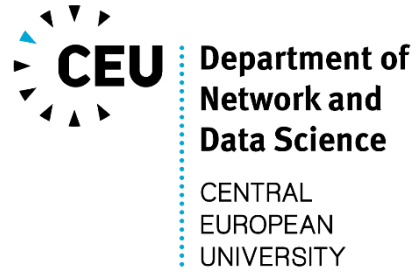
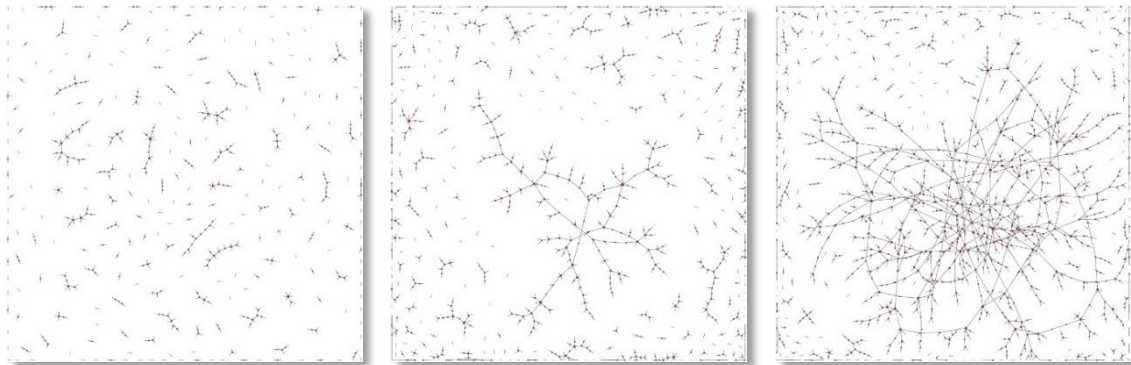


CENTRAL EUROPEAN UNIVERSITY
Department of Network and Data Science



PHD STUDENT HANDBOOK

Academic Year 2018-19



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This information package contains all essential information about the PhD studies at CEU Department of Network and Data Science. Please read it thoroughly and carefully and consult it first in case you have any questions.

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1. BASIC PROGRAM DATA

Institution Responsible	Central European University
Name of Unit	Department of Network and Data Science
Degree to be Awarded	Doctor of Philosophy in Network Science A three year program that is registered with the Board of Regents of the University of the State of New York (US).
Starting Date	September 17, 2018
Address	Nádor u. 11., H-1051 Budapest Tel: +36 (1) 327-3000
Mailing Address	1051 Budapest, Nádor u. 9., Hungary
Department Head	János Kertész (kerteszy@ceu.edu)
PhD Program Director	János Kertész (kerteszy@ceu.edu)
Program Coordinator	Olga Peredi (peredio@ceu.edu)

MAJOR DEADLINES FOR THE FIRST YEAR:**February 1, 2019: Choice of a supervisor and submission of first draft of Research Proposal****May 17, 2019: Submission of the Detailed Research Proposal****June 6-7, 2019: Comprehensive Exam and Defense of the Detailed Research Proposal**

2. GENERAL OUTLINE OF THE PROGRAM

PURPOSES, GOALS AND OBJECTIVES

The purpose of the program is to offer doctoral-level education matching the highest international standards in the fields of Network Science for prospective academics and experts for the industry.

The Department of Network and Data Science offers a doctoral program accredited by the Board of Regents of the University of the State of New York (US) for and on behalf of the New York State Department of Education. Funding is for three years and the Dissertation must be defended within five years of defending the Detailed Research Proposal (see later).

The Department encourages empirical research using a wide variety of methodologies as well as it expects theoretical approaches which embrace a broad intellectual agenda. We especially welcome projects that promote the integration of network science perspectives as well as methodologies, including data mining, data analytics and modeling.

We envision the PhD program in Network Science at CEU to train researchers with the highest standards of academic excellence in network science – with theoretical, mathematical and computational skills as well as hands-on experience with large datasets and participation in international research projects. We expect mostly research in applications of network science to tasks in a diversity of fields including social sciences, economics, finance, environmental science and political science but fundamental contributions to the theory of complex networks are also welcome. We designed a program that is at the forefront of network research, and at the same time engages the existing resources, research directions, and interdisciplinary interests at CEU.

Beyond building on resources at CEU, we also plan to closely collaborate with international and local universities and research Departments. Hungary happens to be one of the intellectual hotspots of network science, an undisputed epicenter of graph theory in mathematics, home to key researchers of social, physical, and biological networks, and home to several businesses with international reach that apply network science in organizational development, marketing, and social media.

