The ability to write cogently, concisely, and clearly in an acceptable academic format and to present the results of your research orally are skills you must develop to be a success in our program. At the same time, you will be learning skills essential to success in your working life after graduation, as the ability to communicate clearly in written and spoken English is one of the most important elements to success in business. You will regularly be expected to submit research papers and project reports as you progress through our program. Here’s some key advice to help you succeed.

**Format of Research Papers:** Unless your professor gives you different instructions, you should prepare ITM research papers in the formats prescribed by the Publication Manual of the American Psychological Association, (commonly referred to as APA), which are very common styles in use for scholarly publications and academic papers. APA format is the ITM Department format and is the most common in computing disciplines. Among other things, APA format means that you should submit your paper typed in 10, 11, or 12-point type (no larger than 12-point), double-spaced, with 1 inch margins on one side of 8½ inch by 11 inch paper or the digital equivalent. Quotations, figure captions and the list of references should all be double-spaced. Devote separate pages to each figure, each table and the list of references, and number all pages after the first. Attach a cover sheet listing the paper title and the name and email address of the author. If submitting electronically, please submit as a PDF file or in Rich Text Format. Most word processors can save as RTF. Your professor may prescribe specific required or acceptable electronic formats. (See pages 4 and 5 of this document for information on formatting your Master’s thesis or formatting papers submitted for academic journal or conference publication.)

**Title:** **ALWAYS** include a title! Make your title short and specific. Ideally, titles should be 5 or 6 words long, never more than 10.

**Length:** Make papers as concise as possible; 8 to 12 pages should be reasonable for an undergraduate research paper, while 15 to 20 pages would be more common for a graduate research paper. Note that your professor may prescribe a different length expectation and in some cases they may be quite a bit shorter. Please count only pages containing body text; figures, tables, the abstract, references and bibliography do not toward the page total.

**Headings:** Please try to use only one level or at most two levels of heading.

**Running Head:** Despite what it might appear to say in the APA guidelines, it is NOT necessary to place the words “Running Head:” in page headers; just put the abbreviated title of your paper in all uppercase letters (“all caps”) in the header of each page.

**Figures and Tables:** Please submit copies of any figures and tables on separate pages. They should have captions that are interesting, that are written in complete sentences, and that fully explain and interpret the exhibit without forcing the reader to refer to the text. Conversely, the reader should not have to refer back and forth from the text to the figures to understand the paper. You should refer to figures where appropriate with “(Figure 1),” but you should explain the meaning and implications of your data fully in the text. Do not require the reader to interpret the figure to understand what you have done, as in “Figure 1 shows the outcome of this survey.” Tables should list information in some obvious logical order.

**References:** Cite references in the body of the text: “Shrimp (1998) quibbled that ...” or if 1998 was a prolific year for Shrimp, “(May 1998).” If the author is not cited in the body of the text, then use the form (Shrimp 1998) for your citations. Include **all references cited** in a bibliography which according to APA standards should be titled “References”. Alphabetize your references by the name of the first author or the first word of the reference. Entries may be single-spaced but each entry should be separated from the next by a blank line. Ensure all quotes and **paraphrases** are properly cited in the body of your paper, and ensure all sources cited are included in your reference list.

For article references use the form

**Smith, James Q. (1978) Title of article. Title of Journal or Periodical, 10(5) [Volume(issue)] 45-50 [page numbers].**

and for book references,

**Toklas, Alice B. (1947) Book title. Publisher’s name, City, State (or Country).**

and for references that are collections of papers,

**Beedle, Albert A. (1979) Title of chapter. J.J. Fox, ed. Book title. Publisher’s name, City, State (or Country), 556-572 [page #s].**

and for references that are online,


- Note that APA style requires indentation of the second and subsequent lines of references, so each reference is **outdented**.
- Book and periodical titles must be italicized, and only the first word of a book title should be capitalized unless subsequent words would otherwise be capitalized (i.e. proper nouns, etc.)
- If there is no author given, cite the title, or if is published by a government agency, association, or corporation, cite the name of the agency, association, or corporate entity. You may use a short form in in-text citations, i.e. ABA for American Bar Association.
- If the reference is online, include the URL (web address) of the web page. **If the page is likely to change over time**, add a retrieval date.
If a reference includes a DOI (Digital Object Identifier), always include the DOI in your reference—even if it is a book or journal. In-text citations are essential in a research paper as they provide the evidence and findings of fact to support your thesis statement. A research paper without a significant number of citations throughout the paper is just an essay, and essay is a form rarely used in the disciplines taught in our department. Generally a research paper without in-text citations will lose one and possibly two letter grades.

