN: 9639214361 https://www.tankonyvtar.hu/hu/tartalom/tamop412A/2011-0032_magyar/adatok.html

7. STUDY ON THE PATHOMECHANISMS AND THERAPEUTIC POSSIBILITIES OF DIFFERENT PEDIATRIC DISEASES PhD programProgramme Director: Prof. Dr. **Program Director: Prof. Dr. Márta Katona** KODI-CHDIS

To be announced later.

8. DENTAL MEDICINE *(Research in Dental Medicine)* PhD program KODI-DENTA
Programme Director: Prof. Dr. Melinda Madléna

Methodological Problems and Protocols in the Scientific Examination of Intraoral Diseases KODI-DENTA-02 (Coordinator: Dr. Márk Antal, 28 hours, 6 credits, final exam)

Modern Methods and Materials in Prosthetic Dentistry KODI-DENTA-03 (Coordinator: Dr. Márta Radnai, 28 hours, 6 credits, final exam)

9. TRANSLATIONAL MEDICINE PhD program KODI-TRANS
Programme Director: Prof. Dr. Zoltán Rakonczay

HCEMM PhD course (Translational medicine: from bench to bedsite and back again) KODI-TRANS-05 (Coordinator: Prof. Dr. Lajos Kemény. 28 hours, 6 credits, end-semester exam)

Advanced biostatistics KODI-TRANS-14 (Coordinator: Prof. Dr. Zoltán Rakonczay, II. semester; 2 credits 10 hours, practice) From 2025-26/II. semester).

Basic and advanced clinical pharmacology KODI-TRANS-17 (Coordinator: Prof. Dr. Zoltán Rakonczay, II. semester; 2 credits 10 hours, practice) From 2025-26/II. semester).

Basic and intermediate biostatistics KODI-TRANS-13 (Coordinator: Prof. Dr. Zoltán Rakonczay, I. semester; 2 credits 10 hours, practice) From 2025-26/I. semester).

Clinical trials KODI-TRANS-15 (Coordinator: Prof. Dr. Zoltán Rakonczay, I. semester; 2 credits 10 hours, practice) From 2025-26/I. semester).

Group meetings and workshops I. KODI-TRANS-09 (Coordinator: Prof. Dr. Zoltán Rakonczay, I. semester; 2 credits 10 hours, practice) From 2025-26/I. semester).

Group meetings and workshops II. KODI-TRANS-10 (Coordinator: Prof. Dr. Zoltán Rakonczay, II. semester; 2 credits 10 hours, practice) From 2025-26/II. semester).

Patient registries in medical science and clinical practice KODI-TRANS-16 (Coordinator: Prof. Dr. Zoltán Rakonczay, I. semester; 2 credits 10 hours, practice) From 2025-26/I. semester).

Presentation technique workshop I. KODI-TRANS-07 (Coordinator: Prof. Dr. Zoltán Rakonczay, I. semester; 2 credits 10 hours, practice) From 2025-26/I. semester).

Presentation technique workshop II. KODI-TRANS-08 (Coordinator: Prof. Dr. Zoltán Rakonczay, II. semester; 2 credits 10 hours, practice) From 2025-26-/II. semester).

Scientific writing in translational medicine KODI-TRANS-18 (Coordinator: Prof. Dr. Zoltán Rakonczay, II. semester; 2 credits 10 hours, practice) From 2025-26/II. semester).

Soft skills I. KODI-TRANS-11 (Coordinator: Prof. Dr. Zoltán Rakonczay, I. semester; 2 credits 10 hours, practice) From 2025-26/I. semester).

Soft skills II. KODI-TRANS-12 (Coordinator: Prof. Dr. Zoltán Rakonczay, II. semester; 2 credits 10 hours, practice) From 2025-26/II. semester).

Systematic review and meta-analysis I. KODI-TRANS-05 (Coordinator: Prof. Dr. Zoltán Rakonczay, I. semester; 2 credits 10 hours, practice) From 2025-26/I. semester).

Systematic review and meta-analysis II. KODI-TRANS-06 (Coordinator: Prof. Dr. Zoltán Rakonczay, II. semester; 2 credits 10 hours, practice) From 2025-26/II. semester).

Doktori Iskola neve:	SZTE Klinikai Orvostudományi Doktori Iskola
Tárgycsoport neve: (*alprogram=szakirány)	**Transzlációs medicina**
Tárgy (kurzus) neve:	**HCEMM PhD course: Translational medicine: from bench to bedsite and back again.**
Szervezeti egység neve (felelős tanszék):	SZTE ÁOK Bőrgyógyászati és Allergológiai Klinika
Tárgyfelelős oktató neve:	**Dr. Kemény Lajos** tanszékvezető egyetemi tanár, az MTA lev. tagja
Tárgyfelelős e-mail címe:	kemeny.lajos@med.u-szeged.hu
Kurzus előfeltétele:	-
Kurzus meghirdetése: (2020-2021. tanév őszi szemeszter – I. félév vagy tavaszi szemeszter – II. félév)	őszi félév (2020-2021-es tanév I. félévtől kezdődően). Kötelezően választható az SZTE Klinikai Orvostudományi Doktori Iskola Transzlációs medicina alprogram nappali tagozatos PhD hallgatói számára. Szabadon választható más alprogramok és doktori iskolák hallgatói számára. Magyar és külföldi PhD hallgatóknak egyaránt.
Kurzus javasolt felvétele 1-4. félév közül:	
Kurzus pontos időpontja:	**egyéni megbeszélés szerint, tömbösítve**
Kurzus helyszíne:	**online**
**Heti óraszám:	2
**Összes óraszám félévente:	**28 óra**
**Kreditpont:	**6 kredit**
Követelmény típus (teljesítés módja): ötfokozatú beszámoló vagy kollokvium	ötfokozatú beszámoló
Kurzus felvételek max. száma:	1
Kurzushirdető tanszék:	SZTE ÁOK Bőrgyógyászati és Allergológiai Klinika
Kurzus típusa:	**előadás (angol nyelven)**
Vizsgatípus: szóbeli és/vagy írásbeli	szóbeli
A kurzus oktatói:	Dr. Kemény Lajos, Dr. Hegyi Péter, Dr. Szentesi Andrea, Dr. Széll Márta, Dr. Szabó Kornélia, Dr. Papp Balázs, Dr. Kintses Bálint, Dr. Enyedi Balázs, Dr. Maléth József, Dr. Bata Zsuzsanna, Dr. Dinnyés András, Dr. Veréb Zoltán, Dr. Haracska Lajos, Dr. Németh István Balázs, Dr. Markó-Varga György, Dr. Groma Gergely, Dr. Buzás Edit, Dr. Buzás Krisztina, Dr. Manczinger Máté, Dr. Horváth Péter, Dr. Duda Ernő.
Tematika: tantárgy tematika heti bontásban	1) Kemény Lajos/Hegyi Péter/Szentesi Andrea: Introduction. What is translational medicine? From basic research to the bedsite. 2) Széll Márta/Szabó Kornélia: Genomic and metagenomic studies in translational medicine. Gene therapy. Host - microbe interactions in health and disease. 3) Papp Balázs/Kintses Bálint: Understanding and overcoming antibiotic resistance.

	4) Enyedi Balázs: Mechanisms of tissue damage induced inflammation 5) Maléth József/Bata Zsuzsanna: Translational research in gastroenterology and skin diseases 6) Dinnyés András/Veréb Zoltán: Stem cell biology in basic research and diseases. Cell-based therapies: advanced therapy medicinal products 7) Haracska Lajos: Genomic instability and cancer 8) Németh István Balázs: What can we learn from a pathologist? Tumor microenvironment organization. 9) Markó-Varga György/Groma Gergely: Proteomics in clinical discovery and in personalized medicine. 10) Buzás Edit/Buzás Krisztina: Microvesicles in healths and disease 11) Manczinger Máté: Big data and personalized medicine. Drug repurposing - two for the price of one. 12) Horváth Péter: Arteficial intelligence in translational medicine 13) Markó-Varga György/Veréb Zoltán: Biobanking and the future of translational medicine 14) Kemény Lajos/Duda Ernő: Patenting or publishing? How to start a small business? The ultimate goal of molecular medicine research is to translate the scientific findings and results to putative clinical applications – as closely to human conditions as possible. access to human data, biological samples of patients, as well as a relatively easy path to clinical trials and drug development. This course will provide an insight on how basic research data can be impolemented into the clinics.
Ajánlott irodalom:	

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged
Course: **Advanced biostatistics**
Academic year/Semester: **2025-2026/2**
Educator and contact details (e-mail): Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu
Lecturers/practice teachers: Andrea Harnos, Péter Fehérvári, Gergely Agócs
Type of course: lecture/seminar/practice/laboratory
Total contact hours: 10
Credit value of the course: 2

Type of examination: final exam at the end of semester, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program, completion of the “Translational medicine: basic and intermediate biostatistics” course
Purpose of course: This course gives a deeper insight of those elements of probability theory and statistics which are necessary for the understanding of meta-analysis and registry analysis. We discuss descriptive statistics and the logic of inferential statistics, point and interval estimates, Popper's theory of falsification. We conceptually introduce the hypothesis tests, significance, p-value, and error types. We cover parametric and nonparametric tests, the basics of multivariate analysis and diagnostic tests.
Outcome requirements of the course (specific academic results to be established by the course): Students will be able to: • Understand the role of statistics in medical research. • Apply probability and risk measures. • Classify and describe different types of data. • Summarize data using descriptive statistics. • Make estimates and test hypotheses. • Use parametric and nonparametric tests. • Analyze qualitative, correlated, and regression data. • Interpret survival and diagnostic test results.
Topics: a. Why to learn statistics? b. Probabilities I-II. c. Risks, Odds, Ratios d. Random variables e. Basic concepts f. Data types g. Descriptive statistics h. Estimation i. Hypothesis testing j. Tests of means and variances k. Nonparametric tests l. Analysis of qualitative data m. Correlation analysis n. Regression analysis o. Survival analysis p. Diagnostic tests
Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.
Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: Biostatistics: A Foundation for Analysis in the Health Sciences by Wayne W. Daniel and Chad L. Cross, 2018

Indicating course requirements on CooSpace scene (summary)

Description (public):

This course gives a deeper insight of those elements of probability theory and statistics which are necessary for the understanding of meta-analysis and registry analysis. We discuss descriptive statistics and the logic of inferential statistics, point and interval estimates, Popper's theory of falsification. We conceptually introduce the hypothesis tests, significance, p-value, and error types. We cover parametric and nonparametric tests, the basics of multivariate analysis and diagnostic tests.

Requirements:

Outcome requirements of the course:
By the end of the course, students will be able to:

- Understand the role of statistics in medical research.
- Apply probability and risk measures.
- Classify and describe different types of data.
- Summarize data using descriptive statistics.
- Make estimates and test hypotheses.
- Use parametric and nonparametric tests.
- Analyze qualitative, correlated, and regression data.

Interpret survival and diagnostic test results.

Requirements:
Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical sessions.

Examination requirements:
The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.

Topics:

a. Why to learn statistics?
b. Probabilities I-II.
c. Risks, Odds, Ratios
d. Random variables
e. Basic concepts
f. Data types
g. Descriptive statistics
h. Estimation
i. Hypothesis testing
j. Tests of means and variances
k. Nonparametric tests
l. Analysis of qualitative data
m. Correlation analysis
n. Regression analysis
o. Survival analysis
p. Diagnostic tests

Supporting methods to achieve learning outcomes:
The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.

Mandatory reading list: -

Recommended reading list:
Biostatistics: A Foundation for Analysis in the Health Sciences" by Wayne W. Daniel and Chad L. Cross, 2018

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged

Course: **Basic and advanced clinical pharmacology**

Academic year/Semester: **2025-2026/2**
Educator and contact details (e-mail): Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu
Lecturers/practice teachers: Péter Hegyi, Szilárd Váncsa, Rita Nagy, Marie Engh, Brigitta Teutsch, Alexander Schulze Wenning, Mahmoud Obeidat, Anett Rancz
Type of course: lecture/seminar/practice/laboratory
Total contact hours: 10
Credit value of the course: 2
Type of examination: final exam at the end of semester, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program
Purpose of course: The course aims to provide PhD students with a comprehensive understanding of clinical pharmacology as a translational scientific discipline.
Outcome requirements of the course (specific academic results to be established by the course): Participants will gain an understanding of fundamental pharmacological concepts, including pharmacokinetics, pharmacodynamics, toxicology, drug discovery, and the design of clinical study protocols. They will also explore advanced topics such as clinical trial methodology, medical device development, gene therapy, pharmacovigilance, and the role of software in clinical trials—building on knowledge from other translational medicine courses.
Topics: 1. Pharmacokinetics 2. Pharmacodynamics and toxicology 3. Drug development 4. Clinical study protocol design 5. Medical devices. 6. Clinical developments, clinical trials in the field of medical devices and medical softwares 7. Advanced therapy medicinal products 8. Pharmacovigilance
Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.
Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical teaching sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: Basic and Clinical Pharmacology by Bertram Katzung. MCGRAW HILL EDUCATION & MEDIC, 2023

Indicating course requirements on CooSpace scene (summary)

Description (public): This course provides a foundation in clinical pharmacology as a translational scientific discipline focused on rational drug development and utilization in therapeutics. The course focuses on the following core principles of pharmacology: pharmacokinetics, pharmacodynamics and toxicology; drug discovery and development and clinical study protocol design. Furthermore, the course will cover advanced clinical trial concepts like medical device development, advanced therapy medicinal products (e.g. gene therapy), clinical trial and software development in clinical trials, and basics of pharmacovigilance. This course intends to complement the other courses of the translational research

teaching program so that participants will have a broad and in-depth overview of the mainstream methodologies of clinical research.
Requirements: Outcome requirements of the course: Participants will gain an understanding of fundamental pharmacological concepts, including pharmacokinetics, pharmacodynamics, toxicology, drug discovery, and the design of clinical study protocols. They will also explore advanced topics such as clinical trial methodology, medical device development, gene therapy, pharmacovigilance, and the role of software in clinical trials—building on knowledge from other translational medicine courses. Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Topics: 1. Pharmacokinetics 2. Pharmacodynamics and toxicology 3. Drug development 4. Clinical study protocol design 5. Medical devices. 6. Clinical developments, clinical trials in the field of medical devices and medical softwares 7. Advanced therapy medicinal products 8. Pharmacovigilance The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos. Mandatory reading list: - Recommended reading list: Basic and Clinical Pharmacology by Bertram Katzung. MCGRAW HILL EDUCATION & MEDIC, 2023

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged
Course: **Basic and intermediate biostatistics**
Academic year/Semester: **2025-2026/1**
Educator and contact details (e-mail): Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu
Lecturers/practice teachers: Andrea Harnos, Mikolt Bakony, Ráka Tóth, Bence Szabó, Szilvia Kiss-Dala, Ádám Zolcsák, Anna Walter
Type of course: lecture/seminar/practice/laboratory
Total contact hours: 10
Credit value of the course: 2
Type of examination: final exam at the end of semester, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program
Purpose of course: In today's data-driven world, having a solid understanding of statistics is essential for making informed decisions, conducting research, and interpreting the world around us. We guide participants through fundamental statistical concepts and techniques, including data collection, descriptive statistics, probability, hypothesis testing, correlation, regression, survival analysis, diagnostic tests,

and study designs. Our goal is to present these topics in an accessible and engaging way, helping participants fully understand and apply the material.
Outcome requirements of the course (specific academic results to be established by the course): Students completing the course must be able to apply biostatistical techniques to analyze data from medical and biological research contexts. They should be capable of interpreting and critically evaluating statistical results presented in medical and biological literature. Students will gain experience working with real-world data sets and examples, enabling them to relate theoretical knowledge to practical, research-based scenarios. Participants should develop the ability to formulate research questions, choose appropriate statistical tools, and draw valid conclusions based on data analysis.
Topics: a. Basic concepts b. Data types c. Descriptive statistics d. Mean and median e. Estimation f. Probability g. Diagnostic tests h. Hypothesis testing i. Basic tests of means j. Correlation k. Regression l. Adjusting m. Study design n. Clinical trial o. Survival analysis
Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.
Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: Biostatistics: A Foundation for Analysis in the Health Sciences by Wayne W. Daniel and Chad L. Cross, 2018

Indicating course requirements on CooSpace scene (summary)

Description (public): In today's data-driven world, having a solid understanding of statistics is essential for making informed decisions, conducting research, and interpreting the world around us. We guide participants through fundamental statistical concepts and techniques, including data collection, descriptive statistics, probability, hypothesis testing, correlation, regression, survival analysis, diagnostic tests, and study designs. Our goal is to present these topics in an accessible and engaging way, helping participants fully understand and apply the material.
Outcome requirements of the course: Students completing the course must be able to apply biostatistical techniques to analyze data from medical and biological research contexts. They should be capable of interpreting and critically evaluating statistical results presented in medical and biological literature. Students will gain experience working with real-world data sets and examples, enabling them to relate theoretical knowledge to practical, research-based scenarios. Participants should develop the ability to formulate

research questions, choose appropriate statistical tools, and draw valid conclusions based on data analysis.