PROGRAM OUTLINE

PROBATIONARY PERIOD

In their first year, between the date of enrolment and the successful defense of the Detailed Research Proposal, students have the status of “Probationary PhD Candidates”. Probationary PhD Candidates have to reside in Budapest for the duration of the academic year, participate in the life of the department and earn the required number of credits.

FIRST YEAR COURSEWORK

By the end of the first academic year, probationary PhD candidates have to complete 24 course credits by attending courses offered by the Network Science PhD Program and such courses which are cross-listed with the Network Science PhD Program.

RESEARCH WORKSHOP AND COLLOQUIUM/SEMINAR SERIES

Probationary PhD candidates are expected to attend regularly the Research Workshop, where faculty and students present and discuss their work in progress. Students are also expected to participate in the Colloquium/Seminar Series – a series of invited lectures by network scientists visiting the Department. The Workshop and the Seminar Series are for a Pass/Fail qualification in

the first year. Attendance is taken at each meeting, and presence is required for all Workshop meetings, and at least 70% of the Colloquium meetings.

FIRST YEAR WORK WITH A RESEARCH ADVISOR

Every probationary PhD candidate is assigned a research advisor (or “early supervisor”) by the Doctoral Committee of the Network Science PhD Program. Students have to meet their research advisors regularly (typically once a week) according to a prearranged schedule. The task of the research advisor is to help the student to identify their research topic, to draw up a structured plan for data collection and research methodology to be used, and to organize and start the empirical research leading to the preparation of the thesis. The advisor should also be regularly consulted during the preparation of the Detailed Research Proposal.

COMPREHENSIVE EXAM

During the Spring Term of the first academic year students should take the Comprehensive Exam. The Comprehensive Exam comprises the topics of the mandatory courses. The list of possible questions should be made public by the end of the Winter Term at the latest.

An Exam Committee of at least three faculty members of CEU is formed by the Doctoral Committee, which may include the Supervisor. The members of the Exam Committee coordinate with the candidate about the details of the exam (textbooks, course material, etc.). This is an oral exam, which should be organized by the Program Coordinator. If the Comprehensive Exam is failed, it can be repeated one time after a learning period of at least four weeks.

DETAILED RESEARCH PROPOSAL

In the first year 6 credits are given for the preparation of the Detailed Research Proposal. The Network Science PhD Program is markedly research oriented, where the PhD Thesis is expected in most cases to be based on the results of data collection, analysis and modeling. Therefore, by the end of their first year, probationary PhD candidates are required to write a Detailed Research Proposal of 10-15 A4 pages, with 12p Times New Roman letters, single spacing, 6p paragraph separation, 28 mm side margins and 45 mm top and bottom spacing, including formulas, figures but excluding references. The Research Proposal should specify the central question(s) to be investigated in the Thesis Research and the aim of the research; it should provide a brief review of previous relevant work and methodologies used to investigate the research topic, it should include a theoretical rationale for the line of research proposed, it should specify the data to be analyzed and the novelty of the planned work. The Detailed Research Proposal has to represent a realistic and specific plan of the thesis research that should be tailored to be realizable within the framework of the two subsequent years of PhD studies. For the checklist of the Detailed Research Proposal and the format of the front page see Annex II and Annex III.

DEFENSE AND EVALUATION OF THE DETAILED RESEARCH PROPOSAL

The Research Proposal is developed during the whole first academic year, but the proposal writing workshop is especially focused on finalizing the proposal. The proposal has to be formally presented to a Thesis Committee that includes the student’s Research Advisor and two other members of the Faculty of the Network Science PhD Program. The Thesis Committee will discuss the presentation, will raise questions and criticisms, and the student will have to answer the questions and defend her Thesis Proposal. At the end of this process, the Thesis Committee will evaluate the feasibility of the Research Proposal. It may provide recommendations and request changes, to ensure that the planned research is realizable within the next two years of PhD

research period, and will serve as the empirical basis for the student's PhD Dissertation Thesis. The Thesis Committee chooses one of the following evaluation possibilities:

- *Unconditional pass*
- *Conditional pass*. The candidate has to modify the Detailed Research Proposal according to the requests of the Committee. A deadline of maximum 2 months is given and the revised proposal is evaluated by the committee members.
- *Substantial changes needed*. The candidate has to revise the Detailed Research Proposal and a new defense is to be organized. The deadline for the revision is maximum 2 months.
- *Fail*. The Detailed Research Proposal is rejected.