Footnotes: Avoid footnotes. If what they contain is important, put in your text. If not, don’t distract the reader from what is important.

Writing Papers: The following steps suggests an effective way of organizing a paper (it’s just a suggestion):

1. Describe the problem;
2. Discuss previous work in the field and any necessary background information;
3. Explain what you did, how you did it, and what obstacles you encountered; or provide specific findings of fact and evidence in other research that support your proposed solution or thesis;
4. State your solution or conclusion;
5. List the resulting benefits, both quantitative and qualitative; and
6. If applicable, provide an appendix giving particulars of any models used or data collected during the research.

In writing your paper, explain your work so readers outside the field can understand it. If you must use a specialized term, abbreviation, or acronym, make sure you define it; write out an acronym or abbreviation the first time it appears and enclose it in parentheses immediately afterwards. Never assume your reader “already knows” the acronym or abbreviation!

Here is a possible step-by-step breakdown:

- Choose an area of interest to you to start your topic selection;
- Search for publications—both in print and online—related to your topic;
- Narrow your topic to refine your search results;
- Formulate a thesis statement to guide your research;
- A good thesis statement is critical; it’s the answer to the question that your paper explores and clearly delineates the argument that will be presented in your paper (see the humorous but accurate explanation to the right →→→)
- Scan books to see if they are relevant;
- Use the Table of Contents & index to quickly locate useful information;
- The table of contents for many books is now available online at the publisher or on amazon.com;
- If you find a book you need at Barnes & Nobles or on amazon.com, go to our library and odds are that if they don’t have it that they can get it on interlibrary loan;
- Make notes on, or photocopy, interesting passages as you encounter them;
- Make notes as you read to capture thoughts, questions, and ideas;
- Refine your research question and do further information gathering;
- Compose and write down your working thesis;
- Review and reflect on work done in the field already; discuss any necessary background information;
- Construct your argument, with the main points organized in an outline;
- Write a rough draft, expanding the outline to fulfill paper length requirements;
- Include quotes—with citations—that support your points;
- Revise your rough draft to ensure a strong, logical argument;
- Document all works referenced in the preparation of your paper and use necessary and appropriate in-text citations;
- Revise your paper for spelling, punctuation and grammar errors;
- Print out the final revision of your paper and bibliography or save as PDF or RTF file as necessary.

The Thesis Statement: A thesis statement is a sentence or a group of sentences that summarizes the main idea of a piece of writing, such as an essay, research paper, or thesis. Ideally, if well crafted, it should be a single sentence. It presents the central argument or claim that the writer is making, and it serves as a roadmap for the rest of the content. The thesis statement usually appears at the end of the introduction and provides a clear and concise statement of the writer’s position on a particular topic.

A strong thesis statement should be specific and arguable. This means it should not be a simple statement of fact that everyone would agree with. Instead, it should present a viewpoint or stance that can be supported with evidence and reasoning. The thesis statement should also be concise and to the point, providing the reader with a clear understanding of what the writer will be discussing in the following pages. It should never be self-referential, i.e. there is never a need to say “This paper will...” That is implicit and unnecessary, and it distracts from the impact of a well-crafted thesis statement. In essence, the thesis statement acts as a guide for both the writer and the reader, as it sets the tone for the writing and provides a framework for understanding the content that follows.
The Outline: An outline is a systematic and hierarchical arrangement of ideas and information that is used as a guide for writing or organizing content. It breaks down larger, complex topics into smaller, manageable sections and provides a clear structure for the final product. An outline can be used for a variety of content types, including essays, speeches, research papers, books, and more. An outline can help the writer stay focused, ensure that all important points are covered, and provide a clear organization for the final product. Typically, an outline follows a hierarchical format, with main ideas represented as Roman numerals (I, II, III, etc.), supporting ideas as capital letters (A, B, C, etc.), and details as Arabic numerals (1, 2, 3, etc.). Each level of the outline provides more detail and specificity, leading up to the final product. The ideas are expressed as bullet points and normally don't need to be full sentences—and never paragraphs.