Requirements:
Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical sessions.
Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.

Topics:
a. Basic concepts
b. Data types
c. Descriptive statistics
d. Mean and median
e. Estimation
f. Probability
g. Diagnostic tests
h. Hypothesis testing
i. Basic tests of means
j. Correlation
k. Regression
l. Adjusting
m. Study design
n. Clinical trial
o. Survival analysis

Supporting methods to achieve learning outcomes:
The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.

Mandatory reading list: -

Recommended reading list: Biostatistics: A Foundation for Analysis in the Health Sciences" by Wayne W. Daniel and Chad L. Cross, 2018

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged

Course: **Clinical trials**

Academic year/Semester: **2025-2026/1**

Educator and contact details (e-mail): Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu

Lecturers/practice teachers:
Péter Hegyi, Szilárd Váncsa, Rita Nagy, Marie Engh, Brigitta Teutsch, Alexander Schulze Wenning, Mahmoud Obeidat, Anett Rancz

Type of course: lecture/seminar/practice/laboratory

Total contact hours: 10

Credit value of the course: 2

Type of examination: final exam at the end of semester, practice exam, other:……..

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course):
Participation in the translational medicine training program

Purpose of course:

The goal of the course is to help students understand the strengths and limitations of clinical trials, develop the ability to formulate and address relevant clinical questions, and learn to critically assess scientific literature.

Outcome requirements of the course (specific academic results to be established by the course):
Students completing the course will be able to:

- Explain the role of clinical research/trials in translational medicine and evidence-based practice.
- Identify and formulate clinical research questions and hypotheses.
- Distinguish between different types of clinical study designs, including observational (cohort, case-control, cross-sectional, descriptive) and interventional studies.
- Recognize and assess potential biases in both observational and interventional research.
- Understand the principles of randomization, blinding, intervention types, and clinical endpoints.
- Interpret and apply basic statistical concepts used in clinical research, including data types, sample size calculations, and analysis strategies (e.g., intention-to-treat vs. per-protocol).
- Critically evaluate the strength and quality of clinical evidence, including the grading of evidence levels.
- Interpret study results and assess their relevance for clinical practice and future research planning.

Topics:
1. The role of clinical research in translational medicine
2. The role of clinical research in clinical practice and evidence-based medicine
3. Introduction: types, structure, questions, and hypothesis in clinical research
4. Observational studies I.: analytical studies, cohort, case-control, cross-sectional studies
5. Observational studies II.: descriptive studies
6. Observational studies II.: risk of bias in observational studies
7. Differences between observational and interventional studies
8. Interventional studies I.: randomization, blinding
9. Interventional studies II.: types of intervention, endpoints
10. Statistics in clinical research I.: types of data
11. Statistics in clinical research II.: sample size calculation, intention-to-treat and per-protocol analyses, subgroups
12. Interventional studies III.: risk of bias
13. Grading of evidence
14. Interpreting results in clinical practice and further research planning

Supporting methods to achieve learning outcomes:
The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.

Evaluation of the acquisition of expected learning outcomes:
Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical sessions.
Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.

Mandatory reading list: -

Recommended reading list:
Fundamentals of Clinical Trials" by Lawrence M. Friedman et al. Springer International Publishing AG, 2015

Indicating course requirements on CooSpace scene (summary)

Description (public):

This course provides an in-depth introduction to clinical research, with a focus on understanding the design, implementation, and evaluation of clinical trials and observational studies. Students will explore the role of clinical research in translational medicine and evidence-based practice, learning how to formulate relevant clinical questions and choose appropriate study designs. Key topics include types of clinical studies, bias assessment, randomization, blinding, clinical endpoints, and statistical principles such as sample size calculation and data analysis strategies. The course also covers how to critically evaluate scientific literature, grade the quality of evidence, and interpret findings in the context of clinical practice and future research. By the end of the course, students will have a solid foundation in clinical research methodology and its application to real-world healthcare challenges.

Requirements:
Students completing the course can:

- Explain the role of clinical research/trials in translational medicine and evidence-based practice.
- Identify and formulate clinical research questions and hypotheses.
- Distinguish between different types of clinical study designs, including observational (cohort, case-control, cross-sectional, descriptive) and interventional studies.
- Recognize and assess potential biases in both observational and interventional research.
- Understand the principles of randomization, blinding, intervention types, and clinical endpoints.
- Interpret and apply basic statistical concepts used in clinical research, including data types, sample size calculations, and analysis strategies (e.g., intention-to-treat vs. per-protocol).
- Critically evaluate the strength and quality of clinical evidence, including the grading of evidence levels.
- Interpret study results and assess their relevance for clinical practice and future research planning.

Evaluation of the acquisition of expected learning outcomes:
Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical sessions.

Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.

Topics:
1. The role of clinical research in translational medicine
2. The role of clinical research in clinical practice and evidence-based medicine
3. Introduction: types, structure, questions, and hypothesis in clinical research
4. Observational studies I.: analytical studies, cohort, case-control, cross-sectional studies
5. Observational studies II.: descriptive studies
6. Observational studies II.: risk of bias in observational studies
7. Differences between observational and interventional studies
8. Interventional studies I.: randomization, blinding
9. Interventional studies II.: types of intervention, endpoints
10. Statistics in clinical research I.: types of data
11. Statistics in clinical research II.: sample size calculation, intention-to-treat and per-protocol analyses, subgroups
12. Interventional studies III.: risk of bias
13. Grading of evidence
14. Interpreting results in clinical practice and further research planning"

Supporting methods to achieve learning outcomes:
The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.

Mandatory reading list: - Recommended reading list: Fundamentals of Clinical Trials" by Lawrence M. Friedman et al. Springer International Publishing AG, 2015

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged
Course: **Group meetings and workshops I.**
Academic year/Semester: **2025-2026/1**
Educator and contact details (e-mail): Dr. Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu
Type of course: lecture/seminar/practice/laboratory
Total contact hours: 10
Credit value of the course: 2
Type of examination: final exam at the end of semester, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program
Purpose of course: The course aims to deepen students' understanding of translational medicine through a combination of workshops and group meetings. Students will enhance both their theoretical knowledge and practical skills by engaging with e-learning content and participating in collaborative discussions. The course is designed exclusively for TM PhD program students, with active faculty involvement to guide the learning process.
Outcome requirements of the course (specific academic results to be established by the course): By the end of the course, students will be able to deliver concise, high-quality presentations on complex translational medicine topics using advanced communication techniques. They will demonstrate the ability to critically analyze and defend their research under expert questioning and engage in meaningful peer and group discussions that foster collaborative learning. Students will apply rigorous research methodology, respond effectively to feedback from experts, supervisors, and peers, and show clear progression across course blocks. They will also reflect on their performance to identify areas for growth and refine their professional communication to effectively engage diverse audiences.
Topics: This course features a blend of group meetings and workshops designed to enhance both theoretical understanding and practical application of translational medicine concepts. Workshops: These sessions will allow students to delve deeper into their theoretical knowledge, complementing e-learning materials. Students are required to attend workshops corresponding to each set of e-learning content. The specific dates for these workshops will be communicated following the completion of the admission process. Group Meetings: Held weekly, these meetings are essential for discussing ongoing projects and ensuring collaborative learning and problem-solving. The active involvement of the supervising faculty is crucial to guide discussions and provide expert insights. Detailed scheduling and additional course logistics will be provided upon successful admission.
Supporting methods to achieve learning outcomes: The course uses case-based learning, interactive seminars, and hands-on workshops to develop advanced research and presentation skills. Teaching methods: Learning is supported through structured feedback loops, reflective practice, and progressively challenging tasks tailored to student development. Continuous peer and supervisor input, along with real-time guidance from experts, reinforces professional communication, critical thinking, and research methodology.

Evaluation of the acquisition of expected learning outcomes: Requirements: The practical grade (on a three-point scale) will be based on the attendance and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: -

Indicating course requirements on CooSpace scene (summary)

Description (public): This course is exclusively available to students enrolled in the Translational Medicine (TM) PhD program. It features a blend of group meetings and workshops designed to enhance both theoretical understanding and practical application of translational medicine concepts. Workshops: These sessions will allow students to delve deeper into their theoretical knowledge, complementing e-learning materials. Students are required to attend workshops corresponding to each set of e-learning content. The specific dates for these workshops will be communicated following the completion of the admission process. Group Meetings: Held weekly, these meetings are essential for discussing ongoing projects and ensuring collaborative learning and problem-solving. The active involvement of the supervising faculty is crucial to guide discussions and provide expert insights.
Requirements: Expected outcome requirements (specific learning outcomes to be acquired by completing the course): By the end of the course, students will be able to deliver concise, high-quality presentations on complex translational medicine topics using advanced communication techniques. They will demonstrate the ability to critically analyze and defend their research under expert questioning and engage in meaningful peer and group discussions that foster collaborative learning. Students will apply rigorous research methodology, respond effectively to feedback from experts, supervisors, and peers, and show clear progression across course blocks. They will also reflect on their performance to identify areas for growth and refine their professional communication to effectively engage diverse audiences. Evaluation of the acquisition of expected learning outcomes: Requirements: The practical grade (on a three-point scale) will be based on the attendance and the performance at the practical sessions.
Topics: This course features a blend of group meetings and workshops designed to enhance both theoretical understanding and practical application of translational medicine concepts. Workshops: These sessions will allow students to delve deeper into their theoretical knowledge, complementing e-learning materials. Students are required to attend workshops corresponding to each set of e-learning content. The specific dates for these workshops will be communicated following the completion of the admission process. Group Meetings: Held weekly, these meetings are essential for discussing ongoing projects and ensuring collaborative learning and problem-solving. The active involvement of the supervising faculty is crucial to guide discussions and provide expert insights. Detailed scheduling and additional course logistics will be provided upon successful admission." Supporting methods to achieve learning outcomes: The course uses case-based learning, interactive seminars, and hands-on workshops to develop research and presentation skills. Mandatory reading list: - Recommended reading list: -

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged
Course: **Group meetings and workshops II.**
Academic year/Semester: **2025-2026/2**
Educator and contact details (e-mail): Dr. Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu
Type of course: lecture/seminar/practice/laboratory
Total contact hours: 10
Credit value of the course: 2
Type of examination: final exam at the end of semester, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program, completion of the Translational medicine group meetings and workshops I. course
Purpose of course: The course aims to deepen Translational Medicine PhD students' presentation and research skills through advanced case presentations, in-depth discussions, and expert feedback. It focuses on enhancing communication, collaboration, and critical thinking while refining presentation techniques and research methodology.
Outcome requirements of the course (specific academic results to be established by the course): By the end of the course, students will be able to deliver concise, high-quality presentations on complex translational medicine topics using advanced communication techniques. They will demonstrate the ability to critically analyze and defend their research under expert questioning and engage in meaningful peer and group discussions that foster collaborative learning. Students will apply rigorous research methodology, respond effectively to feedback from experts, supervisors, and peers, and show clear progression across course blocks. They will also reflect on their performance to identify areas for growth and refine their professional communication to effectively engage diverse audiences.
Topics: This course is designed to provide in-depth group meetings and specialized workshops for students engaged in the Translational Medicine PhD program. It builds on foundational skills to offer a deeper exploration of complex topics, advanced collaborative techniques, and enhanced feedback mechanisms. Advanced Sessions Include: Complex Case Presentations: Students will present detailed reports on specific cases or research findings, emphasizing depth, analysis, and advanced presentation skills. Each presentation is limited to 10 minutes to focus on concise and powerful communication. In-depth Discussion: Following each presentation, there will be a 5-minute session where course leaders and supervisors pose challenging, in-depth questions aimed at testing the presenter’s knowledge and ability to defend their research and methodology. Strategic Collaboration Time: An open discussion period where peers engage in critical inquiry and debate for 5 minutes, promoting a deeper understanding of the topic and fostering a collaborative learning environment. Expert Feedback: Direct feedback from the course leader will focus on advanced aspects of presentation skills, such as data visualization, storytelling in science, and engaging diverse audiences. Supervisory Insights: Supervisors provide specialized feedback, focusing on enhancing the professional relevance and impact of the presentations. Peer Feedback Mechanism: Advanced peer review sessions are conducted to offer constructive criticism and support, helping participants refine their presentation and research skills. Reflective Discussion and Follow-up: The course includes a comprehensive review session at the end of each block, where feedback and development areas from the first sessions are discussed and refined. The subsequent block adjusts to include new challenges based on previous feedback, ensuring progressive learning and improvement.

Supporting methods to achieve learning outcomes: The course uses case-based learning, interactive seminars, and hands-on workshops to develop advanced research and presentation skills. Teaching methods: Learning is supported through structured feedback loops, reflective practice, and progressively challenging tasks tailored to student development. Continuous peer and supervisor input, along with real-time guidance from experts, reinforces professional communication, critical thinking, and research methodology.
Evaluation of the acquisition of expected learning outcomes: Requirements: The practical grade (on a three-point scale) will be based on the attendance and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: -

Indicating course requirements on CooSpace scene (summary)

Description (public):
This course offers advanced group meetings and workshops for Translational Medicine PhD students, building on foundational skills to explore complex topics and advanced techniques.
Advanced Sessions Include:
Complex Case Presentations: Students present detailed reports on specific cases, focusing on analysis and concise communication (10 minutes).
In-depth Discussion: A 5-minute session for course leaders and supervisors to pose challenging questions, testing knowledge and methodology.
Strategic Collaboration Time: A 5-minute open discussion for peers to engage in critical inquiry and deepen understanding.
Expert Feedback: Feedback on advanced presentation skills, including data visualization, storytelling, and audience engagement.
Supervisory Insights: Supervisors provide specialized feedback on the professional relevance and impact of presentations.
Peer Feedback: Constructive peer reviews to refine presentation and research skills.
Reflective Discussion and Follow-up: A review session to discuss feedback, refine skills, and incorporate new challenges for continuous improvement.

Requirements:
Outcome requirements of the course (specific academic results to be established by the course):
By the end of the course, students will be able to deliver concise, high-quality presentations on complex translational medicine topics using advanced communication techniques. They will demonstrate the ability to critically analyze and defend their research under expert questioning and engage in meaningful peer and group discussions that foster collaborative learning. Students will apply rigorous research methodology, respond effectively to feedback from experts, supervisors, and peers, and show clear progression across course blocks. They will also reflect on their performance to identify areas for growth and refine their professional communication to effectively engage diverse audiences.

Evaluation of the acquisition of expected learning outcomes:
Requirements: The practical grade (on a three-point scale) will be based on the attendance and the performance at the practical sessions.

Topics:

This course is designed to provide in-depth group meetings and specialized workshops for students engaged in the Translational Medicine PhD program. It builds on foundational skills to offer a deeper exploration of complex topics, advanced collaborative techniques, and enhanced feedback mechanisms.

Advanced Sessions Include:
Complex Case Presentations: Students will present detailed reports on specific cases or research findings, emphasizing depth, analysis, and advanced presentation skills. Each presentation is limited to 10 minutes to focus on concise and powerful communication.
In-depth Discussion: Following each presentation, there will be a 5-minute session where course leaders and supervisors pose challenging, in-depth questions aimed at testing the presenter’s knowledge and ability to defend their research and methodology.
Strategic Collaboration Time: An open discussion period where peers engage in critical inquiry and debate for 5 minutes, promoting a deeper understanding of the topic and fostering a collaborative learning environment.
Expert Feedback: Direct feedback from the course leader will focus on advanced aspects of presentation skills, such as data visualization, storytelling in science, and engaging diverse audiences.
Supervisory Insights: Supervisors provide specialized feedback, focusing on enhancing the professional relevance and impact of the presentations.

Peer Feedback Mechanism: Advanced peer review sessions are conducted to offer constructive criticism and support, helping participants refine their presentation and research skills.
Reflective Discussion and Follow-up: The course includes a comprehensive review session at the end of each block, where feedback and development areas from the first sessions are discussed and refined. The subsequent block adjusts to include new challenges based on previous feedback, ensuring progressive learning and improvement.

Supporting methods to achieve learning outcomes: The course uses case-based learning, interactive seminars, and hands-on workshops to develop advanced research and presentation skills.

Mandatory reading list: -

Recommended reading list: -

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged

Course: **Patient registries in medical science and clinical practice**

Academic year/Semester: **2025-2026/1**

Educator and contact details (e-mail): Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu

Lecturers/practice teachers: Péter Hegyi, Szilárd Váncsa, Rita Nagy, Marie Engh, Brigitta Teutsch, Alexander Schulze Wenning, Mahmoud Obeidat, Anett Rancz

Type of course: lecture/seminar/practice/laboratory

Total contact hours: 10

Credit value of the course: 2

Type of examination: final exam at the end of semester, practice exam, other:……..

