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| **DEREE COLLEGE SYLLABUS FOR:**  ITC 4541 WEB SCIENCE  **3/0/3**  (Previously ITC 4441) | |
| (Updated Spring 2016 ) **UK LEVEL 6**  **UK CREDITS 15** | |
| **PREREQUISITES:** | ITC1070 LE Information Technology Fundamentals –or-  CS1070 Introduction to Information Systems  ITC 2188 Introduction to Programming  ITC 3234 Object Oriented Programming  MA 2010 Statistics I  ITC 3260 Fundamentals of RDBMS |
| **CATALOG**  **DESCRIPTION:** | Social network characteristics. Network measures and models. Data mining in social networks. |
| **RATIONALE:** | The course aims to acquaint students with methods of analysis of online social networks that include modelling at the micro, meso and macro scale. Moreover, the course also aims to mine the information that is stored in social networks. |
| **LEARNING OUTCOMES:** | As a result of taking this course, the student should be able to:   1. Adapt or combine network measures to construct social or generalised information network models 2. Design methods to mine the structural and content information in social or generalised information network models 3. Formulate techniques that are based on structural or content information to build recommender systems or systems that extract higher level modalities |
| **METHOD OF Teaching AND LEARNING:** | In congruence with the teaching and learning strategy of the college, the following tools are used:   * Classroom lectures, discussions, and review of real-world cases based on specific theoretical concepts. * Laboratory practical sessions. * Office hours: Students are encouraged to make full use of the office hours of their instructor, where they can ask questions and go over lecture material. * Use of the Blackboard Learning platform, where instructors post lecture notes, assignment instructions, timely announcements, as well as additional resources. |
| **ASSESSMENT:** | **Summative:**   |  |  | | --- | --- | | Midterm Examination (Problem solving or short essay questions) | **40%** | | Project (Programming or user of tools to model or analyse a social network) | **60%** |   **Formative:**   |  |  | | --- | --- | | Laboratory exercises & in class quizzes | **0** |   The formative assessments aim to prepare students for the final examination and the programming project  The midterm examination tests learning outcome 1  The project tests learning outcomes 1, 2, 3  (Guidelines and assessment rubrics are distributed on the first day of classes along with the course outline.) |
| **INDICATIVE READING:** | **REQUIRED READING:**  Zafarani, R., Abbasi, M.A. & Liu, H., (2014), *Social Media Mining, An Introduction*, Cambridge  **RECOMMENDED READING:**  Aggarwall Ch. C., (2015), *Data Mining*, Springer  Easley, D., & Kleinberg, J. (2010). *Networks, crowds, and markets reasoning about a highly connected world*. New York: Cambridge University Press.  Jannach, D., Zanker, M., Felfernig, A., Fruedrich, G., (2010) *Recommender Systems, an Introduction*, Cambridge  Manning, C., & Raghavan, P. (2008). *Introduction to information retrieval*. New York: Cambridge University Press.  Newman, M. (2010). *Networks: An introduction*. Oxford: Oxford University Press.  Russell, M. A., (2013), *Mining the Social Web*, O’Reilly  Social Networks Journal, Elsevier <http://www.journals.elsevier.com/social-networks> |
| **INDICATIVE MATERIAL:**  *(e.g. audiovisual, digital material, etc.)* | **REQUIRED MATERIAL:** N/A  **RECOMMENDED MATERIAL:** N/A |
| **COMMUNICATION**  **REQUIREMENTS:** | Daily access to the course’s site on the College’s Blackboard CMS. Effective presentation skills using proper written and oral English. Communicate and coordinate during team activities. |
| **SOFTWARE**  **REQUIREMENTS:** | Indicative list of software:  Pajek <http://mrvar.fdv.uni-lj.si/pajek> /  Cfinder <http://www.cfinder.org/>  NodeXL <http://nodexl.codeplex.com> /  Gephi <https://gephi.github.io> /  Weka <http://www.cs.waikato.ac.nz/ml/weka> /  Python Programming Language  NetworkX library for Python <https://networkx.github.io> /  Java Programming Language  Mongo Database: <https://www.mongodb.org> |
| **WWW RESOURCES:** | Social Network Analysis: <http://www.barabasilab.com/pubs-socialnets.php>  Social Network Analysis Project, Stanford <http://snap.stanford.edu>  Network Science book, <http://barabasi.com/networksciencebook>  Social Media Lab <http://socialmedialab.ca>  Java Library <http://jgrapht.org/>  Data set collection: <http://grouplens.org/datasets/movielens/>  Data set collections <http://www-personal.umich.edu/~mejn/netdata/> |
| **INDICATIVE CONTENT:** | 1. Introduction to social media mining  2. Introduction to Networks of information, user and others  3. Network Measures  4. Network Models  5. Community detection  6. Information Retrieval  7. Data Mining  8. Information diffusion  9. Recommender Systems |