The Grade Point Average (GPA) is calculated from the grades received for the coursework and the First Year Research Proposal. Students whose GPA is 3.00 (i.e. B) or higher, who passed the Comprehensive exam and whose First Year Research Proposal has been approved by the Thesis Committee will get the status of "Doctoral Candidate" and can start their second year of their PhD research program. Students with less than 3.00 GPA, failed the Comprehensive Exam or whose First Year Research Proposal has not been approved by the Thesis Committee cannot start their second year, and their student status will be terminated.

CANDIDACY PERIOD

Doctoral Candidates shall reside in Budapest during their candidacy period, and attend the University on a regular basis. Doctoral Candidates shall participate in the academic life of the department and attend seminars, programs and lectures. With the prior approval of the Doctoral Committee, a Doctoral Candidate may spend specified periods during the Doctoral Candidacy period out of residence in Budapest.

The residency requirement concerns all Doctoral Students, according to the university doctoral regulations. Therefore those students who no longer receive a stipend should also apply to the Doctoral Committee for permission to spend time away from Budapest. The permission can be given for maximum one year at a time. It is the responsibility of the Candidate to make sure that s/he provides adequate contact information during her/his absence.

PERMANENT RESEARCH SUPERVISOR AND ASSOCIATE SUPERVISOR

Every Doctoral Candidate has to have a permanent Research Supervisor. The Doctoral Committee assigns research supervisors to Candidates, based on their research topic and faculty availability, and with prior consultation with the Candidate. The assignment of the Research Supervisor is approved by the University Doctoral Committee.

The permanent Supervisor supervises the work of the Candidate according to the directions specified in the university doctoral regulations, and prepares a report about the Candidate's progress at the end of each academic year. In special cases the Doctoral Committee may appoint an associate supervisor where the interdisciplinary nature of the Candidate's research topic requires supervision from two different fields of expertise. The duties of the associate supervisor are the same as those of a regular supervisor, according to the university regulations. The associate supervisor position counts as a regular supervision when calculating the maximum number of Doctoral Students a faculty member may supervise.

Candidates can approach faculty members with a request to serve as their associate supervisor. The associate supervisor can be occasionally consulted on specific questions related to the Candidate's thesis work, but cannot be expected to offer full guidance in the way the supervisor is.

Candidates may request in writing a change of their supervisors or associate supervisors (substantiating such a request). The Doctoral Committee is required to address the request within 15 days, and forward their decision on any change in the supervisor's status to the University Doctoral Committee for approval. Under special circumstances, if the completion of the Dissertation does not seem to be ensured, the Doctoral Committee can also initiate a change of the supervisor to the University Doctoral Committee.

REGULAR RESEARCH PROGRESS REPORTS

Every Winter or Spring Term the doctoral candidates have to present their research progress in the form of a 30-minute seminar talk and a written summary. After the presentation, a panel consisting of the supervisor, the second reader or associate supervisor (and, if necessary, a further member of the Department) discusses the progress, the problems and the plans with the candidate. The panel submits a detailed report of ca. one page about the progress to the Doctoral Committee.

Every Fall Term the supervisor (together with the second reader or the associate supervisor) submits a short report (of ca. half a page) about the progress of the students based on personal discussions to the Doctoral Committee.

SECOND AND THIRD YEAR COURSEWORK

In the second and third year, attendance at the Network Science Colloquium is required throughout the academic year. This is a Pass/Fail course and is worth 2 credits/academic year. Attendance is taken at each meeting, and presence is required for at least 70% of the meetings. In the second year, 26 credits are given to Dissertation research, and 4 credits for participating in reading courses. Reading courses are personalized courses with a faculty member, which are tailored to the specific needs of one or more PhD candidates. Reading courses should help the candidates to write the theoretical parts of their Dissertations. 28 credits are allocated for continuing research and Dissertation writing in the third year.

TEACHING EXPERIENCE

Doctoral Candidates are requested to gain teaching experience, preferably in the 3-rd year, of at least 2 credit teaching as assistants to a course given by a DNDS faculty.

Over the course of three years the program requires a total of 56 credits. *In addition, when resident in Budapest, all doctoral students are requested to regularly participate in the Seminar Series ("Colloquium/Research workshop").* The student who successfully completes the program (collects the requested credits and "passes", writes and defends the Dissertation) will be awarded a *Doctorate in Network Science*. The degree is accredited by the New York State Board of Regents of the State of New York (US).

3. ORGANIZATION OF STUDIES AND PHD REQUIREMENTS

ADMINISTRATION OF THE PHD PROGRAM IN NETWORK SCIENCE

The PhD Director heads the PhD Program in Network Science. Issues of policy, review and procedure, as well as problems and questions, are referred to the Doctoral Studies Committee, which is composed of the PhD Director and the Department Head.