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course):
Participation in the translational medicine training program

Purpose of course:
The course aims to familiarize students with the benefits and limitations of patient registries, as well as the techniques used for registry data analysis.

Outcome requirements of the course (specific academic results to be established by the course):
By the end of this course, students will be able to:

- Understand the role of patient registries in translational medicine and evidence-based clinical practice.
- Identify the benefits and limitations of using patient registry data for research and clinical decision-making.
- Design the key components of a patient registry, including defining case report forms (CRFs), obtaining ethical approval, and planning registry structure.
- Recognize and apply methods to minimize bias in the development and use of patient registries.
- Use electronic case report forms (eCRFs) and understand the practical aspects of data collection and management.
- Manage the ongoing operation of a patient registry, including patient enrollment, data quality assessment, and engagement strategies (e.g., patient clubs).
- Organize and analyze registry data, including formatting, creating data tables, and conducting basic analyses using tools like Excel.
- Generate hypotheses and visually present registry data results for interpretation and communication.
- Develop a publication strategy based on registry findings.
- Apply registry data to clinical practice and plan further research based on real-world evidence.

Topics: 1. The role of patient registries in translational medicine, interdisciplinary work-groups 2. The role of patient registries in clinical practice and evidence-based medicine 3. Initiating patient registries I.: Bias and preventing bias in patient registries 4. Initiating patient registries II.: Case report forms (CRF) 5. Initiating patient registries III.: Overview of the registry, final approval, translation 6. Initiating patient registries IV.: Ethical approval 7. Initiating patient registries V.: Electronic case report forms (eCRF) 8. Maintaining patient registries I.: enrollment 9. Maintaining patient registries II.: data acquisition, data-quality assessment 10. Maintaining patient registries III.: patient clubs 11. Data: data tables, formatting, analysis. Basic Excel-training 12. Hypothesis generating, visual representation of the results 13. Publication strategy 14. Use of the results in clinical practice and research planning"
Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with quizzes to assess their understanding and exercises to help them practice the concepts covered in the videos.
Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the quiz prior to attending the live practical sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the quizzes and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: "Registries for Evaluating Patient Outcomes: A User's Guide" by Agency for Healthcare Research and Quality (AHRQ), 2020. https://effectivehealthcare.ahrq.gov/products/registries-guide-4th-edition/users-guide

Indicating course requirements on CooSpace scene (summary)

Description (public): This course offers students a practical introduction to the structure and operation of patient registries. Participants will explore the roles and responsibilities of the personnel involved, the IT infrastructure supporting the registry, and key topics such as data management, ethical approval, and the integration of biobanks. Emphasizing hands-on learning, the course includes practical exercises that build on the theoretical content. Students will complete these tasks during the course and present their findings in a brief oral presentation at the end of the program.
Requirements: By the end of this course, students will be able to: • Understand the role of patient registries in translational medicine and evidence-based clinical practice. • Identify the benefits and limitations of using patient registry data for research and clinical decision-making. • Design the key components of a patient registry, including defining case report forms (CRFs), obtaining ethical approval, and planning registry structure. • Recognize and apply methods to minimize bias in the development and use of patient registries. • Use electronic case report forms (eCRFs) and understand the practical aspects of data collection and management.

- Manage the ongoing operation of a patient registry, including patient enrollment, data quality assessment, and engagement strategies (e.g., patient clubs).
- Organize and analyze registry data, including formatting, creating data tables, and conducting basic analyses using tools like Excel.
- Generate hypotheses and visually present registry data results for interpretation and communication.
- Develop a publication strategy based on registry findings.
- Apply registry data to clinical practice and plan further research based on real-world evidence.

Evaluation of the acquisition of expected learning outcomes:
Requirements: Participants are expected to watch the e-learning videos and complete the quiz prior to attending the live practical sessions.

Examination requirements: The practical grade (on a three-point scale) will be based on the results of the quizzes and the performance at the practical sessions.

Topics:
1. The role of patient registries in translational medicine, interdisciplinary work-groups
2. The role of patient registries in clinical practice and evidence-based medicine
3. Initiating patient registries I.: Bias and preventing bias in patient registries
4. Initiating patient registries II.: Case report forms (CRF)
5. Initiating patient registries III.: Overview of the registry, final approval, translation
6. Initiating patient registries IV.: Ethical approval
7. Initiating patient registries V.: Electronic case report forms (eCRF)
8. Maintaining patient registries I.: enrollment
9. Maintaining patient registries II.: data acquisition, data-quality assessment
10. Maintaining patient registries III.: patient clubs
11. Data: data tables, formatting, analysis. Basic Excel-training
12. Hypothesis generating, visual representation of the results
13. Publication strategy
14. Use of the results in clinical practice and research planning

Supporting methods to achieve learning outcomes:
The students will have access to detailed lessons through e-learning videos, along with quizzes to assess their understanding and exercises to help them practice the concepts covered in the videos.

Mandatory reading list: -

Recommended reading list: "Registries for Evaluating Patient Outcomes: A User's Guide" by Agency for Healthcare Research and Quality (AHRQ), 2020. https://effectivehealthcare.ahrq.gov/products/registries-guide-4th-edition/users-guide

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged
Course: **Presentation technique workshop I.**
Academic year/Semester: **2025-2026/1**
Educator and contact details (e-mail): Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu
Practice teachers: Péter Hegyi, Mahmoud Obeidat
Type of course: lecture/seminar/practice/laboratory
Total contact hours: 10
Credit value of the course: 2
Type of examination: final exam at the end of semester, practice exam, other:……..

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program
Purpose of course: The course aims to teach students scientific presentation skills. It focuses on helping them present their work clearly and confidently. Practical exercises and feedback are key components of the course. Closely aligned with the core courses of the translational medicine program, the course encourages students to present interim results from their PhD research, applying the methodological knowledge they have acquired. This process provides valuable opportunities for receiving professional feedback to support their academic and research development.
Outcome requirements of the course (specific academic results to be established by the course): Students will develop and demonstrate enhanced presentation skills specific to scientific and translational medicine contexts. By participating in structured peer-reviewed presentations and receiving targeted feedback from faculty and peers, students will be able to present their research progress clearly, respond to professional inquiries effectively, and critically evaluate both their own and others' presentation techniques. Emphasis will be placed on clarity, confidence, methodological rigor, and the integration of feedback to improve future scientific communication.
Topics: Students enrolled in the course participate in group-based practical sessions, where they present their work and engage in mutual evaluation. Each session is structured as follows: 1. A 10-minute presentation by each student on their scientific progress and research findings. 2. A 5-minute focused discussion, during which the course leader and supervisors pose professional questions. 3. A 5-minute open discussion, allowing peers to ask relevant academic questions. 4. Constructive feedback from the course leader. 5. Evaluation by the course leader and supervisors, emphasizing presentation technique and scientific relevance. 6. Peer-to-peer feedback among students. Each feedback session is followed by a group discussion to reinforce learning points. Successful course completion is based primarily on demonstrated improvement in the areas identified during feedback and evaluation.
Supporting methods to achieve learning outcomes: A combination of practical, feedback-driven, and reflective methods is used. These include structured peer presentations, guided discussions, formative feedback from instructors and peers, workshops on presentation techniques, and self-assessment all aimed at improving clarity, confidence, and professionalism in scientific communication.
Evaluation of the acquisition of expected learning outcomes: Requirements: The participants are expected to prepare and deliver their presentations and engage meaningfully with the course content and activities. Examination requirements: The practical grade (on a three-point scale) will be based on the attendance and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: The Craft of Scientific Presentations: Critical Steps to Succeed and Critical Errors to Avoid by Michael Alley, 2013, Springer

Indicating course requirements on CooSpace scene (summary)

Description (public):

This course is designed to help PhD students enhance their scientific presentation skills in a supportive, practice-oriented environment. Through structured group sessions, students will present their research progress, receive professional and peer feedback, and refine their delivery techniques. Emphasis is placed on clear communication, confident public speaking, and effective visual presentation of scientific data. The course is closely aligned with the translational medicine curriculum and supports students in developing the skills needed for academic conferences, thesis defenses, and interdisciplinary collaboration.

Requirements:
Outcome requirements of the course:
Students will develop and demonstrate enhanced presentation skills specific to scientific and translational medicine contexts. By participating in structured peer-reviewed presentations and receiving targeted feedback from faculty and peers, students will be able to present their research progress clearly, respond to professional inquiries effectively, and critically evaluate both their own and others' presentation techniques. Emphasis will be placed on clarity, confidence, methodological rigor, and the integration of feedback to improve future scientific communication.

Evaluation of the acquisition of expected learning outcomes:
Requirements: The participants are expected to prepare and present their presentations and engage meaningfully with the course content and activities.
Examination requirements: The practical grade (on a three-point scale) will be based on the attendance and the performance at the practical sessions.

Topics:
Students enrolled in the course participate in group-based practical sessions, where they present their work and engage in mutual evaluation. Each session is structured as follows:
1. A 10-minute presentation by each student on their scientific progress and research findings.
2. A 5-minute focused discussion, during which the course leader and supervisors pose professional questions.
3. A 5-minute open discussion, allowing peers to ask relevant academic questions.
4. Constructive feedback from the course leader.
5. Evaluation by the course leader and supervisors, emphasizing presentation technique and scientific relevance.
6. Peer-to-peer feedback among students.
Each feedback session is followed by a group discussion to reinforce learning points. Successful course completion is based primarily on demonstrated improvement in the areas identified during feedback and evaluation.

Supporting methods to achieve learning outcomes:
A combination of practical, feedback-driven, and reflective methods is used. These include structured peer presentations, guided discussions, formative feedback from instructors and peers, workshops on presentation techniques, and self-assessment all aimed at improving clarity, confidence, and professionalism in scientific communication.

Mandatory reading list: -
Recommended reading list: Michael Alley. The Craft of Scientific Presentations: Critical Steps to Succeed and Critical Errors to Avoid, 2013, Springer.

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged

Course: **Presentation technique workshop II.**

Academic year/Semester: **2025-2026/2**

Educator and contact details (e-mail): Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu

Practice teachers: Péter Hegyi, Mahmoud Obeidat

Type of course: lecture/seminar/practice/laboratory

Total contact hours: 10
Credit value of the course: 2
Type of examination: final exam at the end of semester, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program, completion of the Translational medicine presentation technique workshop I. course
Purpose of course: This intermediate course is designed to help PhD students further improve their presentation skills by fostering clear and impactful communication of their research. It offers opportunities to present their work, receive constructive feedback, and engage in dialogue with peers and supervisors. Emphasis is placed on mastering effective presentation techniques and incorporating critical feedback to enhance overall delivery.
Outcome requirements of the course (specific academic results to be established by the course): This course builds on the foundational presentation skills developed in the initial workshop, aiming to further strengthen Translational Medicine PhD students' ability to effectively communicate their research. As a core component of the compulsory PhD course series, it focuses on advancing presentation techniques with particular emphasis on clarity and impact.
Topics: **Evolving Scientific Presentations:** Students will deliver 10-minute presentations on the ongoing progress of their research, with a focus on improving clarity, structure, and overall impact. Facilitated Q&A Sessions: Each presentation will be followed by a 5-minute moderated discussion led by course instructors and supervisors, featuring targeted questions to explore the scientific content and presentation decisions more deeply. **Peer-Led Discussion:** A 5-minute open forum will follow, encouraging peer engagement through detailed questions and discussion to deepen understanding and promote interactive learning. **Focused Instructor Feedback:** Course leaders will provide individualized feedback, addressing key elements such as visual aids, speech clarity, delivery style, and audience connection. **Supervisor Insights:** Supervisors will offer strategic feedback aimed at helping students contextualize their research within broader academic and real-world frameworks. **Peer Feedback Exchange:** Students will be encouraged to provide constructive feedback to one another, fostering a collaborative environment for mutual improvement in presentation skills. **Reflection and Future Planning:** The session concludes with a structured reflection period, where students review feedback and set goals for continued development of their presentation abilities.
Supporting methods to achieve learning outcomes: A combination of practical, feedback-driven, and reflective methods is used. These include structured peer presentations, guided discussions, formative feedback from instructors and peers, workshops on presentation techniques, and self-assessment all aimed at improving clarity, confidence, and professionalism in scientific communication.
Evaluation of the acquisition of expected learning outcomes: Requirements: The participants are expected to prepare and deliver their presentations and engage meaningfully with the course content and activities.

Examination requirements: The practical grade (on a three-point scale) will be based on the attendance and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: The Craft of Scientific Presentations: Critical Steps to Succeed and Critical Errors to Avoid by Michael Alley, 2013, Springer

Indicating course requirements on CooSpace scene (summary)

Description (public): This course builds on the foundational presentation skills developed in the initial workshop, aiming to further strengthen Translational Medicine PhD students' ability to effectively communicate their research. As a core component of the compulsory PhD course series, it focuses on advancing presentation techniques with particular emphasis on clarity and impact.
Evaluation of the acquisition of expected learning outcomes: Requirements: The participants are expected to prepare and present their presentations and engage meaningfully with the course content and activities. Examination requirements: The practical grade (on a three-point scale) will be based on the attendance and the performance at the practical sessions.
Topics: **Evolving Scientific Presentations:** Students will deliver 10-minute presentations on the ongoing progress of their research, with a focus on improving clarity, structure, and overall impact. Facilitated Q&A Sessions: Each presentation will be followed by a 5-minute moderated discussion led by course instructors and supervisors, featuring targeted questions to explore the scientific content and presentation decisions more deeply. **Peer-Led Discussion:** A 5-minute open forum will follow, encouraging peer engagement through detailed questions and discussion to deepen understanding and promote interactive learning. **Focused Instructor Feedback:** Course leaders will provide individualized feedback, addressing key elements such as visual aids, speech clarity, delivery style, and audience connection. **Supervisor Insights:** Supervisors will offer strategic feedback aimed at helping students contextualize their research within broader academic and real-world frameworks. **Peer Feedback Exchange:** Students will be encouraged to provide constructive feedback to one another, fostering a collaborative environment for mutual improvement in presentation skills. **Reflection and Future Planning:** The session concludes with a structured reflection period, where students review feedback and set goals for continued development of their presentation abilities. Supporting methods to achieve learning outcomes: A combination of practical, feedback-driven, and reflective methods is used. These include structured peer presentations, guided discussions, formative feedback from instructors and peers, workshops on presentation techniques, and self-assessment all aimed at improving clarity, confidence, and professionalism in scientific communication. Mandatory reading list: -

Recommended reading list: Michael Alley. The Craft of Scientific Presentations: Critical Steps to Succeed and Critical Errors to Avoid, 2013, Springer.

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged
Course: **Scientific writing in translational medicine**
Academic year/Semester: **2025-2026/2**
Educator and contact details (e-mail): Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu
Lecturers/practice teachers: Péter Hegyi, Szilárd Váncsa, Rita Nagy, Marie Engh, Brigitta Teutsch, Alexander Schulze Wenning, Mahmoud Obeidat, Anett Rancz
Type of course: lecture/seminar/practice/laboratory
Total contact hours: 10
Credit value of the course: 2
Type of examination: final exam at the end of semester, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program, completion of the Systematic review and meta-analysis in science and clinical practice I. course.
Purpose of course: The course aims to teach the fundamentals of scientific writing, focusing on the precision, clarity, and economy required to communicate research effectively. It emphasizes the importance of accurately conveying technical information, particularly in clinical research methodologies. In addition to writing research papers, the course also covers grant application writing, equipping students with the skills needed for successful funding proposals.
Outcome requirements of the course (specific academic results to be established by the course): By the end of the course, students will be able to: • Apply principles of clarity, precision, and conciseness in scientific writing. • Draft key sections of a scientific manuscript, including Introduction, Methods, Results, and Discussion. • Clearly communicate clinical research methodologies and findings. • Write effective abstracts, titles, and manage references properly. • Edit and revise scientific texts for improved quality and accuracy. • Understand the basics of grant writing and develop core components of a funding proposal.
Scientific writing is not just writing about science; it is the technical writing that scientists do to communicate their research to others. Scientific writing is predicated on the rigors of scientific inquiry, so it must reflect the same precision as that demanded in the research process. Scientific communication demands precision (the precise use of words and phrases), clarity, and economy. This distinction is an important one because the writer is communicating highly technical information to others who might, or might not, be as knowledgeable. Many journals have international audiences, so precise communication helps prevent misunderstandings and mistranslations in other contexts. Communicating facts, figures, and methods used in research—as well as the description of the results—has to be precise. The eLearning component includes interactive lessons and practical exercises, guiding participants through the process of drafting each section of a scientific manuscript. Topics: Introduction – Framing the research question and background Methods – Describing study design, data collection, and analysis Results – Presenting data with clarity and accuracy Discussion – Interpreting findings and discussing limitations Abstract and Title – Summarizing the study concisely and effectively

References and Supplementary Material – Managing citations and appendices
Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.
Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical teaching sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: Joshua Schimel. Writing Science: How to Write Papers That Get Cited and Proposals That Get Funded. Oxford University Press, 2011.