Use of Wikipedia: While Wikipedia is a good starting point for research to get an overview and point you to available resources, you cannot cite or quote Wikipedia in an assignment in Illinois Tech’s Information Technology & Management curriculum. Wikipedia is a wonderful resource, but due to its community-edited nature it is not acceptable as a source of material for use in academic writing. Verify the information from Wikipedia through an independent reference. Quality Wikipedia articles will always provide good references; use them.

Live, In-Person Help:

- The IIT Writing Center (https://www.iit.edu/humanities/student-resources/writing-center) exists only to HELP YOU WRITE YOUR PAPER. Typically, you will take a project or paper assignment to the center, where a tutor will work one-on-one with you to assist with the writing process. There are tutors there who are especially trained to work with students for whom English is a second language but they certainly will work with anyone. The Writing Center is in Siegel Hall rooms 232 and 233. Students may use sign-up sheets on the doors of SH 232 and 233 to reserve a specific time with a tutor. When possible, the Writing Center also accepts students on a walk-in basis without an appointment. Online appointments may be made on the Writing Center webpage.

- Illinois Tech’s Galvin Library has Reference Librarians who are there specifically to assist you in your research and preparation of citations. If you have specific questions about preparation of of your references, they are the experts and they are there to help. They also offer classes to help you learn how to best use library resources. You can also make a research appointment to receive specialized help with your research at https://iit.libcal.com/appointments. More information can be found in the library guides page at https://guides.library.iit.edu/; resources to assist you in research and citations can be found at https://guides.library.iit.edu/researchtools and https://guides.library.iit.edu/general-info. A good general guide to using library resources can be found at https://guides.library.iit.edu/internationalstudents. Reference sources for information technology are at https://guides.library.iit.edu/informationtechnology. The Reference Librarian for specific information technology and management queries is Charles Uth, uth@iit.edu / (312) 567-5319

Fundamentals for International Students is a library workshop/tour to help you get familiar with the library building and services, and is usually scheduled during the orientation week or the first two weeks of classes. Tour dates are announced on the library websites and IIT Today. The International Student Library guide is at https://guides.library.iit.edu/internationalstudents.

Additional Information:

- For a fine discussion of writing, read William Strunk Jr. & E.B. White’s The Elements of Style, Allyn & Bacon, Needham Heights, MA.
- For definitive guidance for preparation of a research paper in APA style, see the American Psychological Association’s Publication Manual of the American Psychological Association, American Psychological Association, Washington D.C.
- For a more complete, formal treatment of the process of preparing a paper for publication, see The University of Chicago Press The Chicago Manual of Style, University of Chicago Press, Chicago, IL.
- For sound advice on figures, refer to the series of books by Edward R. Tufte: The Visual Display of Quantitative Information, Envisioning Information, Visual Explanations, and Beautiful Evidence, all from Graphics Press, Cheshire, CT.

Other very useful resources for preparing papers:

- OWL at Purdue: The Online Writing Lab at Purdue University: https://owl.purdue.edu/owl/purdue_owl.html
- The IIT Writing Center: https://www.iit.edu/humanities/student-resources/writing-center
- 50 Ways to Increase Your Chances for an “A” Research Paper (also archived but still valuable; we have the author's permission to update and republish this but we have to get Rasmussen University’s): https://web.archive.org/web/20180507084831/http://www.rasmussen.edu/student-life/blogs/main/research-paper-strategies/
- Writing Guides, Indiana University: https://wts.indiana.edu/writing-guides/index.html
- APA Style: http://www.apastyle.org/
- APA Style official APA Handouts and Guides on APA citation styles and bibliography entries: https://apastyle.apa.org/instructional-aids/handouts-guides
- See especially: 
  - In-Text Citation Checklist https://apastyle.apa.org/instructional-aids/in-text-citation-checklist.pdf

- **Citing Sources and Bibliographic Styles:** This site provides information about citing sources, plagiarism and three bibliographic styles approved by the Illinois Tech Graduate College: APA style Guide, MLA Style Guide, and Chicago-Turabian Style Guide. https://guides.lib.berkeley.edu/publichealth/style. A similar resource covering the same set of styles plus IEEE is https://pitt.libguides.com/citationhelp (All work submitted for ITM should be in APA style unless specified otherwise by your instructor.)