MATHEMATICS ENTRY TEST

Students should complete a test in mathematics early September consisting of questions in the following areas in mathematics:

BASIC TOPICS IN MATHEMATICS

LINEAR ALGEBRA

Vector space, operations (scalar product, vector product), distance in multidimensional space, matrices as linear transformations, inverse of matrix, transpose, determinants, eigenvalues, eigenvectors, power of a matrix, solution of linear set of equations.

CALCULUS

Series, limit, continuity of functions. Derivative, rules, chain rule, inverse function. Higher order derivatives, analysis of functions (convexity, concavity, minimum, maximum, inflection). Multivariate functions, partial derivatives. Integration as limit, definite integrals, primitive function, relation to derivation, rules, integration by parts. Simple differential equations.

STATISTICS AND PROBABILITY

Basic statistics and probability theory, independence, conditional probability, expected value, standard deviation, correlation indicators (Pearson, Spearman), distributions. Multivariate distributions. Statistical tests, p-value, regression, modelling data distributions.

The threshold is at 50% in such a way that at least 40% should be reached in each of the three subjects. Those who fail the test have to take the "Quantitative methods" course for grade in the Fall Term.

Credits for PhD students of all years are to be accumulated as follows:

First year:	28 credits
Mandatory courses	16 credits
Elective and track courses:	6 credits
Proposal development:	6 credits
Second Year:	32 credits
Research:	26 credits
Reading courses:	4 credits
Colloquium:	2 credits
Third Year:	30 credits
Dissertation writing:	28 credits
Colloquium:	2 credits
Total	90 credits

PHD PROGRAM CURRICULUM

FIRST YEAR

*FALL TERM**Mandatory for students who failed the [Mathematics Entry Test](#):*

Quantitative Methodology (for Grade)	0 credit
<i>Mandatory courses:</i>	
Fundamental Ideas in Network Science	4 credits
Social Networks	4 credits
Research Workshop	no credits
Total:	8 credits

Elective courses:

Scientific Python (first half of term)	3 credits
Data and Network Visualization (second half of term)	2 credits
Graph Theory (Math)	3 credits
Other courses can be selected with agreement of the Doctoral Committee	
Total:	4 credits min

Minimum Fall Term credits: 12*WINTER TERM**Mandatory courses:*

Structure and Dynamics of Complex Networks	2 credits
Data Mining and Big Data Analytics	2 credits
Statistical Methods in Network Science and Data Analysis	4 credits
Research Workshop	no credits
Total:	8 credits

Elective courses:

Networks and Computers 3 credits

Agent Based Models 2 credits

Other courses can be selected with agreement of the Supervisor

Total: **2 credits min**

Minimum Winter Term credits: 10

SPRING TERM

Research Proposal Development 6 credits

Minimum Spring Term credits: 6

ATTENDANCE

All doctoral students are expected to be present and work at the Department on a regular basis. All absences should be documented in the shared DNDS calendar and communicated to the Faculty and the Coordinator.

USING THE SHARED DNDS CALENDARS

All doctoral students are expected to consult and use the two shared calendars for up-to-date information on classes, research workshops/colloquia and other events organized by the Department.

DNDS SCHEDULE CALENDAR

All doctoral students can view this calendar, which lists all the classes, research workshops/colloquia, conferences and other academic events of the Department. All students are expected to participate in the research workshops/colloquia on Mondays from 1:30pm-2:30pm and to attend the occasional talks given by invited speakers at other times.

DNDS AT CEU CALENDAR

All students can view, add and modify events in this calendar, which lists absences, conference/workshop participations elsewhere, meetings, etc. This also lists the important dates and deadlines of the academic year, including deadlines for various grant applications.

STUDY PLANS

The present university policy for PhD studies provides 36 months of CEU fellowship. The first year of study in which the student prepares for the Detailed Research Proposal in which the student writes the Dissertation are both residential years at CEU in Budapest. The research period can take several forms.

The CEU Department of Network and Data Science urges students to develop their plan, which may include study abroad (possibly with CEU stipend); however, during the probationary period the students have to stay at CEU. Given the variety of study plans adopted by students, all students are responsible for informing and responding to requests for information about their plan for fulfilling the final year requirements. **In all cases, the student must fulfill the requirements of the final year in residence for at least two terms in Budapest and must save sufficient CEU stipend to cover that period of residence.**

FUNDING RULES FOR PHD STUDIES

The maximum period of CEU stipend (excluding Study Abroad) for doctoral studies is **36 months**. Doctoral students are required to submit their PhD Dissertation within **five calendar years** of passing the Comprehensive Exam. During this time, the remaining stipend can be used in chunks as suggested above in the study plans or spread over the five years. Students at the final stage of writing can apply for a write-up grant for up to 6 months. The final draft of the Dissertation is to be submitted no more than a month after the closing date of the **grant**. The write-up grant for doctoral students is designed to help PhD students to complete their thesis when they exhausted their normal 36 months of scholarship. The grants are not automatic, and they are given on the basis of need and merit.