Indicating course requirements on CooSpace scene (summary)

Description (public): Scientific writing is essential for effectively communicating clinical research, especially in systematic reviews and meta-analyses. This course focuses on the principles of clear, precise, and structured scientific writing, tailored to the needs of clinical researchers. While our primary focus is on article writing for systematic reviews and meta-analyses, we also address other key study designs including RCTs, cohort studies, and diagnostic accuracy research. Scientific writing is not just writing about science; it is the technical writing that scientists do to communicate their research to others. Scientific writing is predicated on the rigors of scientific inquiry, so it must reflect the same precision as that demanded in the research process. Scientific communication demands precision (the precise use of words and phrases), clarity, and economy. This distinction is an important one because the writer is communicating highly technical information to others who might, or might not, be as knowledgeable. Many journals have international audiences, so precise communication helps prevent misunderstandings and mistranslations in other contexts. Communicating facts, figures, and methods used in research—as well as the description of the results—has to be precise. Therefore in our course, we aim to give an insight into the basics of scientific writing, focusing on clinical research methodologies. Scientific writing is also important when applying for a grant therefore, in the second part of the course we intend to focus on grant applications.
Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical teaching sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Topics: Introduction – Framing the research question and background Methods – Describing study design, data collection, and analysis Results – Presenting data with clarity and accuracy Discussion – Interpreting findings and discussing limitations Abstract and Title – Summarizing the study concisely and effectively References and Supplementary Material – Managing citations and appendices Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos. Mandatory reading list: -

Recommended reading list: Joshua Schimel. Writing Science: How to Write Papers That Get Cited and Proposals That Get Funded. Oxford University Press, 2011.

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged
Course: **Soft skills I.**
Academic year/Semester: **2025-2026/1**
Educator and contact details (e-mail): Dr. Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu
Lecturers/practice teachers: Péter Hegyi, Szilárd Váncsa, Rita Nagy, Marie Engh, Brigitta Teutsch, Alexander Schulze Wenning, Mahmoud Obeidat, Anett Rancz
Type of course: lecture/seminar/practice/laboratory
Total contact hours: 10
Credit value of the course: 2
Type of examination: final exam at the end of semester, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program
Purpose of course: This course is designed to help PhD students develop essential soft skills that are critical for success both within academia and in broader professional contexts. It focuses on core competencies such as public speaking, effective communication, time management, critical thinking, and personal and professional development strategies. Strengthening these skills will enhance students' performance in research, presentations, and teamwork, while also improving their adaptability and employability across various career paths.
Outcome requirements of the course (specific academic results to be established by the course): By the end of this course, PhD students will be able to: • Deliver clear and confident presentations, effectively engaging academic and professional audiences. • Communicate proficiently in both written and verbal forms, with strong interpersonal and collaborative skills. • Apply effective time management techniques to balance academic, research, and personal responsibilities. • Demonstrate critical and analytical thinking in problem-solving, decision-making, and research-related tasks. • Adopt strategies for personal and professional growth, including goal setting, adaptability, and lifelong learning. • Enhance their overall effectiveness and employability in diverse academic and professional settings through improved soft skills.
Topics: This course is designed to develop the essential soft skills PhD students need to succeed in both academic and professional environments. Each module focuses on a critical area of personal and professional growth, recognizing that while soft skills are often overlooked in technical fields, they are vital for effectively presenting research, collaborating across disciplines, and leading projects. **Public Speaking and Presentation Skills** This module equips students with techniques for delivering clear, engaging, and confident presentations. It covers audience engagement, logical structure, and effective communication—essential skills for academic talks, teaching, and professional events. **Communication Skills** Students will build proficiency in written and verbal communication, with a focus on interpersonal skills, professional correspondence, and collaborative work. These skills are fundamental for research, networking, and successful teamwork.

Time Management This section introduces practical strategies for managing time and responsibilities. Topics include setting priorities, managing deadlines, and minimizing procrastination—skills that are key to balancing research, coursework, and personal life. **Thinking Smart: Critical and Analytical Thinking** This module enhances students' problem-solving and decision-making abilities. It explores logical reasoning, creative thinking, and analytical skills that are essential for addressing complex research challenges. **Secrets of Success** The final module highlights habits and mindsets that contribute to long-term success. Topics include goal setting, adaptability, resilience, and lifelong learning—providing students with tools to navigate both academic and professional landscapes.
Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.
Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical teaching sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: -

Indicating course requirements on CooSpace scene (summary)

Description (public): This course is designed to develop the essential soft skills PhD students need to succeed in both academic and professional environments. It consists of five modules (Public Speaking and Presentation Skills, Communication Skills, Time Management,Thinking Smart and Secrets of Success). Each module focuses on a critical area of personal and professional growth, recognizing that while soft skills are often overlooked in technical fields, they are vital for effectively presenting research, collaborating across disciplines, and leading projects.
Requirements: Outcome requirements of the course (specific academic results to be established by the course): By the end of this course, PhD students will be able to: • Deliver clear and confident presentations, effectively engaging academic and professional audiences. • Communicate proficiently in both written and verbal forms, with strong interpersonal and collaborative skills. • Apply effective time management techniques to balance academic, research, and personal responsibilities. • Demonstrate critical and analytical thinking in problem-solving, decision-making, and research-related tasks. • Adopt strategies for personal and professional growth, including goal setting, adaptability, and lifelong learning. • Enhance their overall effectiveness and employability in diverse academic and professional settings through improved soft skills. Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical teaching sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Topics:

The *Public Speaking and Presentation Skills* module focuses on teaching students how to present their research clearly and confidently. Students will learn how to structure presentations, engage their audience, and deliver their ideas effectively.
The *Communication Skills* module emphasizes clear, persuasive communication in both written and verbal forms. It includes interpersonal communication, professional email etiquette, and effective team collaboration, all essential for research and networking.
In the *Time Management* module, students will learn strategies to balance research, coursework, and personal commitments, including how to prioritize tasks, set goals, and avoid procrastination.
The *Thinking Smart* module enhances critical thinking and problem-solving skills, helping students approach complex research and theoretical problems with effective strategies.
Finally, the *Secrets of Success* module provides strategies for goal setting, resilience, adaptability, and continuous self-improvement, which are key to long-term success.

Supporting methods to achieve learning outcomes:
The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.

Mandatory reading list: -
Recommended reading list: -

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged

Course: **Soft skills II.**

Academic year/Semester**: 2025-2026/2**

Educator and contact details (e-mail): Dr. Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu

Lecturers/practice teachers: Péter Hegyi, Szilárd Váncsa, Rita Nagy, Marie Engh, Brigitta Teutsch, Alexander Schulze Wenning, Mahmoud Obeidat, Anett Rancz

Type of course: lecture/seminar/practice/laboratory

Total contact hours: 10

Credit value of the course: 2

Type of examination: final exam at the end of semester, practice exam, other:……..

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course):
Participation in the translational medicine training program, completion of the Translational medicine soft skill I. course

Purpose of course:
The course aims to enhance PhD students' soft skills, preparing them for leadership roles in academia and industry. It focuses on adaptability, leadership, teambuilding, crisis management, grant writing, and healthcare entrepreneurship, equipping students with practical skills to manage projects, lead teams, and navigate professional challenges.

Outcome requirements of the course (specific academic results to be established by the course):
By the end of the course, PhD students should be able to:

- Demonstrate adaptability and flexibility in managing evolving research goals and working effectively in uncertain or changing environments.
- Apply leadership and management skills to lead teams, make informed decisions, and oversee complex research or industry projects.
- Collaborate effectively in team settings, building strong, respectful, and productive working relationships.
- Anticipate and manage crises, employing strategies for risk assessment, contingency planning, and maintaining performance under pressure.
- Write competitive grant proposals, clearly communicating research significance and aligning proposals with funder requirements.

• Understand and apply basic principles of healthcare entrepreneurship, including business planning, market analysis, and research commercialization.
Topics: Adaptability and Flexibility: This module trains students to thrive in dynamic conditions, adapting to changing research parameters, and shifting project goals effectively. Students learn techniques to remain productive and proactive in the face of unforeseen challenges. Leadership and Management: Focused on cultivating leadership qualities, this session equips students with skills in decision-making, team leadership, and project management. Essential for those aiming to lead research teams or manage large-scale projects. Teambuilding and Collaboration: Students will engage in exercises that emphasize the importance of teamwork in research environments. The module covers strategies for building cohesive teams, fostering mutual respect, and enhancing group productivity. Crisis Prevention and Management: This critical module prepares students to anticipate potential issues and effectively manage crises should they arise. Techniques for risk assessment, crisis response planning, and maintaining composure under pressure are covered. Grant Writing: This module provides hands-on experience in writing grant proposals. Students learn to articulate the significance and impact of their research, tailor proposals to different funding bodies, and understand the nuances of grant applications. Healthcare Entrepreneurship: Introducing principles of entrepreneurship in a healthcare context, this module explores market analysis, business planning, and the commercialization of innovations derived from research.
Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.
Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical teaching sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: -

Indicating course requirements on CooSpace scene (summary)

Description (public): This advanced course is designed to enhance essential soft skills for PhD students, preparing them for leadership roles in both academia and industry. The course covers a variety of topics (Adaptability and Flexibility, Leadership and Management, Teambuilding and Collaboration, Crisis Prevention and Management, Grant Writing, Healthcare Entrepreneurship) to help students thrive in complex professional environments.
Requirements: Outcome requirements of the course (specific academic results to be established by the course): By the end of the course, PhD students should be able to: • Demonstrate adaptability and flexibility in managing evolving research goals and working effectively in uncertain or changing environments. • Apply leadership and management skills to lead teams, make informed decisions, and oversee complex research or industry projects. • Collaborate effectively in team settings, building strong, respectful, and productive working relationships. • Anticipate and manage crises, employing strategies for risk assessment, contingency planning, and maintaining performance under pressure. • Write competitive grant proposals, clearly communicating research significance and aligning proposals with funder requirements. • Understand and apply basic principles of healthcare entrepreneurship, including business planning, market analysis, and research commercialization.

Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical teaching sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Topics: The *Adaptability and Flexibility* module teaches students how to stay productive and proactive despite changing research parameters and unexpected challenges. *Leadership and Management* focuses on decision-making, team leadership, and managing large projects, essential for future research team leaders. The *Teambuilding and Collaboration* module emphasizes effective teamwork, providing strategies for building cohesive teams and enhancing productivity. The *Crisis Prevention and Management* module trains students to anticipate risks and manage crises effectively, including maintaining composure under pressure. The *Grant Writing* module offers hands-on experience in writing compelling grant proposals, teaching students to tailor proposals to different funding bodies. Finally, the *Healthcare Entrepreneurship* module introduces principles of entrepreneurship in healthcare, including market analysis and commercialization of research innovations. Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos. Mandatory reading list: - Recommended reading list: -

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged
Course: **Systematic review and meta-analysis I.**
Academic year/Semester: **2025-2026/1**
Educator and contact details (e-mail): Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu
Lecturers/practice teachers: Péter Hegyi, Mahmoud Obeidat
Type of course: lecture/seminar/practice/laboratory
Total contact hours: 10
Credit value of the course: 2
Type of examination: final exam at the end of semester, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program
Purpose of course: The aim of the course is to explore the strengths and limitations of systematic reviews and meta-analyses, while fostering a critical perspective on interpreting scientific literature.
Outcome requirements of the course (specific academic results to be established by the course): By the end of this course, students will be able to: • Explain the role of meta-analyses in translational medicine and evidence-based clinical practice. • Conduct a systematic literature search using appropriate databases and search strategies. • Formulate clinical research questions using the PICO framework to guide meta-analytic studies.

• Select relevant studies for inclusion in a systematic review based on predefined criteria. • Perform data extraction from selected studies and distinguish between theoretical and practical approaches. • Classify and interpret different types of data used in meta-analyses. • Construct and interpret forest plots to visually summarize results across studies. • Evaluate statistical heterogeneity and understand its implications for meta-analytic conclusions. • Assess the risk of bias in randomized and non-randomized clinical studies using standardized tools (e.g., RoB 2, ROBINS-I, QUIPS, QUADAS). • Critically evaluate the quality of evidence in published meta-analyses and understand the impact of bias on outcomes.
Topics: 1. The role of meta-analyses in translational medicine 2. The role of meta-analyses in clinical practice and evidence-based medicine 3. Systematic literature search I.: databases 4. Systematic literature search I.: search strategies 5. Questions in meta-analyses: PICO framework 6. Selection in systematic reviews 7. Data extraction in systematic reviews I.: theory 8. Data extraction in systematic reviews I.: practice 9. Statistics of meta-analysis I.: type of data 10. Statistics of meta-analysis II.: forest plots 11. Statistics of meta-analysis III.: statistical heterogeneity 12. Risk of bias assessment I. - general considerations, significance of bias 13. Risk of bias assessment II. - assessment of risk of bias in randomized clinical trials (RoB2) 14. Risk of bias assessment III.- assessment of risk of bias in non-randomized clinical trials and clinical research (ROBINS-I, QUIPS, QUADAS)
Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with quizzes to assess their understanding and exercises to help them practice the concepts covered in the videos.
Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the quiz prior to attending the live practical sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the quizzes and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: https://training.cochrane.org/handbook/current

Indicating course requirements on CooSpace scene (summary)

Description (public): This course provides students with both theoretical and practical knowledge of systematic reviews and meta-analyses. Through a combination of online video lectures and hands-on sessions, students will learn how to conduct systematic literature searches, apply selection criteria, extract and analyze data, and assess risk of bias using established tools. Emphasis is placed on understanding the strengths and limitations of these research methods and developing a critical perspective when interpreting scientific literature. The course is practice-oriented, and students will present their individual and group projects at the end of each session and upon course completion.
Outcome requirements of the course (specific academic results to be established by the course): By the end of this course, students will be able to:

- Explain the role of meta-analyses in translational medicine and evidence-based clinical practice.
- Conduct a systematic literature search using appropriate databases and search strategies.
- Formulate clinical research questions using the PICO framework to guide meta-analytic studies.
- Select relevant studies for inclusion in a systematic review based on predefined criteria.
- Perform data extraction from selected studies and distinguish between theoretical and practical approaches.
- Classify and interpret different types of data used in meta-analyses.
- Construct and interpret forest plots to visually summarize results across studies.
- Evaluate statistical heterogeneity and understand its implications for meta-analytic conclusions.
- Assess the risk of bias in randomized and non-randomized clinical studies using standardized tools (e.g., RoB 2, ROBINS-I, QUIPS, QUADAS).
- Critically evaluate the quality of evidence in published meta-analyses and understand the impact of bias on outcomes.

Evaluation of the acquisition of expected learning outcomes:
Requirements: Participants are expected to watch the e-learning videos and complete the quiz prior to attending the live practical sessions.
Examination requirements: The practical grade (on a three-point scale) will be based on the results of the quizzes and the performance at the practical sessions.

Topics:
1. The role of meta-analyses in translational medicine
2. The role of meta-analyses in clinical practice and evidence-based medicine
3. Systematic literature search I.: databases
4. Systematic literature search I.: search strategies
5. Questions in meta-analyses: PICO framework
6. Selection in systematic reviews
7. Data extraction in systematic reviews I.: theory
8. Data extraction in systematic reviews I.: practice
9. Statistics of meta-analysis I.: type of data
10. Statistics of meta-analysis II.: forest plots
11. Statistics of meta-analysis III.: statistical heterogeneity
12. Risk of bias assessment I. - general considerations, significance of bias
13. Risk of bias assessment II. - assessment of risk of bias in randomized clinical trials (RoB2)
14. Risk of bias assessment III.- assessment of risk of bias in non-randomized clinical trials and clinical research (ROBINS-I, QUIPS, QUADAS)

Supporting methods to achieve learning outcomes:
The students will have access to detailed lessons through e-learning videos, along with quizzes to assess their understanding and exercises to help them practice the concepts covered in the videos.