- **Easybib.com** is an online resource with an accurate automatic bibliography and citation maker for APA, MLA, and Chicago style formats. https://www.easybib.com/

- **Zotero** bibliographic software as a free standalone program for Windows, Mac or Linux with connecting extensions available for Chrome/Edge, Firefox, and Safari: http://www.zotero.org/

**Submission of Research for Academic Publication:** A key to submission of research for academic conference or journal publication is to ensure that they are correctly formatted for submission. Each conference or journal will have their own format; here are some of the most frequently used.

- **ACM Journals, Proceedings, and Conferences:** The current ACM publications submission template for Microsoft Word is at http://www.itm.iit.edu/data/ACM_submission_template.docx. Use this to format all ACM paper submissions. If a paper does not perfectly match this template, it may be rejected. If a paper is accepted, a new template will be applied before final submission; full instructions for submissions and the additional templates are at https://www.acm.org/publications/authors/submissions.

- **IEEE publication submission templates:**
  - **IEEE Transactions template** for Microsoft Word: http://www.itm.iit.edu/data/IEEE-Transactions-template-and-instructions-on-how-to-create-your-article.doc, while specific instructions for use of these templates is at http://www.itm.iit.edu/data/IEEE-Transactions-instructions-only.pdf.
  - There are a variety of templates for IEEE publications and you can ensure that you select the correct one using resources at https://journals.ieeeauthorcenter.ieee.org/create-your-ieee-journal-article/authoring-tools-and-templates/tools-for-ieee-authors/ieee-article-templates/.

- **Other Resources:** For a very nominal cost you can use a commercial service, SciSpace, to format your paper for submission for publication at https://typeset.io/. If it’s just one paper, you may even be able to use their free trial option. They also offer 40,000 Journal templates to format your paper for publication in journals and conferences published by IEEE, ACM, Elsevier, Spring, Wiley, and many more.

**Thesis Submission for Master of Science Students**

To be successful in the pursuit of their degree, graduate students submitting a thesis must read and be very familiar with all of the references cited below. A mandatory thesis preparation discussion is held at the beginning of every semester to assist graduate students with the preparation of their theses. The exact date and time is emailed to all graduation applicants by the Office of Graduate Academic Affairs. (http://bulletin.iit.edu/graduate/academic-policies-procedures/thesis/)

- **Thesis Examination:** Details for preparation and submission of your Illinois Tech thesis as well as the thesis examination process are on the Thesis Examination page at https://web.iit.edu/gaa/thesis. Every thesis-option Master of Science student should become very familiar with all of the content on this page.


- **Required Forms:**
  - **Masters Thesis, Project Review, or Exam Scheduling** (Form G300) Students must arrange their committee with their academic adviser by the end of the third week of classes and the G300 Form with committee member names and the examination date must be submitted to the Graduate Office of Academic Affairs (GAA) no later than two weeks prior to the exam date. The Masters Comprehensive/Ph.D. Qualifying Exam Results form (Form G303) will be sent to the Department for completion as a result of submission of form G300, but the G303 form is never available to students.
  - **Final Thesis Approval** (Form G501) This form is due at least nine days before the end of the semester, during the Fall and Spring terms, and five days before the end of the semester, for Session B Summer term.
departmental policies for student research and research adviser assignments should be directed to Professor

Scheduled each term. Students will register for ITMT 59

Omar

their research areas of interest. The research adviser will normally also be the

The beginning of the semester prior to their final semester

Master of Science students electing to do a project should be meeting with their research adviser to discuss the project

Questions about departmental policies for student research and research adviser assignments should be directed to Professor Gurram Gopal, Associate Chair for Graduate Programs and Research, 312.567.3651 / Perlstein 221C / gopal@iit.edu.

Research Faculty areas of interest:

✔ Associate Professor Calvin Nobles: Cybersecurity, human factors, business and management, governance
✔ Associate Professor Marwan Omar: Cybersecurity, Machine Learning in Cybersecurity, digital forensics, Natural Language Processing Robustness, Virtualization, Cloud Computing security
✔ Assistant Professor Maurice Dawson: Cybersecurity, Internet of Things, software assurance
✔ Assistant Professor Ann Rangarajan: Individual, organizational, societal, and cultural factors underlying complex socio-technical systems that impact technology management and applied computer science, as well as computer systems engineering, information systems (IS) innovation and diffusion, and socio-technical factors impacting technology implementations.

