TOWSON UNIVERSITY

Department of Computer and Information Sciences

AIT 790 – Research Methodology, IT Technical Writing and Presentation
Fall 2019

Instructors: Dr. Chao Lu and Dr. Joyram Chakraborty
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Office Hours: To be announced by email and by appointment

Course Hours: 3-credit hours
Course Location: To be announced
Course Website: Blackboard

Prerequisite: D.Sc. in IT Admission Status (Or permission by program director)

Course Description:
The aim of this course is to teach students fundamental research skills and methods necessary to perform and disseminate quality research. Quantitative and qualitative research methods, data analysis approaches and/or algorithmic proofs will be introduced. The format of the course will consist of lectures, group discussions, and student presentations. Students will research an area of interest, including an in-depth literature search of appropriate conference proceedings and journals. After instructor approval of the selected papers (based on their cohesiveness, integrity, and significance to the topic), students will write a research project proposal that includes an introduction to the problem, a section on the literature search performed, and discussion of the research methodology used. Students will be required to give a final presentation.

Learning Outcomes:

Upon completion of this course, students will be able to:
1. Understand various kinds of research methods such as: quantitative and qualitative methods, feasibility study, observational study, case study, and literature survey, etc.
2. Formulate research questions and know how to validate them.
3. Apply appropriate research methods to address the research questions according to specific context.
4. Design and implement appropriate data collection methods, such as interview, survey, focus group, expert review and onsite observation.
5. Conduct data analysis and appropriately interpret the results.
6. Understand basic statistical analysis such as mean, deviation, and statistical significance. Explain the significance, assumptions, and limitations of basic statistical methods.
7. Present data and results by writing publishable research/technical papers.

Course Materials:

Collected papers and handout material.
Additional reading material will be posted on Blackboard (blackboard.towson.edu).

Assignments:

Each student will choose an area of research interest with the help of the instructor, then each student will select at least 10 research papers of appropriate conference proceedings and journals. After instructor's approval of the selected papers (based on their cohesiveness, integrity, and significance to the topic), each student will write a research project proposal that includes an introduction to the problem, a section on literature review, and discussion of the research methodology used, and potential research directions. Students will be required to give a final presentation and a final report.

Course **Format\credits:**

Lecture format, once a week for 3 hours (3-credit course).

Grading Policies

Grade Distribution:
Lecture attendance and active participation (10%)
Research topic survey (20%)
Research proposal and term paper (30%)
Presentation (15%)
Exam (25%)

The following is the letter grading policy for this course:

A	93-100
A-	90-92.99
B+	85-89.99
B	80-84.99
C	70-79.99
F	Below 70

Academic dishonesty will result in a grade of F.

Course Policies:

Attendance Policy: This class only meets once a week, hence attendance is vital. In the event of an emergency, please notify the instructor in advance. The instructor reserves the right to approve absences and request verification.

Posting of Grades: Grades for the semester can be accessed online.

Academic Integrity: Academic honesty is strongly observed. This course consists of both individual and team assignments. A team project is an assignment in which collaboration is allowed and highly encouraged. However, the work of the team *must* be of the team's creation and

not plagiarized from other sources. Individual assignments *must* reflect the work of the individual student and of his/her creation. While studying together, discussion and collaboration is encouraged, individual assignments *must be individually prepared* – copying or sharing files, diagrams and/or code is considered cheating. The penalty for cheating will, at a minimum, consist of a grade of zero for the dishonest work and may lead to the possibility of **course failure** depending on the severity. Students are responsible for reading and knowing Towson University's policy regarding academic integrity, which can be found online.

Students with Disabilities:
This course is in compliance with Towson University policies for students with disabilities. Students with disabilities are encouraged to register with Disability Support Services (DSS), 7720 York Road, Suite 232, 410-704-2638 (Voice) or 410-704-4423 (TDD). Students who suspect that they have a disability but do not have documentation are encouraged to contact DSS for advice on how to obtain appropriate evaluation. A memo from DSS authorizing your accommodation is needed before any accommodation can be made."

Incomplete Policy:
Students will not be given an incomplete grade in the course without sound reason and documented evidence as described in the Student Handbook. In any case, for a student to receive an incomplete, he or she must be passing and must have completed a significant portion of the course.

Class Tentative Schedule*:

Weeks	Content
1	Introduction
2	Research methods
3	Research methods
4	Technical writing
5	Technical writing
6	Paper selection and validation
7	Research proposal draft and format
8	Lecture and Group discussion
9	Lecture and Group discussion
10	Student presentations
11	Invited talks and Group discussion
12	Invited talks and Group discussion
13	Invited talks and Group discussion
14	Term project presentation
15	Exam

*Subject to change.

Course Rationale: The course will be a required course for all D.Sc. in IT students. Students are expected to complete it (with a grade of B or better) before taking the qualifying exams. Students who have not yet taken this course may not register for dissertation credits.

Overlap Statement: The course does not conflict or overlap with any other courses required by the D.Sc. in IT program.

Resource Requirements: Existing resources are adequate for this course.

References:

Hossein Hassani, "Research Methods in Computer Science: The Challenges and Issues", March, 2017.

Demeyer, S. (2011). Research methods in computer science. In 27th IEEE International Conference on Software Maintenance (ICSM).

Grbich, C. (2013). Qualitative data analysis: An introduction (2 ed.). Sage.

Vera Goebel and Thomas Plagemann, "Research / Scientific Methods in Computer Science", Department of Computer Science, Iowa State University, 2000.

Ken Peffers , Tuure Tuunanen , Marcus A. Rothenberger & Samir Chatterjee, "A Design Science Research Methodology for Information Systems Research", Journal
 Journal of Management Information Systems, Dec 2014.

Lazar, J., Feng, J. H., & Hochheiser, H. (2017). Research methods in human-computer interaction. Morgan Kaufmann.

Kaplan, B., & Duchon, D. (1988). Combining qualitative and quantitative methods in information systems research: a case study. MIS quarterly, 571-586.

Venkatesh, V., Brown, S. A., & Bala, H. (2013). Bridging the qualitative-quantitative divide: Guidelines for conducting mixed methods research in information systems. MIS quarterly, 37(1).

Brannen, J. (2017). Mixing methods: Qualitative and quantitative research. Routledge.