Mandatory reading list: -

Recommended reading list: https://training.cochrane.org/handbook/current

Program: PhD, Translational Medicine, Doctoral School of Clinical Medicine, University of Szeged

Course: **Systematic review and meta-analysis II.**

Academic year/Semester: **2025-2026/2**

Educator and contact details (e-mail): Dr. Zoltán Rakonczay, rakonczay.zoltan@med.u-szeged.hu

Type of course: lecture/seminar/practice/laboratory
Total contact hours: 10
Credit value of the course: 2
Type of examination: final exam at the end of semester, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): Participation in the translational medicine training program, completion of the “Translational medicine systematic review and meta-analysis I.” course
Purpose of course: The aim of the course is to deepen the practical understanding of conducting systematic reviews and meta-analyses. Building on the foundations laid in the first semester, the second-semester module emphasizes evaluating levels of evidence, accurately interpreting and presenting findings, manuscript preparation, and strategies for publication.
Outcome requirements of the course (specific academic results to be established by the course): Students will acquire knowledge in these methodologies, characteristics of systematic reviews and meta-analysis in a scientific and practical manner. The course will be practice-oriented, which will be based on the theoretical background acquired from the online video courses. At the end of the course and each practical session, students will present their group and individual projects.
Topics: 1. Evidence-based medicine I.: heterogeneity, risk of bias, differences in population, statistical strength, funnel plots. 2. Evidence-based medicine II.: A GRADEpro software, SoF tables, and interpretation of evidence 3. Interpretation of results I.: advanced forest-plots 4. Interpretation of results II.: Assessment of heterogeneity, source of heterogeneity, secondary analyses 5. Interpretation of results III.: A Trial Sequential Analysis 6. Interpretation of results IV.: Meta-regression, network meta-analysis, and SUCRA interpretation 7. Writing of the manuscript I.: PRISMA 2020 statement and checklist 8. Writing of the manuscript II.: Methods section 9. Writing of the manuscript III.: Results section and figures 10. Writing of the manuscript IV.: Introduction and discussion of the results, place in the literature 11. Review process of a manuscript based on ELSEVIER 12. Publication strategy I.: Journal selection, manuscript editing 13. Publication strategy II.: Revision, transfer, or rejection of the manuscript 14. Post-publication strategy: Promotion of the results, networking, Cochrane Hungary
Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos.
Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Mandatory reading list: -
Recommended reading list: https://training.cochrane.org/handbook/current

Indicating course requirements on CooSpace scene (summary)

Description (public): Students will gain additional practical knowledge on how to conduct meta-analyses and systematic reviews. The second-semester module is based on the first-semester course, its main focus is on

determining the level of evidence, proper interpretation and presentation of results, article writing, and publication strategy.
Requirements: Students will acquire more advanced knowledge in these methodologies, characteristics of systematic reviews and meta-analysis in a scientific and practical manner. The course will be practice-oriented, which will be based on the theoretical background acquired from the online video courses. At the end of the course and each practical session, students will present their group and individual projects. Evaluation of the acquisition of expected learning outcomes: Requirements: Participants are expected to watch the e-learning videos and complete the MCQs prior to attending the live practical sessions. Examination requirements: The practical grade (on a three-point scale) will be based on the results of the MCQs and the performance at the practical sessions.
Topics: 1. Evidence-based medicine I.: heterogeneity, risk of bias, differences in population, statistical strength, funnel plots. 2. Evidence-based medicine II.: A GRADEpro software, SoF tables, and interpretation of evidence 3. Interpretation of results I.: advanced forest-plots 4. Interpretation of results II.: Assessment of heterogeneity, source of heterogeneity, secondary analyses 5. Interpretation of results III.: A Trial Sequential Analysis 6. Interpretation of results IV.: Meta-regression, network meta-analysis, and SUCRA interpretation 7. Writing of the manuscript I.: PRISMA 2020 statement and checklist 8. Writing of the manuscript II.: Methods section 9. Writing of the manuscript III.: Results section and figures 10. Writing of the manuscript IV.: Introduction and discussion of the results, place in the literature 11. Review process of a manuscript based on ELSEVIER 12. Publication strategy I.: Journal selection, manuscript editing 13. Publication strategy II.: Revision, transfer, or rejection of the manuscript 14. Post-publication strategy: Promotion of the results, networking, Cochrane Hungary Supporting methods to achieve learning outcomes: The students will have access to detailed lessons through e-learning videos, along with MCQs to assess their understanding and exercises to help them practice the concepts covered in the videos. Mandatory reading list: - Recommended reading list: https://training.cochrane.org/handbook/current

10. INFLAMMATORY BOWEL DISEASE PhD program KODI-IBDPR

Programme Director: Prof. Dr. Tamás Molnár

To be announced later.

Module I.c : Elective courses of the Doctoral School

KODI doctoral students are entitled to register for courses offered by other subprograms within the Doctoral School as elective subjects.

In addition, KODI students may also register for courses announced by other doctoral schools of the Faculty of Medicine, University of Szeged (SZTE SZAOK), provided that the respective

doctoral school officially authorizes participation and makes the course available for KODI students.

In the case of studies completed at other faculties or universities, the recognition of previously earned credits may be granted through a credit transfer procedure. Detailed information is provided in ***Annex 3: "Credit Transfer Application."***

Recommended elective courses held by other doctoral schools of the Faculty of Medicine, Unicersity of Szeged:

Clinical Genetics – 1 (Coordinator: Prof. Dr. Márta Széll, Department of Medical Genetics

Courses held by the Faculty of Medicine and recommended for the first 3 semesters:

The theory and practice of animal experiments in medicine – Level A. Lecture: 20 hours, Practice: 20 hours, sum. 40 hours, **9 credits.** Head of the course: Prof. Mihály Boros MD, PhD, DSc. Institute of Surgical Research, Faculty of Medicine, University of Szeged, H-6724 Szeged, Pulcz u. 1, Hungary, Tel: +36-62-545-103, E-mail: boros.mihaly@med.u-szeged.hu

Module II.: Research Activities

Kötelező és megszerezhető kreditek:

-A recommended **minimum of 130 credits** must be earned in this module over eight semesters (30 hours = 1 credit).

-Max. 20 credits can be allocated for 30 hours of research activities in every semester (~30 hours/week). The total number of credits may not exceed 160.

-The maximum number of credits obtainable during the eight semesters is **172 credits**:

experimental research, maximum 20 credits / semester (8*20 credits)
research report, maximum 3 credits, maximum 4 reports / eight semesters.

-Research reports are recommended to be submitted at the end of semesters 2, 4, 6, 8.

-Further elective credits can be allocated for other research activities:

participation at scientific conferences and professional courses, workshops: max. 2 credits each

oral or poster presentation at international conferences, 5 credits each.

Module III.: Teaching activities (optional)

Important: Credits may only be awarded for participation in Hungarian-language teaching activities (such as giving lectures, supervising seminars, grading assignments, or invigilating exams). No credits may be granted for teaching in English or German, as PhD students participating in such courses receive hourly remuneration for their work.

Module IV.:Publication activities (obligatory, continuous)

a) Impact factor based requirements (until 12/31/2023)

-A continuous training criterion: **min. 2publications**, min. **65 credits**, **max. 90 credits**).

-Total number of credit points for publication activity (publications, posters and oral presentations): min. 65 – max. 90 credits.

-Number of publications required for completing the PhD training:

min. 1 publication where the PhD student is the first author

min. 2 original research articles, min. 1 of which is published in a journal with an impact factor and the combined impact factor of the 2 articles has to fulfill the requirements of the PhD program

-Number of credit points may be collected for publication activity:

Article type	Credit points
English article with no IF	20 credits
English article with IF	45 credits
Poster presentation at an international event	5 credits
Oral presentation at an international event*	5 credits
Participation in scientific conferences, courses, workshops	2 credits

**(also if held in Hungary)*

-The number of impact factors to be achieved in the different programs:

	IFs
Immunology	4.0
Dermatology	2.0
Reproductive Health	2.0
Clinical and Experimental Neurosciences	4.0
Experimental and Clinical Investigation of the Cardiovascular System	3.0
Clinical and Experimental Research for Reconstructive and Organ-Sparing Surgery	2.0
Study on the Pathomechanisms and Therapeutic Possibilities of Different Diseases in Children	2.5
Dental Medicine	2.0
Translational Medicine	5,0
Inflammatory bowel disease	4,0

-Regarding the publications, where the PhD student is not the first author, all the other co-authors need to sign an authorization form, in which they authorize the student to include the given paper and its contents in hir/her PhD thesis.

-The first author has to issue a statement authorising the PhD student to include the paper in their thesis.

b) D/Q based requirements (mandatory from 01/01/2024 onwards)

-From 01/01/2024, doctoral candidates' publication activity in degree-awarding procedures will be assessed solely according to the MTMT-listed rating (D) or Scimago Journal Rank (SJR) quartile ranking (Q) of the relevant specialist journals.

-Based on this, a candidate may be admitted to the defense if one of the following conditions is met:

- The candidate has one first-authored, original, D1-classified scientific publication in English, which is used exclusively by the candidate to prepare the dissertation.
- The candidate has one first-authored, original, D1-classified publication in English, part of which is also used by another student for their dissertation. In this case, the candidate must additionally have one complete scientific publication of any classification in English.
- The candidate has one first-authored, original, Q1-classified publication in English, and one complete scientific publication of any classification in English. In the latter, the candidate may appear as a co-author, or an article published in a domestic publication in English may also be accepted.
- The candidate has one first-authored, original, Q2-classified publication in English, and at least two other complete scientific publications of any classification in English. In the latter, the candidate may appear as a co-author, or an article published in a domestic publication in English may also be accepted.
- The candidate has one first-authored, original, Q3-classified publication in English, and three other complete scientific publications of any classification in English. In the latter, the candidate may appear as a co-author, or an article published in a domestic publication in English may also be accepted.

-The same research result may not appear as an independent result in multiple procedures or dissertations. However, in exceptional cases, several students may share the results included in a given first-author main publication if the quantity and significance of the results allow this. This is possible only after individual assessment. For this, an application must be submitted to the KODI Council, detailing precisely how the results will be shared among the students. The sharing must be disclosed to the KODI Council before the first relevant procedure, which may approve the proposal and specify additional publications expected from the candidates. The application and the Council's decision are attached to the candidates' materials by the Doctoral Institute staff and sent to the appointed opponents, who will consider them in their evaluation.

-Starting December 2021, the Doctoral School of Clinical Medicine has defined the types of publications that are not accepted as first-author publications in the degree-awarding procedure:

- Publications with multiple or group authors. Exceptions may be granted by the KODI Council on a case-by-case basis, evaluating the candidate's exact contribution.
- Letters to the editor. The DSCM Council may allow them based on individual assessment and submitted application.
- Short communications. The DSCM Council may allow them based on individual assessment and submitted application.
- Case reports or case studies cannot be counted as main (first-author) publications; they may only be considered as additional publications.
- Meta-analyses may be included as first-author main publications, but are not sufficient alone to fulfill publication requirements. The candidate must also have at least one other original co-authored publication on a related topic.

-In its degree-awarding procedures, the University of Szeged takes into account exclusively the SJR quartile ranking, supplemented by the D1 rating from MTMT. The quartile ranking and rating of individual publications are recorded in the MTMT database.

-For doctoral schools affiliated with the Doctoral Council of Medical and Pharmaceutical Sciences, if a journal receives multiple ratings in multiple categories in a given year, the best ranking value of the journal may be considered.

Signed by Prof. Lajos Kemény

7. Recommended Sample Curriculum

UNIVERSITY OF SZEGED, ALBERT SZENT-GYÖRGYI MEDICAL SCHOOL
DOCTORAL SCHOOL OF CLINICAL MEDICINE

Recommended Curriculum

for full-time students in the 4-year (2+2) program (min. 20, max. 45 credits)

Semester I.		**Semester II.**	
Basic module	6+3 credits	Basic module	6+3+2 credits
Compulsory subjects	6 credits	Compulsory subjects	6 credits
Research activities	20 credits	Research activities	20 credits
		Research report	3 credits
Teaching (optional)	(4 credits)	Teaching (optional)	(4 credits)
Total number of credits:	**35+4 credits**	**Total number of credits**	**40+4 credits**

Total number of credits for Semesters 1 and II: 75+8 credits

Semester III.		**Semester IV.**	
Compulsory subjects	6 credits		
Research activities	20 credits	Research activities	20 credits
		Research report	3 credits
Teaching (optional)	(4 credits)	Teaching (optional)	(4 credits)
Total number of credits:	**26+4 credits**	**Total number of credits:**	**23+4 credits**

Total number of credits for Semesters III. and IV.: 49+8 credits

Minimum 90 credits should be earned in Semesters I–IV to be eligible for taking a **complex examination**.

Semester V.		**Semester VI.**	
Research activities	20 credits	Research activities	20 credits
		Research report	3 credits
Teaching (optional)	(4 credits)	Teaching (optional)	(4 credits)
Total number of credits:	**20+4 credits**	**Total number of credits:**	**23+4 credits**

Total number of credits for Semesters V. and VI: 43+8 credits

Semester VII.		**Semester VIII.**	
Research activities	20 credits	Research activities	20 credits
		Research report	3 credits
Teaching (optional)	(4 credits)	Teaching (optional)	(4 credits)
Total number of credits:	**20+4 credits**	**Total number of credits:**	**23+4 credits**

Total number of credits for Semesters VII. and VIII: 43+8 kredit

SUMMARY			
Semester I-IV. (required min.: 90 credits)		**V-VIII. félév** (required min.: 90 credits)	
with teaching	140	with teaching	214
without teaching	124	without teaching	242

In addition to the above course credits, credits for publications are awarded regardless of the semester. The number of these publication credits ranges from a minimum of **65** to a maximum of **90**.

8. Other Requirements

Accepted Master's Programs: (general medicine, (undivided program), dentistry (undivided program), medical biotechnology, psychology, biology, info-bionics engineering, molecular biology, pharmacy, clinical laboratory research).

1. Preparation of Annual Work Report

Doctoral students are required to prepare an annual work report at the end of each academic year, with a maximum length of one page, summarizing their work for that year. The formal requirements for the annual work report are detailed in Annex 1.

The report must include the following:

-Accurate information about the student and the training subprogram (name, year of study, training form, Neptun code, e-mail address, subprogram name, supervisor's name, research location).

-Courses taken and completed, including the achieved results and corresponding credit points.

-Teaching activities, indicating the number of hours and credit points (including the name and code of the taught course).

-The most important results of the student's research work.

-Presentations delivered (event, location, date, title of presentation, certification, e.g., congress program booklet).

-Published, accepted, or submitted publications.

-The contents of the report, signed by the student, must be verified and signed by the supervisor, who also assigns a five-grade evaluation. The annual report is approved by the Head of the Doctoral School.

2. Foreign Language Proficiency

1. Doctoral students are required to present a state-recognized intermediate-level ("C" type, complex) language examination certificate in English, or a certificate deemed equivalent. The equivalence of language examinations is regulated by government decree. In cases not covered by the decree, the professional opinion of the University's Centre for Foreign Languages must be accepted.

   In programs taught in German for medical and dental students, instructors involved in teaching may choose German instead of English to satisfy the intermediate-level language requirement.

2. For non-native Hungarian foreign citizens, their mother tongue may be accepted as fulfilling one of the foreign language requirements, provided that it meets the language proficiency standards of the respective doctoral school. For these students, Hungarian is also considered a foreign language. Non-native Hungarian foreign citizens must present at least an intermediate-level ("C" type, complex) state language examination certificate in English, or an equivalent

certificate. The equivalence of language examinations is regulated by government decree. In cases not covered by the decree, the professional opinion of the University's Centre for Foreign Languages must be accepted.

3. Requirements for the comprehensive examination (in full-time 2+2 year programs)

(Annex 2: Comprehensive Examination Minutes; Annex 4: Dissertation Report)

Composition of the Comprehensive Examination Committee: The committee shall consist of a minimum of three members, of which at least one-third must be external members (external: not employed by the University of Szeged). No committee member may belong to the same research group or have co-authored publications with the examinee.

1. Chair: a university professor, professor emeritus, or habilitated associate professor at the University of Szeged.
2. Internal member: a faculty member of the University of Szeged holding a doctoral degree (PhD minimum).
3. External member: a faculty member not affiliated with the University of Szeged holding a doctoral degree (PhD minimum).

The Doctoral School, or if applicable, the subprogram or institute, announces 1–2 examination dates, preferably in May–June each year.

Structure and repeatability of the Comprehensive Examination:

a) Theoretical part: a subject-specific examination that replaces the former doctoral qualifying exam. From the mandatory courses of the subprogram, the student selects two subjects/topics for the examination. If unsuccessful, the exam may be repeated once within the same examination period.

b) Dissertation part: a dissertation report covering research conducted in the first two years and planned research for the subsequent two years.

Doctoral students take the comprehensive examination at the end of the fourth semester.

Organizational guidelines and recommendations:

The supervisor must submit a one-page evaluation/recommendation prior to the examination, which may be sent to the examiners in advance for review.

The dissertation report must be submitted in writing, electronically, before the examination and may be provided to examiners in advance for evaluation. Formally, this can be a PowerPoint presentation or a three-page MS Word report. The latter must also be attached to the minutes.

The supervisor may be present during the dissertation part of the comprehensive examination but may not serve as a committee member (cannot ask questions).

The examination may also be conducted online.

Requirements for the Comprehensive Examination Minutes:

In accordance with Government Decree 87/2015 (IV. 9.) implementing certain provisions of Act CCIV of 2011 on National Higher Education >>

The doctoral qualifying examination minutes and comprehensive examination minutes must contain the following mandatory elements:

a) Name and institutional identification number of the higher education institution,

b) Name of the doctoral candidate, student identification number, previous degree level, and professional qualification,

c) Name and instructor identification number of the supervisor,

d) Scientific field and discipline of the degree to be obtained,

e) Questions asked and evaluation of answers during the qualifying/comprehensive examination,

f) Overall evaluation of the qualifying/comprehensive examination,

g) Names, instructor identification numbers, and signatures of the chair and members of the examination committee.

