Guidelines for the completion of the essay to the network course of Peter Csermely

For the completion of the course a 5 to 10 page essay is needed. Please find detailed instructions how to write this essay below.

1. Preparation to write the essay

To write the essay you should read these 3 basic papers/books first:
http://barabasi.com/networksciencebook/
http://linkgroup.semmelweis.hu/weaklinks_EN.php
http://linkgroup.semmelweis.hu/docs/13PharmTher.pdf
English slides of the lectures can be downloaded from here:
http://www.linkgroup.hu/education.php

The essay should use minimum 3 additional research paper references besides the 3 compulsory references listed above. You may explore these additional papers by finding the papers cited in the above 3 works, or by searching PubMed here:
https://www.ncbi.nlm.nih.gov/pubmed/advanced
(changing All Fields to Title+Abstract and using phrases in quotation marks,
like "signaling network" will help to reduce the number of papers found)
or Google Scholar here http://scholar.google.com
Papers found can be downloaded from http://scholar.google.com or from http://sci-hub.tw

2. Format requirements

There is no particular format-requirement of the essay. (However, well-formatted, "neat" essays will reach a higher grade.) Use double space if you want. Pictures and Tables are most welcome but please make sure that they are substantiating your message and are not just illustrations. Please cite the original source of Figure/Table. (If you make your own pictures and tables, these will upgrade the mark given to your work.)

If you want a higher mark, please make sure that you cited all references used in the paper and applied the same style for all references like e.g. this one:

1. Csermely P, Korcsmáros T, Kiss HJ, London G, Nussinov R. (2013) Structure and dynamics of molecular networks: a novel paradigm of drug discovery: a comprehensive review. Pharmacol Ther. 138: 333-408.

3. Definition of the „new idea" which should be included to the essay

"New idea" means that you should make a summary of a certain, network related-topic using your own words summing up related segments of the 3 papers above and combining the 3 additional research papers to your arguments.

Feel free to formulate open, research questions (you may find some of these open questions in my book, try to find similar ones), or expose an idea as a possible solution to a network-based problem, based on the literature evidence you read and cited in your essay. Please note that simple summaries of 3+3 papers will get a low mark. These also mean that the title and content of the essay is up to your decision. However, please note that the essay has to be linked to networks. Otherwise it will be rejected and you have to submit a new one, to get a valid mark.

Potential solutions to these requirements are found at the end of the email.

4. Definition of „network-related”
"Network-related" means here that you have to apply the basic concepts and definitions of network science found in the 3 intro papers above (such as hubs, small-world-ness, modules, bridges, bottlenecks, network core/periphery, hierarchy etc. etc.) to a specific network or a specific field described in the additional 3 papers as references.

5. Specific warning about copy-pasted sentences
Essays which contain copy-paste parts of published material (or another essay) will also be rejected. Please note that your essay should not contain any copy-pasted sentence.

6. Sample essays receiving a mark "5" before
Please find here 5 sample essays receiving a mark "5" before:
http://linkgroup.hu/education.php

----------Addendum----------
In an ideal case, your essay containing novel idea should have 3 parts:
Part A sums up some major concepts of network structure or dynamics such as hubs, modules, bridges, hierarchy, core/periphery or network perturbations, spread in networks, jams in networks, damage of networks, attractor changes of networks etc. etc. This is done using the 3 basic literature I gave. This should be 1 or 1.5 pages.

Part B sums up the properties of a selected network which may be chosen as a reference paper from the 3 basic literature or any other network of your free choice including e.g. the network of your own friends. This is already a "new idea" since the selection and description of the real-world network is your own work. This should be 1 or 1.5 pages.

Part C is the really "new idea", where you apply the basic concepts described in part A to the network described in part B. If the network was analyzed in the original paper from one point of view already (like hubs) please extend your rational to judge the potential other properties of the network like modules, bridges etc. If some of you may want to measure these (which is NOT necessary) you may download programs for this here
http://linkgroup.hu/links.php#Networkanalysis
and network data from here
http://linkgroup.hu/links.php#Networkdatasets
Part C should be 2 to 3 pages.

Alternatively, you may assess some properties of a network. Network data can be found here
http://linkgroup.hu/links.php#Networkdatasets
(You may also evaluate your own friendship network, too.)
Network analysis methods can be found here
http://linkgroup.hu/links.php#Networkanalysis
In this case please make some arguments evaluating the data you received.

Only a "soft copy" of your essay is needed to be sent to csermelynet@gmail.com

Do not hesitate to contact me at the above email address if you have further questions.

Prof. Peter Csermely