The duration of the grant is maximum six months. For the period of the grant, the student gets paid the usual PhD stipend. The period of the write-up grant is not an extension of the usual 6

years of the doctoral studies; the grant has to be completed within the six years. (Only if a student was granted an extension by the University Doctoral Committee independently, can s/he use a write-up grant for the extended period.)

Request for a write-up grant must come from the primary supervisor of the student. (Students cannot apply for the grant directly.) For more information, see the guideline for write-up grants.

“STOPPING THE CLOCK”

After passing the Comprehensive Examination, doctoral students may “stop the clock” of their fellowship period if they wish to stop receiving their stipend from CEU. **This status can be requested for up to 12 months but cannot be shorter than three months. Please note that “stopping the clock” means only *stopping the stipend*: you will be enrolled during that period, you need to pay the enrolment fee and you also have to register for courses.** Each student who wishes to “stop the clock” must fill out the change of status form, obtained from the Coordinator. There is no stopping the clock during the first year.

LEAVE OF ABSENCE

Leave may be taken for personal reasons or to pursue non-CEU funded study or research. If the leave is longer than six months, fellowship students must return to Budapest at the end of the first six months to consult with their PhD Supervisor.

Requests for leave, must be signed by the student's PhD Supervisor, and must be submitted in writing to the Doctoral Program Committee for approval. In case of approval, the change of status form should be sent to the Student Records Office by the department coordinator.

The [Student Rights, Rules and Academic Regulations](#) on leave of absence: In case of personal circumstances (illness, childbirth, accident, etc.) that do not permit the student to study, she may request a leave of absence at any time after registering for a degree program. In other cases, requests for a voluntary leave of absence can be made only after the successful completion of the first term of studies. Doctoral students should consult the Doctoral Regulations for the rules concerning the application for a leave of absence (under the category of “Withdrawing from the program”). In case of approval, the department coordinator notifies the Students Record Office which changes the student's status to “leave of absence: personal” (in case of personal circumstances preventing study) or “leave of absence: voluntary” (in case of voluntary leave of absence). **The maximum total duration of all leaves of absence (granted to a student in one or several instances) is two academic years.** The maximum total duration of voluntary leave of absence is one academic year.

The [CEU Doctoral Regulations](#) on leave of absence: A candidate may request permission from the Doctoral Program Committee to temporarily withdraw from the Doctoral Program **for a period of up to 2 years**. Such request should be properly justified, and the period of withdrawal clearly indicated (dd/mm/yy -dd/mm/yy). Some of the reasons that entitle to a withdrawal include parental duties, pressing family circumstances and other full-time obligations that prevent the student from making progress with their Dissertation.

A candidate granted leave must request re-enrolment with the Doctoral Program Committee when the withdrawal period lapses. It is also possible to request re-enrolment before that time. The time of enrolment prior to withdrawal is counted towards the 6-year period within which a Dissertation can be submitted.

At the end of each academic year, the Student Records office prepares and sends to every doctoral student a statement detailing the number of months of stipend used and the number of months remaining.

WORKING AND CEU FUNDING

No doctoral student receiving a CEU stipend may be employed by CEU or any other employer. If a PhD student intends to work while being enrolled in the PhD program of CEU Department of Network and Data Science, she or he immediately must “stop the clock”. In exceptional cases, permission to take up paid employment can be given by the Head of the Department and the Doctoral Program Committee. No permission is granted, however, before the acceptance of the Detailed Research Proposal. Advanced students who are on a write-up grant cannot normally have any other paid or unpaid work commitment.

NON-SCHOLARSHIP WORK SCHEME

Doctoral students who have exhausted their 36 months of doctoral stipend, but who have the department's endorsement can apply for a “non-scholarship work scheme” to be employed at CEU for up to six months. The Office of Student Services will handle the applications and placements, in consultation with the departments.

DOCTORAL RESEARCH SUPPORT

The pursuit of individual scholarship opportunities is encouraged and may be tied in with the selection of an external member of the committee for the Comprehensive Exam or Dissertation.

In all cases the students should schedule their Study Abroad to provide maximum effectiveness in their overall Dissertation research and **should not schedule Study Abroad or Exchange programs that conflict with residential requirements for CEU Budapest in the first or final years.**

For up-to-date information on doctoral research support schemes and opportunities, please consult the webpage [Grants for Enrolled Students](#).