9. Formal Requirements of the Doctoral Dissertation

The dissertation shall be written in English. Its length, including figures, tables, graphs, and the bibliography, must not exceed 50 pages. The dissertation must be submitted in printed form (Times New Roman, font size 12, 1.5 line spacing, 16 × 23 cm text area, or an equivalent format) and bound.

The cover page must include the dissertation title, the author's name, the designation "university doctoral dissertation," and the year of completion.

The internal title page must indicate: the author, the dissertation title, the supervisor/consultant (if any), the place of preparation, the doctoral school, the date of preparation, and the name of the institute where the dissertation was carried out.

On the following page, a list of scientific publications related to the dissertation topic shall be provided, numbered with Roman numerals.

The dissertation must comply, in both content and format, with the standards expected for scientific papers. The various sections of the dissertation (Introduction, Materials and Methods, Results, Discussion, Summary, Acknowledgments, Bibliography) should be proportionate according to the nature of the research topic. References cited in the dissertation should follow the usual citation practices of the field.

For the English-language dissertation, summaries (thesis booklets) must also be prepared in both English and Hungarian.

As annexes, copies of all publications related to the dissertation topic, whether published or accepted for publication, must be included and bound together with the dissertation.

The dissertation shall be submitted in one printed copy; the theses must be prepared electronically in 10–15 pages, in both English and Hungarian. Both the dissertation and the theses must also be submitted in PDF format. During emergency situations such as a pandemic, one printed, bound copy of the dissertation must be submitted, while the dissertation and the English and Hungarian thesis booklets shall be submitted electronically in PDF format to the PhD Secretariat for the defense coordinator.

The doctoral candidate is responsible for ensuring that the dissertation and theses are promptly uploaded to the Doctoral Repository maintained by the Klebelsberg Library immediately after submission of the printed copies. The review process may only begin after this upload.

Simultaneously with the announcement of the defense, the responsible faculty or PhD Secretariat shall upload the composition of the defense committee to the Doctoral Repository >>. The composition of the defense committee must also be indicated on the public defense invitations.

Sample cover page for the dissertation and thesis booklet: Provided separately.

MTMT Registration: PhD candidates are required to register in the MTMT database (Hungarian Scientific Bibliography) and upload their published works with the assistance of the institutional MTMT administrator. For the defense, all articles included in the dissertation must be accessible on the candidate's MTMT record.

10. Appendices

Regulations of the University of Szeged Doctoral School:

CREDITS APPLICABLE IN DOCTORAL TRAINING

1. In the doctoral training program, all study requirements must be expressed in credits (study points). Credits can only be awarded for activities that are completed with a graded evaluation (3- or 5-point scale).

2. During the 48-month training period—which is divided into 8 reporting periods—a total of 240 credits must be accumulated to obtain the final certificate.

3. In each reporting period, a minimum of 20 and a maximum of 45 credits must be earned.

4. If the student participates in partial training at a foreign or other university, the relevant Doctoral School Council may grant an exemption from the above requirement. The credit value of such courses is determined by the Doctoral School Council.

5. At least 130 credits must be earned from research work, which includes literature review, library and archival research, processing of articles, conference participation, poster presentations or talks, and publications.

6. A theoretical course of 2 hours per week (14 weeks per semester) carries 3–6 credits. For courses with different total hours (e.g., intensive courses with external lecturers), credits are awarded proportionally. At least 5 theoretical courses (2 hours per week) must be completed.

7. A minimum of 15 credits from theoretical courses must be accumulated to obtain the absolution certificate.

8. Weekly 1-hour practicals or seminars (over 14 weeks) are worth 1–2 credits. A maximum of 48 credits can be earned from teaching, with a limit of 8 per semester. No credits are awarded for hours for which the doctoral candidate receives an hourly teaching fee.

9. If the school requires the doctoral candidate to report on research progress at departmental or research group seminars, one report may carry 3–5 credits. At least one such report is recommended (e.g., during the 6th reporting period). The Doctoral School Council determines how many such reports are recognized for credit.

10. The doctoral candidate may earn credits for publications and active conference presentations (including posters), provided the results are published in the conference proceedings. Credit allocation depends on the candidate's contribution to the results.

Credits are determined by the relevant Doctoral School Council in agreement with the disciplinary/field-specific doctoral council.

Section 11 § (2): In the health care-oriented higher education training system, credits may be recognized for time spent as a resident or central trainee in programs ensuring faculty succession. According to the doctoral regulations, a maximum of two semesters or 60 credits can be recognized in doctoral training.

11. Credit recognition permitted under government regulations is decided by the Doctoral School Council with the agreement of the relevant disciplinary doctoral council. Such recognition is only possible for doctoral candidates participating in organized training.

12. Credits recognized under the previous point are certified by the doctoral school director, and the acquisition of training credits is verified by the instructor of the theoretical course. The Doctoral School Council determines which credits must be certified by the training/research program leader. Verification of all other credits is the responsibility of the supervisor.

13. Completion of teaching periods is certified by the Dean responsible for scientific affairs of the faculty competent in the relevant scientific discipline, countersigned by the Chair of the Doctoral Council (TDT).

11. Annual Work Report Template

UNIVERSITY OF SZEGED, ALBERT SZENT-GYÖRGYI MEDICAL SCHOOL
DOCTORAL SCHOOL OF CLINICAL MEDICINE

Research report

1. Personal data

Name of PhD Student:	
E-mail address:	
Phone:	
Neptun code:	
Research place:	

2. Data on the Training Programme

Name of programme:	
Research topic:	
Supervisor(s):	
Start of training:	
Type of training:	full time / individual preparation

3. Presentation of Annual Research Activity (hypothesis, methods, most important results, *etc*.). *(Maximum lenght: one page.)*

4. Completed courses

Course code:	Title:	Type:	Lecturer:	Credit:

5. Accepted publications

Title of manuscript, journal:	Authors:	Doi number:	D/Q rank

6. Conferences

Name and location of conference:	Abstract title:	Authors:	Type of presentations (talk/poster)

7. International Mobility

Type of international mobility: *(study abroad period, research collaboration, fellowship, etc)*	**Program name:** *(e.g.. Erasmus, Fulbright, Pannónia Fellowship Programme, EUGLOH etc.)*	**Name and Location of Host Institution:**	**Date:**	**Recognized credits:**

Szeged, [date]

…….	…….
[name, signature] PhD student	[name, signature] témvezető
[e-mail address]	[e-mail address]
[workplace]	[workplace]

_____

Supervisor's evaluation:

Grade:	

Szeged, [date]

	…….
	[name] supervisor

_____

The annual research report is approved / not approved.

Szeged, [date]

	…….
	Prof. Dr. Kemény Lajos head of the Doctoral School of Clinical Medicine

12. Comprehensive Examination Record

Komplexvizsga-jegyzőkönyv

A felsőoktatási intézmény adatai:

Név:	Szegedi Tudományegyetem
Intézményi azonosító szám:	FI 62198

A vizsgázó adatai (doktorjelölt / doktorandusz)

Név:	
Születési név:	
Születési hely, idő:	
Elektronikus hallgatói azonosító: (Neptun azonosító):	

Korábbi végzettség adatai:

Végzettség szintje:	
Szakképzettsége:	

A témavezető(k) adatai:

Név:	
Beosztás:	
Tudományos fokozat:	
Oktatói azonosító száma:	
Egyéni felsőoktatási azonosító (FIR-szám)	
Munkahely:	

A megszerzendő fokozat adatai:

A fokozat tudományterülete: orvos- és egészségtudományok
A fokozat tudományága: klinikai orvostudomány

A vizsga adatai:

Helyszínlebonyolítás módja:	
A vizsga ideje:	

Doktori Iskola:

Doktori iskola neve:	SZTE Klinikai Orvostudományi Doktori Iskola
PhD program (szakirány, alprogram) neve:	
Kutatási téma:	

Képzés típusa:	egyéni felkészülésű

A komplexvizsga-bizottság tagjai

(legalább 3 tag, legalább 1/3 más intézményből

	név	tudomá-nyos fokozat	oktatói azonosító szám	beosztás	munkahely
Elnök					
Tag (külső)					
Tag (belső)					

Elméleti rész

Tárgyak/témakörök megnevezése (legalább 2):	1.
	2.

1.Tárgy/témakör megnevezése:	
Elhangzott kérdések:	1.
	2.
	3.
Szöveges értékelés:.....	

2.Tárgy/témakör megnevezése:	
Elhangzott kérdések:	1.
	2.
	3.
Szöveges értékelés:.....	

Az elméleti rész bizottsági értékelése:
(Értékelési mód: a tagok 0-5 pontos skálán titkosan szavaznak. Megfelelt, ha az átlag≥3 és a tagok többsége legalább 3 pontot adott)

Átlag pontszám:	
Legalább 3 pontos szavazatok száma:	
Eredmény:	megfelelt / nem felelt meg

Disszertációs rész

Szakirodalmi ismeretek szöveges értékelése:.....
.....

.....
.....
.....

Kutatási eredmények szöveges értékelése:.....
.....
.....
.....
.....

Szakirodalmi ismeretek szöveges értékelése:.....
.....
.....
.....
.....

Kutatási, disszertációkészítési tervek szöveges értékelése: .....
.....
.....
.....
.....

Az disszertációs rész bizottsági értékelése:
(Értékelési mód: a tagok 0-5 pontos skálán titkosan szavaznak. Megfelelt, ha az átlag≥3 és a tagok többsége legalább 3 pontot adott)

Átlag pontszám:	
Legalább 3 pontos szavazatok száma:	
Eredmény:	megfelelt / nem felelt meg

A komplex vizsga végeredménye

(Megfelelt, ha mindkét vizsgarész megfelelt. Csak az elméleti részből lehet utóvizsgát kérni.)

Eredmény:	megfelelt / nem felelt meg

.....	.....
(név)	*(név)*
A vizsgabizottság elnöke	A vizsgabizottság tagja

.....
(név)
A vizsgabizottság tagja

Szeged,

Melléklet/útmutató

A **vizsgabizottság** legalább három tagból áll, a tagok legalább egyharmada nem áll foglalkoztatásra irányuló jogviszonyban a doktori iskolát működtető intézménnyel. A vizsgabizottság elnöke az egyetem szakmailag illetékes egyetemi tanára vagy professor emeritusa vagy MTA Doktora címmel rendelkező oktatója, kutatója vagy habilitált docense.

- A vizsgabizottság valamennyi tagja tudományos fokozattal rendelkezik. A vizsgabizottságnak nem lehet tagja a vizsgázó doktorandusz témavezetője. A vizsgabizottság tagjai szakmailag illetékesek, a vizsga tárgyaiban jártas szakemberek.

- **A komplex vizsga elméleti részében** a vizsgázó legalább két tárgyból/témakörből tesz vizsgát

- A vizsgabizottság tagjai a vizsga elméleti és disszertációs részét külön-külön értékelik 0-5 fokozatú skálán. A komplex vizsga sikeres, amennyiben a bizottság tagjainak többsége mindkét vizsgarészt sikeresnek ítéli meg, azokra legalább 3 pontot ad és az átlagos pontszám legalább 3. A komplex vizsga értékelése kétfokozatú, megfelelt, vagy nem megfelelt minősítés lehet.

- A vizsga eredményét a szóbeli vizsga napján ki kell hirdetni. Sikertelen elméleti vizsgarész esetén a vizsgázó az adott vizsgaidőszakban további egy alkalommal megismételheti a vizsgát a nem teljesített tárgy(ak)ból. A vizsga disszertációs része sikertelenség esetén az adott vizsgaidőszakban nem ismételhető.

- A jegyzőkönyv mellékletei:
    - disszertációs beszámoló (vizsgázó készíti és küldi be a vizsga előtt a DI adminisztrátorának
    - témavezető ajánlása/értékelése, amely a kutatási témát is tartalmazza.
    - témavezető, vizsgázó, vizsgabizottsági tagok elérhetősége: név, email cím, telefonszám, munkahely neve és címe.

13. Credit Transfer Request

UNIVERSITY OF SZEGED, ALBERT SZENT-GYÖRGYI MEDICAL SCHOOL
DOCTORAL SCHOOL OF CLINICAL MEDICINE
CREDIT TRANSFER APPLICATION FORM

1. Personal Data

Name of PhD student:	
E-mail address:	
Phone:	
Neptun code:	
Supervisor(s):	
Programme:	
Title of research topic:	

I hereby request the approval of credit transfer for the following course(s):

	Course to be substituted	**Completed course to be accepted for credit transfer**
Course title:		
Name and position of course coordinator:		
Department offering the course:		

Required attachments:

-Course description (syllabus) of the completed course, including detailed curriculum, compulsory readings, contact hours, credit value, assessment type, etc.

-Certification by the responsible instructor of the completed course confirming the date and result of completion.

-Written statement by the responsible instructor of the substituted course confirming that the syllabus and requirements of the completed course are equivalent to those of the substituted one.

Szeged, [date]

……	……
[name, signature] PhD student	[name, signature] supervisor
[e-mail]	[e-mail]
[affiliation]	[affiliation]

The credit transfer application is supported / not supported.

…….	…….
[name, signature] course coordinator of the completed course	[name, signature] course coordinator of the substituted course
[e-mail]	[e-mail]
[affiliation]	[affiliation]

The credit transfer application is *supported / not supported*:	[date]	…….
		Prof. Dr. Lajos Kemény head of the Doctoral School of Clinical Medicine
The credit transfer application is *supported / not supported* by the Council of the Doctoral School of Clinical Medicine:	[date]	…….
		Prof. Dr. Lajos Kemény chair of the Council of the Doctoral School of Clinical Medicine
The credit transfer application is *approved / not approved* by the Doctoral Council of the Faculty of Medicine	[date]	

14. Dissertation Report

UNIVERSITY OF SZEGED, ALBERT SZENT-GYÖRGYI MEDICAL SCHOOL
DOCTORAL SCHOOL OF CLINICAL MEDICINE

DOCTORAL DISSERTATION REPORT

1. Personal data

Name of the applicant:	
E-mail address:	
Phone:	
Neptun code:	
Programme:	
Place of work:	
Position:	
Supervisor(s):	
Title of research topic:	
Date of compex exam:	

The dissertation progress report may be submitted either as a PowerPoint presentation or as a written report.

In the presentation or written summary, the doctoral candidate is expected to describe their scientific activities to date, outline the main directions of their research, and discuss planned future studies.

2. List of scientific outputs directly related to the planned PhD dissertation

– publications

– conference abstracts (oral or poster presentations)

– other

3. Written summary (Maximum length: 3 pages)

Szeged, [date]

…….
name of applicant

15. Descriptions of foundation courses in English for students of the Doctoral Schools of Albert Szent-Györgyi Medical School (09. 2025)

Descriptions of foundation courses in English for students of the Doctoral Schools of Albert Szent-Györgyi Medical School (09. 2025)

Basic Module 1st/subject credit *(min. 38 credit)*													
Basic modul													
Course name and course code	**Name of department coordinator**	**Total number of classic (hours)**	**Requirements**	**Number of credits in semesters**								**Total credits**	**Evaluation**
				1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**		
Computer-assisted research methodology AOKDI-BAS-01	Prof. Dr. Ferenc Peták DSc Department of Medical Physics and Informatics	28	O	-	6	-	-	-	-	-	-	6	B5
Scientific com-munication and publication. Methods, rules, ethics AOKDI-BAS-02	Prof. Dr. Ernő Duda Dsc Department of Medical Biology	14	O	-	3	-	-	-	-	-	-	3	B5
Biostatistics lecture AOKDI-BAS-03	Prof. Dr. Tibor Nyári Dsc Department of Medical Physics and Informatics	28	O	6	-	(6)	-	-	-	-	-	6	B5
Biostatistics practice AOKDI-BAS-04	Prof. Dr. Tibor Nyári Dsc Department of Medical Physics and Informatics	28	O	2	-	(2)	-	-	-	-	-	2	B3
Biomedical ethics AOKDI-BAS-05	Dr. habil. Oguz Kelemen PhD Department of Behavioral Scientes	14	O	-	3	-	-	-	-	-	-	3	B5
Total credit of Basic Modul 1-st				**8**	**12**	(8)	**-**	**-**	**-**	**-**	**-**	**20**	

1 O (Obligatory subject)
2 E (Elective subject)
3 CE (Compulsory elective subject)

Course description
Informing students on course requirements

From September 2025

Program: **PhD day- training for SH students and self-cost students**
Course: **Computer-assisted research methodology**
Course code: **AOKDI-BAS-01**
Academic year/Semester: **2025/26 2nd semester**

Educator and contact details (e-mail):
Prof. Ferenc Peták, email: petak.ferenc@med.u-szeged.hu
Dr. József Tolnai, email: tolnai.jozsef@med.u-szeged.hu

Type of course: lecture/**seminar/practice**/laboratory

Weekly hours of the course: **2**

Credit vale of the course: **6**

Type of examination: **final exam at the end of semester**, practice exam, other:……..

