

Academic Org: Dept of Computer Sci & Engg – Subject: Computer Science

Course: CSCI4190 **Course ID:** 009646 **Eff Date:** 2022-07-01 **Crse Status:** Active **Apprv. Status:** Approved **[Course Rev]**
Introduction to Social Networks 社交網絡導論

This course introduces how the social, technological, and natural worlds are connected, and how these relationships can be modeled as high dimensional graphs. The use of algorithmic approach to study these large scale networks so as to shed light on their connections and intrinsic properties will be employed. Topics include: 1) how opinions, personal interests, idea, news and political movements spread via social networks; 2) how to maintain the robustness of the world wide web; 3) why we observe fragility in some of our electrical networks; 4) understand the formation process of large scale online social networks like Facebook; 5) how to perform effective product advertisement in large scale online social networks; and 6) how information or virus can be propagated in these large scale online social networks. This course aims to provide simple but fundamental theories on how one can understand the formation and interaction on these social networks. This course is multi-disciplinary in nature, and it is suitable for engineering, science, mathematics, economics or business students.

本科介紹如何在社會，科技和自然世界的連接，可以把它們的關係模擬為一個高維圖。本科介紹如何使用算法理論來研究這樣的大規模高維圖，以揭示出其內在聯繫和性能。主題包括：1)如何意見，個人利益，思想，新聞和政治運動等在社交網絡傳播；2)如何保持穩健的萬維網；3)為什麼一些輸電網絡具有內在的脆弱性；4)大型在線社交網絡如Facebook的形成過程；5)如何在社交網絡上進行有效的產品廣告；以及6)信息或病毒如何可以在大型在線社交網絡上傳播。本科旨在提供簡單而基本的理論來理解社交網絡的形成和相互作用。這是多元學科性的課程，適合工程，科學，數學，經濟學或商學的學生。

Grade Descriptor:

A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

有關等級說明的資料，請參閱英文版本。

B

GOOD – good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

有關等級說明的資料，請參閱英文版本。

C

FAIR – adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

D

MARGINAL – performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

F

FAILURE – performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

有關等級說明的資料，請參閱英文版本。

Equivalent Offering:

Units: 3 (Min) / 3 (Max) / 3 (Acad Progress)

Grading Basis: Graded

Repeat for Credit: N

Multiple Enroll: N

Course Attributes:

Topics:

COURSE OUTCOMES

Learning Outcomes:

Students will be able to

1. understand the concepts and principles of social networks;
2. understand how various factors may influence the formation of social networks;
3. apply simple algorithms to extract information from these online social networks.

Course Syllabus:

This course introduces how the social, technological, and natural worlds are connected, and how these relationships can be modeled as high

dimensional graphs. The use of algorithmic approach to study these large scale networks so as to shed light on their connections and intrinsic properties will be employed. Topics include: 1) how opinions, personal interests, idea, news and political movements spread via social networks; 2) how to maintain the robustness of the world wide web; 3) why we observe fragility in some of our electrical networks; 4) understand the formation process of large scale online social networks like Facebook; 5) how to perform effective product advertisement in large scale online social networks; and 6) how information or virus can be propagated in these large scale online social networks. This course aims to provide simple but fundamental theories on how one can understand the formation and interaction on these social networks. This course is multi-disciplinary in nature, and it is suitable for engineering, science, mathematics, economics or business students.

Assessment Type:

Essay test or exam	: 50%
Others	: 50%

Feedback for Evaluation:

1. Course evaluation
2. Qualitative feedback from students
3. Quality on students projects, which can be used to evaluate whether the students obtain a good understanding of the material.

Required Readings:

Networks, Crowds, and Markets: Reasoning About a Highly Connected World, by David Easley, Jon Kleinberg. Cambridge University Press, 2010.

Recommended Readings:

1. Social and Economic Networks, by Matthew O. Jackson. Princeton University Press, 2008.
2. Computational Social Network Analysis: Trends, Tools and Research Advances, Ajith Abraham, A.E. Hassanien, V. Snasel. Springer, 2010.

OFFERINGS

1. CSCI4190 Acad Organization=CSD; Acad Career=UG

COMPONENTS

LEC : Size=30; Final Exam=Y; Contact=3
TUT : Size=30; Final Exam=N; Contact=1

ENROLMENT REQUIREMENTS

1. CSCI4190 **Enrollment Requirement Group:**
Pre-requisite: CSCI2100 or 2520 or ESTR2102.

New Enrollment Requirement(s):
Pre-requisite = no change

CAF

eLearning hrs for blended cls 0
No. of micro-modules 0
Research components (UG) 50%-74%

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