✔ Assistant Professor Yong Zheng: Recommender systems, artificial intelligence, behavior analytics, data mining and machine learning, Natural Language Processing, data management.

Thesis Examiner Appointment: An initial thesis appointment with the Thesis Examiner must occur no later than six weeks before the end of the term in which the thesis will be defended, but may occur earlier. At this meeting students will be expected to share with the Examiner preliminary pages; at least one chapter that has tables and/or figures, if applicable; the appendix, if applicable; and the bibliography.

Thesis Committee: The Thesis Committee must have at least two members who must be drawn from Professors Nobles, Omar, Dawson, and Zhang; students may elect to have a third committee member who is a tenured or tenure track faculty member from outside the department, or an outside member who may be a teaching faculty member in the department.

Thesis Defense: Students must defend their thesis in an oral presentation before their Thesis Committee which shall constitute the comprehensive examination for their degree. At least two weeks prior to the thesis defense, the completed thesis must be distributed to each committee member for review and comment. The thesis must be defended and then approved by the Thesis Committee and must be submitted no later than fifteen days before the end of the term (Master’s Thesis Examination, http://bulletin.iit.edu/graduate/academic-policies-procedures/examinations/). The graduate student must be registered in the semester in which the thesis is defended.

Project Submission for Master of Science Students
Master of Science students electing to do a project should be meeting with their research adviser to discuss the project no later than the beginning of the semester prior to their final semester of studies. Each student will be assigned a research adviser based on their research areas of interest. The research adviser will normally also be the project adviser and must be a tenured or tenure-track member of the faculty. In the Department of Information Technology and Management this currently includes Professors Nobles, Omar, Dawson, Ranarajan, and Zhang. Each faculty member eligible to serve as a project adviser will have an ITMT 591 section scheduled each term. Students will register for ITMT 591 for terms in which they will conduct thesis research. Questions about departmental policies for student research and research adviser assignments should be directed to Professor Gurram Gopal, Associate Chair for Graduate Programs and Research, 312.567.3651 / Perlstein 221C / gopal@iit.edu.
Research Faculty areas of interest:
- Associate Professor Calvin Nobles: Cybersecurity, human factors, business and management, governance
- Associate Professor Marwan Omar: Cybersecurity, Machine Learning in Cybersecurity, digital forensics, Natural Language Processing Robustness, Virtualization, Cloud Computing security
- Assistant Professor Maurice Dawson: Cybersecurity, Internet of Things, software assurance
- Assistant Professor Ann Rangarajan: Individual, organizational, societal, and cultural factors underlying complex socio-technical systems that impact technology management and applied computer science, as well as computer systems engineering, information systems (IS) innovation and diffusion, and socio-technical factors impacting technology implementations.
- Assistant Professor Yong Zheng: Recommender systems, artificial intelligence, behavior analytics, data mining and machine learning, Natural Language Processing, data management.

Project Examination Committee: The Project Examination Committee must have at least two members who must be drawn from Professors Nobles, Omar, Dawson, Rangarajan, and Zhang; students may elect to have a third committee member who is a tenured or tenure track faculty member from outside the department, or an outside member who may be a teaching faculty member in the department.

Project Submission: Students must submit documentation of their project and demonstrate and describe their project in an oral presentation before their Project Examination Committee which shall constitute the comprehensive examination for their degree. Documentation submitted for a Master’s project must include a paper suitable for academic publication as, at minimum, a conference poster session. (Details of submission of research for academic publication is described above.) The project must be presented and approved by the Committee and submitted no later than fifteen days before the end of the term (Comprehensive Examination, http://bulletin.iit.edu/graduate/academic-policies-procedures/examinations/.) The graduate student must be registered in the semester in which the project is submitted.

Required Forms:
- Masters Thesis, Project Review, or Exam Scheduling (Form G300) Students must arrange their committee with their academic adviser by the end of the third week of classes and the G300 Form with committee member names and the examination date must be submitted to the Graduate Office of Academic Affairs (GAA) no later than two weeks prior to the exam date. The Masters Comprehensive/Ph.D. Qualifying Exam Results form (Form G303) will be sent to the Department for completion as a result of submission of form G300, but the G303 form is never available to students.