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): **none**

Purpose of course:
The primary aim of this course is to equip PhD students with both practical skills and theoretical knowledge in computer science, covering the entire process from data analysis to scientific publication. Students will gain a comprehensive understanding of how to effectively utilize modern information technologies to support their work in the life sciences.

Outcome requirements of the course (specific academic results to be established by the course):
Knowledge:

- Possesses the knowledge needed to process biomedical data into tables.
- Being familiar with the basic concepts of spreadsheets (relative, absolute, and mixed references, ranges, data import and input, data validation, autofill, charts, filtering, sorting, diagrams, functions, basic statistical solutions, large tables, linear regression, and pivot tables)
- Knows the effective and modern presentation techniques and principles of presentation. Familiar with interactive and none-slide based presentation tools (Prezi, Mentimeter)
- Knows the health data available on the web. Also familiar with the methods of preparing and evaluating online forms.
- Knows the basic typographic concepts for document editing (styles, table of contents, figures and captions, list of figures), and general document editing principles. Understands the use and benefits of reference management software.
- Being familiar with forms and basic concepts of scientific data publication. Knows the information and literature search, and the international scientific life science databases.

Competences:

- Having the skill to solve tasks on health data in a spreadsheet program. Creates charts, graphs, and pivot tables. Sort and filter data. Apply mathematical and statistical functions.
- Able to create appropriate presentations with animations not only in standard slide-based but also in virtual canvas-based and interactive presentation software.
- Able to find data in open health databases. Capable of creating, sharing, and evaluating online forms.
- Creates, modifies, and applies styles in a word processor, inserts figures and captions, generates table of contents and list of figures, creates a bibliography, manages cross-references, and footnotes.
- Able to use basic telemedicine tools, artificial intelligence and 3D printing techniques in the field of medicine.

Attitudes:

- Confidently apply the spreadsheet techniques they have learned. Strives to maintain data integrity, process, and present data accurately.
- Open to the use of familiar presentation techniques and strives to produce consistent-looking, easy-to-follow presentations.
- Confidently perform search and retrieval tasks from open health databases. Confidently create online questionnaires.
- Strives to apply typographic principles to the production of sophisticated and easy-to-follow electronic and paper-based documents.

- Open to telemedicine applications for the use and development of tools.
- Open to the use of artificial intelligence and 3D printing tools to support medical research.

Autonomy and responsibility:

- Independently solve the spreadsheet and data processing tasks arising in his/her profession.
- Creates and presents his/her electronic presentations independently.
- Autonomously solve the search for open biomedical data.
- Independently create and evaluate online questionnaires.
- Solves word processing and document management tasks independently.

Independently can interpret the basic concepts of telemedicine, biomedical applications of artificial intelligence, and 3D printing

Topics:

1. Introduction and fundamentals

- Course objectives, requirements, evaluation, CooSpace, eduID, Office 365, digital environment
- Concept and importance of computational research methodology in life sciences
- Fundamental concepts of computer-based data collection, visualization, and processing

2–6. Processing of biomedical Data

- Data entry options, preprocessing, and error management
- Formulas, functions, sorting, filtering, and basic statistical methods
- Charts, subtotals, pivot tables / summaries
- Scientific data visualization (e.g. Excel, basics of R)
- Role of large language models (LLMs) in data collection, preprocessing, and simple evaluation
- Advanced data processing tools and freely available software

7. Artificial Intelligence in life sciences

- Basic concepts of AI, machine learning, and deep learning
- Practical applications in biomedical and health research

8–9. Scientific data presentation and visualization

- Structure and types of scientific publications
- Graphical presentation of research results (e.g. SigmaPlot)
- Common visualization errors and related ethical considerations

10–11. Scientific presentation design

- Presentation tools (PowerPoint, Prezi, Mentimeter, interactive solutions)
- Content and design principles: structure, message, visual coherence
- Opportunities for AI and LLMs in supporting scientific presentations

12–13. Scientific documentation and reference management

- Advanced text editing: styles, references, automatic table of contents, headers/footers, cross-references
- Integration of figures and diagrams into scientific documents
- Reference management tools: EndNote, Zotero, Mendeley
- AI tools for supporting scientific writing and reference handling
- Creating electronic questionnaires and data collection ethics

14. Information retrieval and research data management

- Use of international databases in life sciences (PubMed, Web of Science, Scopus, etc.)
- Electronic systems for managing scientific communications (ORCID, ResearchGate, Scite)

Supporting methods to achieve learning outcomes:

Lectures and practical demonstrations

- Thematic lectures on the theoretical foundations and practical applications of computational research methodology.
- Instructor-led demonstrations using data analysis and visualization software (Excel, SigmaPlot, PowerPoint, EndNote, etc.).
- Presentation of the operation of artificial intelligence and large language models through concrete research examples.

- Interactive exercises where students perform data entry, preprocessing, error handling, statistical analysis, and data visualization on real research datasets.
- Practical assignments for preparing scientific presentations and manuscripts (e.g. PowerPoint design, inserting EndNote references).
- Use of Mentimeter and similar online tools for interactive polls and knowledge checks.
- Practice tasks and tests shared via the CooSpace platform to reinforce the functions of the software tools introduced in class.
- Literature search reports and exercises involving publication databases.

Case studies and problem solving
- Group analysis and discussion of real-life research scenarios (e.g. data-processing errors, misinterpretation of visualizations, publication ethics dilemmas).
- Discussion of the responsible use of AI tools through examples (e.g. use of LLMs in scientific writing).

Use of digital learning environments
- Document sharing, collaborative editing, and assignment submission through CooSpace and Office 365 platforms.
- eduID-based access to international scientific resources (PubMed, Scopus).
- Controlled and reflective use of online tools (AI chatbots, ChatGPT, ResearchRabbit, etc.) to support the research process.

Evaluation of the acquisition of expected learning outcomes:

Requirements:
Course requirements during the semester
- Active participation in lectures and seminars.
- Independent completion and timely submission of written assignments and the final written examination paper during the semester.

Examination requirements:
Assessment and grading
The performance during the semester is evaluated on a five-point scale (1–5) based on in-class activity, interim assignments, and the final submitted tasks.
- Maximum score achievable in the final examination: 200 points
- Maximum score for mid-semester assignments: 100 points
- Total obtainable points: 300 points

Attendance and active participation in seminars are rewarded with additional bonus points.
Grades of the course are determined as follows:
- 0–139 points: Failed (1)
- 140–179 points: Passed (2)
- 180–219 points: Satisfactory (3)
- 220–259 points: Good (4)
- 260–300 points: Excellent (5)

Mandatory reading list:
- Comprehensive and up-to-date literature covering the entire scope of the course is not available.
- The specialized books relevant to individual subtopics generally exceed the depth required for this course, and their availability may vary over time.

Recommended reading list:
- Instructor-prepared teaching materials distributed during classes
- Instructor-developed e-learning materials

Course description
Informing students on course requirements

From Sept 2025

Program: **PhD day- training for SH students and self-cost students**
Course: **Scientific communication and publication. Methods, rules, ethics**
Course code: **AOKDI-BAS-02**
Academic year/Semester: **2025/2026, 2nd.**
Educator and contact details (e-mail): **Prof. Dr. Ernő Duda DSc, duda@brc.hu**
Type of course: **lecture/**seminar/practice/laboratory Lectures Exam date:
Weekly hours of the course: **1** (14 hours)
Credit vale of the course: **3**
Type of examination**:** final exam at the end of semester, practice exam, other: final written exam at the end of semester (brief answer questions)
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): **none** (be a PhD student)
Purpose of course: To help students to navigate in the (natural) sciences of 21st century. Planning, execution, documentation of experiments. Reproducibility, significance of results. Ways and tools of scientific communication. Posters, oral presentations, publications, PhD theses, chapters, book, patents. Open science, open access, blockchain in science. Peer review, predatory journals, impact of publications.
Outcome requirements of the course (specific academic results to be established by the course): The students should know how to plan and evaluate experiments, how to tell if the results are reproducible, how to document their results, how to communicate their research, how to write a scientific paper, a PhD thesis, when to contact a legal expert to file patents. They should know where to look for information concerning legal requirements, financial regulations, how to participate in (international) collaborations, how to form consortia, where to find scientific courses, calls for scientific proposals, how and when to use AI.
Topics: **Data mining** Big data – structured and unstructured big data Extract data from websites, applications, spreadsheets, IT infrastructure, emails and more Interpret diverse file naming conversions Check data for completeness and accuracy Transform unstructured data automatically into easily digestible reports, tables, or files Move data and files securely to different locations and users with file transfer automation **AI** Artificial intelligence in medical diagnosis Artificial Intelligence in Medical Epidemiology AI in medical (pharmaceutical) research and discovery Informed, strategic decision making Natural Language Processing

Machine learning Deep structured or „hierarchical” learning **Meta analysis** Purpose of the research Working plan, hypothesis Sample collection, data base Analysis, validation Comparison with reference data Results, publication **Science in the 21st century** Civilisation, religion, empirical science Ancient science, medieval science, development of experimental sciences Industrial revolution, modern science, trends in the 20th and 21st century Forms and rules of scientific communication Scientific literature, databases, impact, citations **Scientific career** Phases of the scientific career Requirements of success in different phases World science, collaborations, networks Your proposals, your project, your own team Know your skills and talents! Different paths after PhD **Challenges in the 21st century** Irreproducible research: mistakes, fabrications, plagiarism Plagiarism-detecting software, corrections, retractions Digital age: OCRID, scientist with a number, contribution to a publication Open access: price, importance, advantages and complications, publication of negative results Open access journals, predator journals Electronic notebooks, patents or blockchain? Death of IF
Supporting methods to achieve learning outcomes: Convincing lectures
Evaluation of the acquisition of expected learning outcomes: Evaluation well be in accordance with the purposes and requirements of the course: written exam at the end of the lectures.
Mandatory reading list: none
Recommended reading list: none

Course description
Informing students on course requirements
From September 2025

Program: **Ph.D. day- training for SH students and self-cost students**
Course: **Biostatistics lecture** Course code: **AOKDI-BAS-03**
Academic year/Semester: *2025/26 1st semester*
Educator and contact details (e-mail): Tibor Nyári PhD (kurzusfelelős), nyari.tibor@med.u-szeged.hu Krisztina Boda PhD, boda.krisztina@med.u-szeged.hu

Tamás Lantos PhD, lantos.tamas@med.u-szeged.hu
Ferenc Rarosi PhD, rarosi.ferenc@med.u-szeged.hu
Szűcs Mónika szucs.monika@med.u-szeged.hu

Type of course: **lecture**/seminar/practice/laboratory

Weekly hours of the course: **2**

Credit value of the course: **6**

Type of examination**: final exam at the end of semester**

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course):

Purpose of the course:

The aim of this course is to familiarize students with the most commonly used statistical methods in the clinical and research fields of medicine, enabling them to apply these methods. Students will also learn to correctly interpret statistical results from statistical software or medical articles.

Throughout the course, students will learn the concepts of data and databases. They will be able to formulate hypotheses specific to a given experimental design, create the necessary database, determine the types of variables within the database, and describe their distribution.

Students will become familiar with the methods of hypothesis testing commonly used in medical research and with the fundamentals of statistical modeling. They will learn how to select appropriate statistical methods to test hypotheses, run statistical analyzes using statistical programs, and draw appropriate statistical and medical conclusions based on the results, interpreting them according to industry standards. In addition, they will learn when it is necessary to involve a statistician in the research process.

Topics:

14. **Introduction. Data description.**
    Types of data, display of data. Sample characteristics. Categorical and continuous variables, absolute and relative frequency, bar chart, pie chart, histogram; mean, median, mode, range, quartiles, variance, standard deviation, mean-error chart, box diagram). Population, sample.
15. **Basics of Probability Theory I.**
    The concept of probability, rules of probability calculus. Odds, odds ratio. Definition of a categorical variable, the distribution, expected value, and variance of a categorical variable. Special discrete distributions: the binomial and Poisson distributions.
16. **Basics of Probability Theory II.**
    Conditional probability, diagnostic tests. The distribution of continuous variables, the density function. The normal distribution. Standardization, the binomial test as an application of standardization.
17. **Statistical estimation.**
    The central limit theorem; the standard error of the mean. The concept of a confidence interval. Confidence interval for the odds ratio. Confidence interval for the population mean. The t-distribution, the use of Student's t-table. Hypothesis tests: one sample t-test, binomial test.
18. **Statistical inference, t-tests**
    One sample, paired, and independent samples t-test. Comparison of variances (F-test). One- and two-tailed tests.
19. **Correlation-regression analysis.**
    Single and multiple linear regression. Linear regression on transformed data.
20. **The chi-square test for independence**

Assumptions, Fisher exact test

21. **Statistical errors**
    Type I and II errors, statistical power. The basics of sample size calculation
22. **Analysis of variance**
    Principle of one-way ANOVA, F-test, pairwise comparisons. Repeated measurements ANOVA.
23. **Nonparametric methods based on ranks**
    Wilcoxon-test, Mann-Whitney test, Kruskal-Wallis test
24. **2x2 tables in epidemiology**
    Cohen-Kappa, relative risk, odds ratio, logistic regression.
25. **Survival analysis**
    Life-table, Kaplan-Meier method
26. **Multivariate methods**
    Factor analysis, cluster analysis, discriminant analysis. The aim and most important properties.

Supporting methods to achieve learning outcomes:
Teaching methods:
In addition to giving theoretical background, we give practical examples based on medical and biological research papers to show the application of the methods in practice.

Requirements:
The final grade is determined on the total score, where the total score is the sum of the points obtained in practice and the final exam.
The grades are awarded as follows on the total score:
0 - 101.99 points: Fail (1)
102 - 125.99 points: Pass (2)
126 – 151.99 points: Average (3)
152 – 175.99 points: Good (4)
176 - : Excellent (5)

Exam Test
Exams are held in the classrooms of the Small Educational Building in the form of a CooSpace test. The tests cover the entire semester's practical and theoretical material, with a special focus on the use of statistical software. auxiliary materials are not allowed during the exam.
To register for the exam, students must register through the Neptun system, and registration will automatically close 24 hours before the exam begins.
The duration of the exam test is 40 minutes, and a maximum of 100 points can be earned.

Mandatory reading list:
Students can download course material (handouts, lecture notes) from Coospace. Making notes at lectures will help in preparing for the exam.

Recommended reading list:
- Michael J. Campbell – David Machin – Stephen J. Walters: Medical Statistics. A Textbook for the Health Sciences (2012) ISBN: 978-1-118-30061-9
- Internet resources:
  Khan Academy: https://www.khanacademy.org/math/statistics-probability
  Crash Course (Statistics): https://www.youtube.com/playlist?list=PL8dPuuaLjXtNM_Y-bUAhblSAdWRnmBUcr
  Rice Virtual Lab in Statistics: http://onlinestatbook.com/rvls.html
- Reiczigel Jenő – Harnos Andrea – Solymosi Norbert: Biostatisztika nem statisztikusoknak (2014). Pars Kft. ISBN: 978-963-06-3736-7 (In Hungarian)
- E-learning (in Hungarian): http://eta.bibl.u-szeged.hu/view/creators/Sz==0171cs=3AM=F3nika=3A=3A.html

Course description
Informing students on course requirements
From September 2025

Program: **PhD day- training for SH students and self-cost students**

Course**: Biostatistic practice**

Course code: **AOKDI-BAS-04**

Academic year/Semester: **2025/26 1st semester**

Educator and contact details (e-mail):
Szűcs Mónika szucs.monika@med.u-szeged.hu

Type of course: **practice**

Weekly hours of the course: **2**

Credit vale of the course: **2**

Type of examination: **three-level acceptance**

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): not

Purpose of course:

The aim of this course is to familiarize students with the most commonly used statistical methods in the clinical and research fields of medicine, enabling them to apply these methods. Students will also learn to correctly interpret statistical results from statistical software or medical articles.
Throughout the course, students will learn the concepts of data and databases. They will be able to formulate hypotheses specific to a given experimental design, create the necessary database, determine the types of variables within the database, and describe their distribution.
Students will become familiar with the methods of hypothesis testing commonly used in medical research and with the fundamentals of statistical modeling. They will learn how to select appropriate statistical methods to test hypotheses, run statistical analyzes using statistical programs, and draw appropriate statistical and medical conclusions based on the results, interpreting them according to industry standards. In addition, they will learn when it is necessary to involve a statistician in the research process.