DOCTORAL RESEARCH SUPPORT FOR STUDY ABROAD

CEU students approved for full doctoral candidacy are encouraged to pursue their dissertation research and to build international scholarly contacts through a special study abroad program. CEU has a [Doctoral Research Support Grant](#) program (DRSG), which enables a short research stay abroad. Students may apply to recognized universities, institutes or research Departments abroad to spend **up to three months** as “visiting/research scholars”. This scheme is an integral part of the CEU doctoral program.

The DRSG will be considered in addition to the regular CEU stipend funding of 36 months. Grant recipients may wish to “[stop the clock](#)”, i.e. to temporarily halt payment of their stipend. It is the student's responsibility to gain all information on what “stopping the clock” entails. The [Financial Aid Office](#) will be able to help with this.

The DRSG is given within the limits of CEU's academic and financial year. Therefore the scheme should commence and be completed within the August 1 - July 31 time frame.

In each academic year the application deadline will be made known at least six months in advance with a reminder sent at least two months in advance. Students are encouraged to make contacts with potential host institutions as soon as possible after their comprehensive exams. Finalizing

arrangements will take time, students are responsible for ensuring that all arrangements are in place by the deadline (the committee will not consider applications without confirmations from the host institution and will not grant an extension).

ELIGIBILITY

The DRSG Program is open to every CEU doctoral student who has passed the comprehensive exam. Pre-comprehensive students (normally first year students) may not submit an application.

CEU doctoral students are not eligible to apply for multi-year PhD programs abroad. They are eligible for the DRSG (including exchange programs) of up to one year but can receive CEU funding for studies abroad one time only during their doctoral studies.

Students must have been admitted to a university or research institute as “special” or “non-degree” students and must have received some form of financial support (fee waiver, assistantship, etc.) for the period of their research. The CEU grant is designed to be supplementary and covers mainly travel and subsistence costs.

SELECTING A HOST INSTITUTION

CEU has [partnerships](#) with institutions and universities across the globe, offering opportunities for our students to benefit from and contribute to the development of new knowledge in a wide variety of fields.

CEU is an active member of the European University Association and of the Council of Graduate Schools in the US.

When selecting an institution for the Study Abroad scheme, doctoral students are advised to consult their supervisors on the best choice.

4. THE DISSERTATION AND COMPLETION OF THE PHD DEGREE

MAXIMUM DURATION OF PHD STUDY

Doctoral students at CEU must defend the doctoral Dissertation within **six years** after enrollment in the program, and must submit the draft no later than **six months before** that deadline.

THE DISSERTATION COMMITTEE

In accordance with the university doctoral regulations, the Dissertation Committee is responsible for the examination of the student's doctoral thesis. At least six months prior to the submission of the Dissertation the candidate initiates at the Doctoral Committee the process of defense. The first step is to select the internal members of the Dissertation Committee.

The Committee will have at least four members:

- Chair of the Committee (professor of CEU)
- Supervisor of the Dissertation (without vote)
- Professor (of CEU or not from CEU, examiner)
- Professor (not from CEU, examiner)

The names of these members of the Dissertation Committee should be communicated to the PhD coordinator. All Dissertation Committees are subject to approval by the Doctoral Studies

Committee. The Dissertation Committee has a chair and at least three members. The two examiners will be asked to provide a written report on the thesis. One of the examiners must be external to CEU. If necessary, e.g., due to the topic of the dissertation or to assure the sufficient number of external members of the Committee, more than four members can be chosen.

To satisfy the degree requirements, the Dissertation must make a significant and original contribution to the knowledge and understanding of the subject and must demonstrate the capacity of the candidate to carry out independent quality research. The Dissertation Committee decides about the acceptance of the thesis based on the majority voting principle, and accordingly may recommend the candidate to be awarded/not to be awarded the doctoral degree. In case of substantial differences in the examiners' recommendations, the Doctoral Committee must appoint additional examiners.

SUBMISSION OF THE DISSERTATION AND ARRANGEMENT OF THE DEFENSE

SUBMISSION

The first step in completing PhD studies is the submission of *three copies* of the final version of the PhD Dissertation to the departmental coordinator for distribution (in the departmental office). The Dissertation should be between 70 and 100 A4 pages, with 12p times new roman letters, single spacing, 6p paragraph separation, 28 mm side margins and 45 mm top and bottom spacing, including formulas, tables, notes, bibliography, appendices, summary and figures; maps and computer programs may be added. The three hard copies of the Dissertation must be spiral bound (1 copy is for the supervisor, the second is for the internal examiner and the third is to be sent out to the external reader. One of them might be sent to the library after the defense if no changes are needed.) The Dissertation shall be *uploaded into the ETD system* following the rules and guidelines. The student needs to be enrolled in order to access the ETD system, in case of a terminated enrolment, please turn to the Coordinator who can ask for a temporary enrolment from the Student Records Office. The final version of the Dissertation, after possible modifications following the defense, should be uploaded to the ETD after the defense.

