As part of your course grading, you are required to submit an academic research paper during the semester. This exercise is meant to inculcate in you the research temperament and skills by carrying out a deep study of any research topic/area relevant to this course. You may choose any topic, of your interest, relevant to the course. Following are the details of academic research paper: requirements, deadlines and marks.

Academic Research Paper Requirements:  
Following are the requirements for the academic research paper:  
a) Paper Length  
Your paper should not be less than 6 pages and not more than 12 pages.  
b) Quality of Writing  
The clarity and style of expression, the degree to which your paper obeys the rules to formal academic grammar, punctuation, spelling, formatting details like paragraph indentation and location of page breaks, are part of quality of writing. Write and edit your paper carefully for good organization, clear language with good spelling, punctuation, etc.  
c) Format  
Your academic research paper must have these sections: Abstract, Introduction, Related Work, Analysis and Conclusion. You must have to follow IEEE format strictly. The format is available in MS-WORD format (Click here to download). No academic research paper will be accepted without mentioned format.  
d) References  
You must have to study published research papers (minimum 10). The references of published research papers and books are allowed. Any unauthorized materials’ references will not be acceptable.

You can access Research Papers on your VULMS account using link [HEC Digital Library], Google Scholar and other online free research paper repositories.

Submission and Deadlines  
Students are required to finalize and submit their academic research paper by July 24, 2020.

Academic research paper must contain implementation results of the proposed research idea. Similarly, in case of a review paper the “Discussion” section must contain student’s comments/conclusions and future research agenda regarding the domain being reviewed.

Presentation  
Students will be required to give presentation (through Skype/TeamViewer/Recorded-presentation etc.) of their academic research paper, well before final-term examinations. The detailed schedule for the presentations will be communicated with the students later.

Team  
Students can do this assignment in groups but in that case their academic research paper must be of high quality justifying the efforts of all the members in the group.

Warning: Write in your own words, do not copy-paste. Plagiarism is not acceptable. In case plagiarism is found, you will be awarded zero marks. No excuse will be accepted in this regard. For further understanding about plagiarism, please follow the links:  
Little Book of Plagiarism  
HEC Policy about plagiarism.

For further information and guidelines on writing a research paper, please follow the link:  
Guidelines and Requirements for Writing a Research Paper

Date of presentation of the academic research paper shall be announced later.  
Topic for Research Paper  
Few topics are given below. However, students can select their own topic.

1. Complex stochastic systems
2. Harmonic analysis and applications
3. Markov processes and applications
4. Hidden Markov Models and applications
5. Random dynamical systems
6. Bayesian Learning and applications
7. Studies on Dynamic and Probabilistic Systems
8. Probabilistic models in Machine Learning
9. Monte Carlo Methods and its applications
10. Stochastic modelling and its applications  
    If you want to select any other topic of your choice related to this course then get approval first via course email [CS723@vu.edu.pk](mailto:CS723@vu.edu.pk) before starting work.  
    In case of any confusion, send e-mail at course e-mail address.