Outcome requirements of the course (specific academic results to be established by the course):

Topics:

14. **Introduction. Data description.**
    Types of data, display of data. Sample characteristics. Categorical and continuous variables, absolute and relative frequency, bar chart, pie chart, histogram; mean, median, mode, range, quartiles, variance, standard deviation, mean-error chart, box diagram). Population, sample.
15. **Basics of Probability Theory I.**
    The concept of probability, rules of probability calculus. Odds, odds ratio. Definition of a categorical variable, the distribution, expected value, and variance of a categorical variable. Special discrete distributions: the binomial and Poisson distributions.

16. **Basics of Probability Theory II.**
    Conditional probability, diagnostic tests. The distribution of continuous variables, the density function. The normal distribution. Standardization, the binomial test as an application of standardization.
17. **Statistical estimation.**
    The central limit theorem; the standard error of the mean. The concept of a confidence interval. Confidence interval for the odds ratio. Confidence interval for the population mean. The t-distribution, the use of Student's t-table. Hypothesis tests: one sample t-test, binomial test.
18. **Statistical inference, t-tests**
    One sample, paired, and independent samples t-test. Comparison of variances (F-test). One- and two-tailed tests.
19. **Correlation-regression analysis.**
    Single and multiple linear regression. Linear regression on transformed data.
20. **The chi-square test for independence**
    Assumptions, Fisher exact test
21. **Statistical errors**
    Type I and II errors, statistical power. The basics of sample size calculation
22. **Analysis of variance**
    Principle of one-way ANOVA, F-test, pairwise comparisons. Repeated measurements ANOVA.
23. **Nonparametric methods based on ranks**
    Wilcoxon-test, Mann-Whitney test, Kruskal-Wallis test
24. **2x2 tables in epidemiology**
    Cohen-Kappa, relative risk, odds ratio, logistic regression.
25. **Survival analysis**
    Life-table, Kaplan-Meier method
26. **Multivariate methods**
    Factor analysis, cluster analysis, discriminant analysis. The aim and most important properties.

Supporting methods to achieve learning outcomes:

Teaching methods

We give practical examples based on medical and biological research papers to show the application of the methods in practice.
During the practices, the R, Rcommander programs are used.

Evaluation of the acquisition of expected learning outcomes:

Requirements:

Attendance of the practical part is obligatory. Participating in practical sessions according to the 'Study Guide of the Faculty of Medicine'. Maximum 3 absences are allowed and at least 51% completion of the course (see below). Students who arrive more than 15 minutes late will be considered absent.

Forms of testing

The students have to perform two tests that contain practical problems that have to be solved by hand calculations and by a computer program (R, Rcommander). During the tests, the use of calculators, computers (without Internet) and their own notes on a single A4 sheet is allowed.

Evaluation of the course:

The course result is evaluated by a three-grade sign. It will be calculated from the test points (maximum 100 points). For successful completion of the course, the total accomplishment must be at least 51%.
The evaluation of the practical is based on the sum of two tests.

Accomplishement, practice, %	Evaluation
0% -50,99%	Not met requirements /Failed(NOMETRE)
51%-90,99%	Met requirements /Satisfactory (METRE/P)t
91%-	Met requirements /Excellent(METRE/H)

Mandatory reading list:

Students can download course material (handouts, lecture notes, R scripts) from Coospace. Making notes at lectures will help in preparing for the exam.

Recommended reading list:

- Michael J. Campbell – David Machin – Stephen J. Walters: Medical Statistics. A Textbook for the Health Sciences (2012) ISBN: 978-1-118-30061-9
- Internet resources:
  Khan Academy: https://www.khanacademy.org/math/statistics-probability
  Crash Course (Statistics): https://www.youtube.com/playlist?list=PL8dPuuaLjXtNM_Y-bUAhblSAdWRnmBUcr
  Rice Virtual Lab in Statistics: http://onlinestatbook.com/rvls.html
- Reiczigel Jenő – Harnos Andrea – Solymosi Norbert: Biostatisztika nem statisztikusoknak (2014). Pars Kft. ISBN: 978-963-06-3736-7 (In Hungarian)
- E-learning (in Hungarian): http://eta.bibl.u-szeged.hu/view/creators/Sz==0171cs=3AM=F3nika=3A=3A.html

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Course description

Informing students on course requirements

From September 2025

Program: **PhD day- training for SH students and self-cost students**

Course: **Biomedical ethics**

Academic year/Semester: 2th

Educator and contact details (e-mail):

Gergely Tari Ph.D. – assistant professor
Department of Behavioral Sciences (6720 Szeged Szenháromság st. 5.)
e-mail: tari.gergely.robert@med.u-szeged.hu

Oguz Kelemen Ph.D. – associate professor
Department of Behavioral Sciences (6720 Szeged Szenháromság st. 5.)
e-mail: kelemen.oguz@med.u-szeged.hu

Hedvig Kiss Ph.D. – assistant professor
Department of Behavioral Sciences (6720 Szeged Szenháromság st. 5.)
e-mail: kiss.hedvig@med.u-szeged.hu

Type of course: lecture/seminar/practice/laboratory

Weekly hours of the course: 2 (for 7 weeks)

Credit vale of the course: 3

Type of examination: final exam at the end of semester, practice exam, other: evaluation (5)

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): nonne

Purpose of course:
Primary aim of the biomedical ethics course is to describe the ethical and legal regulations concerning the biomedical field. In addition, we would like to sensitize our students attitudes towards ethical dilemmas appearing in the fields of natural sciences and developing their debate culture. By learning the theory and practice of the bioethical principles we highlight the inseparably connected international rights like human dignity and self-determination. The course support to train ethically well-prepared professionals, who are able to recognize, precisely outline and in regard to their competence solve bioethical dilemmas.

Outcome requirements of the course (specific academic results to be established by the course):

Knowledge

- Know in depth the bioethical principles (Non-maleficence; Beneficence; Justice; Autonomy).
- Comprehensively knows the Hungarian and international ethical norms in relation to biomedical research involving human subjects.
- In general, knows the Hungarian and international ethical norms in relation to animal experimentation.
- Comprehensively aware of the patient rights included in the Act No. CLIV of 1997 on Health and 23/2002. (V.). regulation.

Competences

- Recognize the bioethical dilemmas concerning his profession.
- According to the principles of moral reasoning student can formulate criticism in connection with biomedicine individually.
- Student applies the ethical standards of biomedical research while planning his research.
- Applies the professional ethical norms in order to reduce harm of animals used in experimentation.
- According to his competence Student can interact with patients and human subjects involved in biomedical research. (e.g. in process of information).

Atttitudes

- Assertive while discussing the ethical dilemma.
- Endeavor to precisely and factually describe ethical dilemmas refraining from make mistakes concerning moral reasoning. (e.g.: ad hominem reasoning).
- Always respects the default value of human dignity.
- Accepts the principles of 3Rs (Replacement, Reduction, Refinement).
- Respect of human life is the foremost guiding principle.

Autonomy and responsibility

- Able to solve professional ethical dilemmas under supervision.
- Student must refer all the professional ethical problems that are beyond his competence towards his supervisor.
- In the research planning process autonomously apply the ethical norms of biomedical research.
- If eligible to participate in any stage of animal experimentation, Student meets the professional ethical expectations.
- While working alone or in team always complies with the rights and laws concerning biomedical research.

Topics:

1. Introduction to bioethics
2. Ethical aspects of biomedical research involving human participants

a. International ethical norms
i. Nuremberg Code
ii. Oviedo convention on human rights and biomedicine
iii. Helsinki Declaration
b. Ethical standards and laws regulating biomedical research involving human participants
i. Ethical Code (MOK)
ii. Act No. CLIV of 1997 on Health
iii. 23/2002. (V.9.) regulation
3. Ethical aspects of animal experimentation
a. International ethical guidelines
i. 3Rs (Replacement, Reduction, Refinement)
b. Animal rights movements
i. Concepts of Tom Regan and Peter Singer
4. Reproductive ethics in regard of embryonic research
a. In vivo and In vitro research ethics
b. Ethical issues of „designer babies”
5. Main aspects of ethics of genetics
a. CRISPR-Cas9
b. Evaluation of He Jiankui’s gene surgery
6. Workshop I. – COVID-19 vaccination
7. Workshop II. – Ethical evaluation of AI

Supporting methods to achieve learning outcomes:

Teaching methods:
- Workshops
- Practicing moral arguments
- Case analysis

Evaluation of the acquisition of expected learning outcomes:
Requirements:
- Attandence regulated according to the study and examination rules
- Grade is given according to attendance and student activity (Completing MS Forms sheets are compulsory!)
- Written test for those students who have abscences

Mandatory reading list:

- Dr. Kovács József: A modern orvosi etika alapjai. Medicina, Budapest, 2006.
- Gupta R, Morain SR: Ethical allocation of future COVID-19 vaccines. Journal of Medical Ethics Published Online First: 17 December 2020. doi: 10.1136/medethics-2020-106850
- Gruen, Lori, "The Moral Status of Animals", *The Stanford Encyclopedia of Philosophy* (Fall 2017 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/fall2017/entries/moral-animal/>.
- Krimsky, S. Ten ways in which He Jiankui violated ethics. Nat Biotechnol 37, 19–20 (2019). https://doi.org/10.1038/nbt.4337

Recommended reading list:

Sinaci, M., Sorgner, S.F. (szerk.): Ethics of Emerging Biotechnologies. From Educating the Young to Engineering Posthumans. Trivent Publishing, Budapest, 2018.

16. Descriptions of PhD courses in English for students of the Doctoral Schools of Clinical Medicine (09. 2025)

Course description template
Informing students on course requirements
(In accordance with information and study materials available on CooSpace)

From February 2025

Program: PhD
Course: **Family planning**
Academic year/Semester: **2024-2025/2nd semester**
Educator and contact details (e-mail): **Dr. habil. Tamás Bitó, bito.tamas@med.u-szeged.hu**
Type of course: **lecture**/seminar/practice/laboratory
Weekly hours of the course: **2**
Credit vale of the course: **6**
Type of examination: **final exam at the end of semester**, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): **Prior medical or pharmaceutical studies**
Purpose of course: **To provide an overview on different aspects of human reproduction, family planning and birth control.**
Outcome requirements of the course (specific academic results to be established by the course): **Ability to write a project proposal for ethical approval** **Successfull verbal final exam**
Topics: **Reproductive rights, female cycle, conception, physiological and pathological changes in pregnancy, infertility, assisted reproduction, fertility regulation, spontaneous and induced abortion.**
Supporting methods to achieve learning outcomes: Teaching methods: **Besides giving theoretical background, we give practical examples based on medical research papers to show the application of the methods in practice. During some lectures, students actually present will get homework on the lectures to get bonus points on the final.** Homework: **To prepare a questionnare based study on the socio-economic background and lifestyle factors of spontaneous abortion.**
Evaluation of the acquisition of expected learning outcomes: Requirements: **Usable practical knowledge on different aspects of human reproduction. Ability to write a project proposal for ethical approval** Examination requirements: **Successful verbal final exam**
Mandatory reading list: **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400** **https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception** **https://www.paho.org/en/topics/sexual-and-reproductive-health**
Recommended reading list: **Medical eligibility criteria for contraceptive use, Fifth edition, 2015** **https://iris.who.int/bitstream/handle/10665/181468/9789241549158_eng.pdf?sequence=9** **WHO, ACOG and RCOG guidelines related to the topics**

Indicating course requirements on CooSpace scene (summary)

Description (public): **The aim of the course is to provide an overview on different aspects of human reproduction, family planning and birth control.**
Requirements: **Prior medical or pharmaceutical studies**
Topics: **Female cycle, conception, physiological and pathological changes in pregnancy, infertility, assisted reproduction, fertility regulation, spontaneous and induced abortion, reproductive rights** - supporting methods to achieve learning outcomes **Theoretical lectures and practical examples for project proposal writing in the field of human reproduction.** - mandatory reading list **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400** **https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception** **https://www.paho.org/en/topics/sexual-and-reproductive-health** - recommended reading list **Medical eligibility criteria for contraceptive use, Fifth edition, 2015,** **WHO, ACOG and RCOG guidelines related to the topics**

Course description template
Informing students on course requirements
(In accordance with information and study materials available on CooSpace)

From February 2025

Program: **PhD**
Course: **Complications in pregnancy**
Academic year/Semester: **2024-2025/2nd semester**
Educator and contact details (e-mail): **Dr. habil. Tamás Bitó** **bito.tamas@med.u-szeged.hu**
Type of course**: lecture**/seminar/practice/laboratory
Weekly hours of the course: **2**
Credit vale of the course: **6**
Type of examination: **final exam at the end of semester**, practice exam, other:……..
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): **Prior medical or pharmaceutical studies**
Purpose of course: **To provide an overview on different possible complications during pregnancy, its consequences and management.**
Outcome requirements of the course (specific academic results to be established by the course): **Ability to write a project proposal for ethical approval** **Successfull verbal final exam**
Topics: **The effect of pregnancy on various diseases, the effect of diseases on the course and outcome of pregnancy, antenatal care and delivery in case of pregnant women with different diseases.**
Supporting methods to achieve learning outcomes:

Teaching methods: **Besides giving theoretical background, we give practical examples based on medical research papers to show the application of the methods in practice. During some lectures, students actually present will get homework on the lectures to get bonus points on the final.** Homework: **To prepare a project proposal of a prospective observational study on the pregnancy outcome in case of a given disease.**
Evaluation of the acquisition of expected learning outcomes: Requirements: **Usable practical knowledge on pregnancies with different diseases. Ability to write a project proposal for ethical approval** Examination requirements: **Successfull verbal final exam**
Mandatory reading list: **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400**
Recommended reading list: **WHO, ACOG and RCOG guidelines related to the topics**

Indicating course requirements on CooSpace scene (summary)

Description (public): **The aim of the course is to provide an overview on different possible complications during pregnancy, its consequences and management.**.
Requirements:**Prior medical or pharmaceutical studies**
Topics: **The effect of pregnancy on various diseases, the effect of diseases on the course and outcome of pregnancy, antenatal care and delivery in case of pregnant women with different diseases.** - supporting methods to achieve learning outcomes **Theoretical lectures and practical examples for project proposal writing in case of complicated pregnancy by different diseases.** - mandatory reading list **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400** - recommended reading list: **WHO, ACOG and RCOG guidelines related to the topics**

Course description template
Informing students on course requirements
(In accordance with information and study materials available on CooSpace)

From September 2025

Program: **PhD**
Course: **Obstetric and gynecological aspects of metabolic diseases**.
Academic year/Semester: **2025-2026/1st semester**
Educator and contact details (e-mail): **Dr. habil. Tamás Bitó** **bito.tamas@med.u-szeged.hu**
Type of course: **lecture**/seminar/practice/laboratory
Weekly hours of the course: **2**
6Credit vale of the course: **6**
Type of examination: **final exam at the end of semester**, practice exam, other:……..

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): **Prior medical or pharmaceutical studies**
Purpose of course: **To provide an overview on obstetric and gynecological aspects of different metabolic alterations.**
Outcome requirements of the course (specific academic results to be established by the course): **Ability to write a project proposal for ethical approval** **Successfull final exam**
Topics: **Obstetric complications related to obesity, insulin resitance, diabetes mellitus. Screening and management of GDM. Gynecological diseases (incl. PCOS, infertility, endometrial hyperplasia/carcinoma) associated with metabolic alterations. Contracetption in case of metabolic alterations.**
Supporting methods to achieve learning outcomes: Teaching methods: **Besides giving theoretical background, we give practical examples based on medical research papers to show the application of the methods in practice. During some lectures, students actually present will get homework on the lectures to get bonus points on the final.** Homework: **To prepare a project proposal of a prospective observational study on the pregnancy outcome in case of a given metabolic alteration.**
Evaluation of the acquisition of expected learning outcomes: Requirements: **Usable practical knowledge on obstetric and gynecological aspects of different metabolic alterations. Ability to write a project proposal for ethical approval** Examination requirements: **Successfull verbal final exam**
Mandatory reading list: **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400**
Recommended reading list: **Medical eligibility criteria for contraceptive use, Fifth edition, 2015** **https://iris.who.int/bitstream/handle/10665/181468/9789241549158_eng.pdf?sequence=9** **WHO, ACOG and RCOG guidelines related to the topics**

Indicating course requirements on CooSpace scene (summary)

Description (public): **The aim of the course is to provide an overview on obstetric and gynecological aspects of different metabolic alterations.**
Requirements: **Prior medical or pharmaceutical studies**
Topics: **Obstetric complications related to obesity, insulin resitance, diabetes mellitus. Screening and management of GDM. Gynecological diseases (incl. PCOS, infertility, endometrial hyperplasia/carcinoma) associated with metabolic alterations. Contracetption in case of metabolic alterations.** - supporting methods to achieve learning outcomes **Theoretical lectures and practical recommendations for project proposal writing.** - mandatory reading list **Hacker & Moore's: Essentials of Obstetrics and Gynecology 5th Edition, ISBN-13:978-1416059400** - recommended reading list **Medical eligibility criteria for contraceptive use, Fifth edition, 2015** **WHO, ACOG and RCOG guidelines related to the topics**