The submitted thesis shall include:

1. a title page including the authors name, date of submission, supervisor's name, the name of the University and the name of the Department;
2. a table of contents;
3. an abstract of maximum 500 words;
4. a signed statement that the thesis contains no materials accepted for any other degrees in any other institutions;
5. a signed statement that the thesis contains no materials previously written and/or published by another person, except where appropriate precise acknowledgment is made in the form of bibliographical reference;
6. if the work is based on joint research, disclosure of the respective contribution of the authors;
7. attached copies of the publications by the candidate in the theme of the thesis (if any).

The thesis is considered ready to defend when the supervisor and at least one other member of the student's supervisory panel approve it. If either the supervisor or any other panel member decides it is not ready to defend, then that person must provide the student with detailed justification for the negative judgment. If the student disagrees with this negative judgment, he or

she may appeal to the Doctoral Committee. In case the Committee also deems the Dissertation not ready to defend, the justification for this judgment must be communicated to the supervisor and the student.

PREPARATION OF THE DISSERTATION DEFENSE

The defense of the final draft of the Dissertation may be scheduled at the earliest two months after submission. Following the submission, the student and the supervisor will contact the PhD Program Director and PhD Coordinator to specify the exact date and time of the defense and the names of the members of the Dissertation Committee.

ARRANGEMENT FOR THE PHD DEFENSE

The Director of the PhD Program will send out the invitations to external members and makes sure that all requirements have been met. The PhD Coordinator will arrange the room for the Dissertation defense; arrange the travel and accommodation of the external members who attend the defense; and make sure that the Dissertation is accessible in the library for two weeks prior to the defense.

The Defense is open to the public.

PHD DEFENSE PROCEDURE

1. Head of department or the PhD Program director welcomes all present and introduces the chair of the Dissertation Committee.
2. The Chair introduces the other members of the Committee and requests (a member of the Department) to keep the minutes of the proceedings.
3. The Chair of the Dissertation Committee opens the proceedings:

"This is the public defense of the doctoral Dissertation ofon..... Optional: The external reader (who is not present at the defense) has sent his/her comments in advance. As he/she agreed that the Dissertation is suitable for public examination, I request the candidate to summarize briefly the main points of the Dissertation."

4. Candidate summarizes his/her findings (max. 20 minutes).
5. In case of an external reader the Chair of Dissertation Committee reads out loud the external readers' critique. The examiners summarize briefly their opinion and critique of the Dissertation.
6. Chair of Dissertation Committee gives the floor to the candidate to respond to the critical comments of the external reader and of the other examiners (max. 25 minutes).
7. Chair of the Dissertation Committee opens the examination by asking members of the board to raise questions or comments about the Dissertation, the candidate's summary and his response to the critique: first the members of the Dissertation Committee, then the Dissertation supervisor. Candidate may wish to reply to every question separately or at the end of the questions (usually not more than 15-25 minutes).
8. Chair of Dissertation Committee invites the public to raise questions or make comments on the Dissertation, which has been accessible to the public in the CEU Library for two weeks before the defense.

9. After questions from the floor, to which the candidate may reply singly or in summary, the Chair of the Dissertation Committee asks the members of the board, whether they have any further questions or comments. Thereafter the Chair announces that the Dissertation Committee is going to retire for adjudication and suspends the proceedings.
10. The Dissertation Committee has to decide by simple majority vote between three options: (I) to accept the Dissertation and defense and propose to the Senate and Rector to grant the Ph.D. degree, or (II) reject the Dissertation, or (III) refer the Dissertation for serious revision after which it (a) should be approved by a person designated by the Dissertation Committee, or (b) submitted to a repeated public defense. (At a repeated defense only options I and II remain.) Minor formal corrections suggested by the examiners need not be expressly stipulated. The Dissertation Committee produces its judgment in writing, in ca. 100-200 words, signed by all voting members of the Committee.
11. The Chair of the Dissertation Committee announces the decision of the Dissertation Committee and reads, or paraphrases the summary of the assessment. In case of (I), the Chair congratulates the candidate for the successful completion of the requirements of the PhD in Network Science. In case of (II), regrets the failure, in case of (III) specifies the Board's requirements for corrections, the approval procedure and/or the need for a repeated public defense. The Chair finally thanks the members of the Dissertation Committee and the public for their participation and closes the proceedings.

(The entire proceeding should not take longer than two hours, unless special circumstances so warrant it.)

AWARDING OF THE PHD DEGREE

The successful defense of the PhD Dissertation will entitle the doctoral candidate to receive the Doctorate in Network Science granted by the Senate and the Rector. The diploma will state that the doctoral degree has been accredited by the Board of Regents of the State of New York (U.S.). The degree will be formally awarded at the graduation ceremony held in June of each academic year.

5. DEPARTMENTAL FACULTY AND DOCTORAL COMMITTEE

FACULTY

János Kertész, Professor, Head of Department, PhD Program Director, Nádor u. 11., Room 610, kerteszi@ceu.edu

Balázs Vedres, Associate Professor, Nádor u. 11., Room 612, vedresb@ceu.edu

Albert-László Barabási, Visiting Faculty, Nádor u. 11., Room 609, barabasi@gmail.com

Roberta Sinatra, Assistant Professor, Nádor u. 11., Room 609, sinatrar@ceu.edu

Michael Szell, Assistant Professor, Nádor u. 11., Room 601, szellm@ceu.edu

Gerardo Iñiguez Gonzalez, Assistant Professor, Nádor u. 11., Room 308, gonzalezg@ceu.edu

AFFILIATED FACULTY

Ádám Szeidl, Professor, Department of Economics, Nádor u. 13., Room 509, szeidla@ceu.edu

Pál Hegedűs, Assistant Professor, Department of Mathematics, Zrínyi u. 12., Room 312, hegedusp@ceu.edu

Károly Böröczky, Professor, Department of Mathematics, Zrínyi u. 12., Room 302, boroczkyk@ceu.edu

DOCTORAL COMMITTEE

János Kertész (chair)

Balázs Vedres

Roberta Sinatra

Michael Szell

Gerardo Iñiguez Gonzalez

Student representative

6. ONLINE COURSE EVALUATION

Central European University uses an online system, CoursEval, for course and teacher evaluations. Students are asked to evaluate their courses at the end of each. The CoursEval system is entirely independent of all other university systems. It is managed solely by the Institutional Research Office at the Office of the Provost. All surveys are anonymous; neither the numeric nor the text answers can be linked to the individual respondents. Faculty members receive a report on their evaluations after they have uploaded all the grades to Infosys, they do not have access to the names of individual students.

ANNEX I. CEU DOCTORAL CANDIDATE PROGRESS REPORT

CEU Doctoral Candidate Progress Report

Note:

This form is part of the annual review of each doctoral student following CEU regulations. It is to be filled out by the doctoral student and submitted to the departmental doctoral committee. The committee will review the form together with the supervisor's report and they will write a follow-up letter with recommendations for concrete actions for the student and supervisor for the next reporting period.

For period from:		To:	
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Section A: Information on program, supervisor, thesis
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Name	
Start date of doctoral program	
Start date of research period	
Supervisor(s)	1. 2.
Thesis provisional title:	
Thesis submission (planned date):	

Section B: Student's Report on Progress

Comments on work and training completed and on academic progress

1. Status of research

2. Thesis Preparation and Writing Progress:

3. Publishing activities, conferences, external grants, write-up grants (with dates), if any

4. Teaching and other professional development activities, if any:

5. Frequency of supervision meetings:

6. Specific problems encountered:

7. Other comments:

Section C: Planned activity for the next report period

Signature:

Date:

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ANNEX II: CHECKLIST FOR THE DETAILED RESEARCH PROPOSAL

- Is the research question clear?
- Is the substantive relevance of the proposed research clear?
- Is the relevance of the proposed research for network science clear?
- Are all relevant literature discussed?
- Are the connections of the proposed research with the literature clear?
- Is there a logical connection between the research question, the methodology and the presented literature?
- Are the data sufficiently described?
- Will the analysis of the data significantly contribute to answering the research question?
- Is the presentation of the methodology satisfyingly complete?
- Is the availability of data assured?
- Can the research be fit into the time and resource constrains?
- Are the issues of data security, privacy, and ethical aspects well described and manageable?

ANNEX III: FRONT PAGE OF THE DETAILED RESEARCH PROPOSAL

THIS IS THE TITLE OF THE RESEARCH PROPOSAL
Research Proposal within the Network Science PhD
Program

by

Name of the Student

Supervisor: Prof. Name Name

Second Reader: Prof. Name Name (if there is one)

CEU, YEAR