PREPARING YOUR ECE SENIOR THESIS

By

ECE 499 Staff

Department of Electrical and Computer Engineering

University of Illinois at Urbana-Champaign

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Abstract

This document offers guidance on the preparation of senior theses in the Electrical Engineering and Computer Engineering programs. The document was generated from the Microsoft Word template, "ECE 499 template.dotx," which can be downloaded from the ECE 499 wiki. Format and style requirements are outlined, and advice on writing and use of the template is given.

Note to LaTeX users: LaTeX style files and documentation for graduate theses are available at https://wiki.engr.illinois.edu/display/ECEThesisReview/ . The graduate thesis title page will require manual adjustment for an undergraduate thesis; otherwise, the output of the graduate style files is acceptable for undergraduate theses. A LaTeX-generated document will have a very different appearance from a Word document generated from "ECE 499 template.dotx," but it should still meet all the requirements spelled out here.

Subject Keywords: ECE 499; Senior Thesis; technical writing; scientific writing

Contents

1. Introduction

1.1 Purpose

Senior Thesis is written in ECE 499 to document the rationale, methodology, and results of the Senior Research Project conducted under ECE 496.

Write the thesis to an imagined audience of engineers and scientists who are knowledgeable in your field.

1.2 Draft Review and Grading

The thesis will be checked for language and format by the ECE Publications Office staff who review ECE M.S. and Ph.D. theses, and for technical adequacy by your instructor (thesis advisor).

The draft thesis should be submitted in hard copy (single-sided, white, no stapling) to the Publications Office for review no later than 10 days before Reading Day. In addition, email a PDF file to Editor Jamie Hutchinson at jhutchin@illinois.edu. The thoroughness of the Publications Office review will be based on time available, so responsibility for correct formatting, as well as good style and grammar, rests ultimately with the student and the advisor. The final revised copy of the thesis should be presented to the thesis advisor during Finals Week. The grade for ECE 496/499 will not be recorded until the ECE Advising Office receives a final, corrected version of the thesis along with the completed and graded thesis checklist signed by the advisor.

1.3 Final Deposit in IDEALS

Final PDF of the thesis will be deposited (by ECE staff) in the Illinois Digital Environment for Access to Learning and Scholarship (IDEALS, www.ideals.illinois.edu), where researchers worldwide will be able to find your title and abstract through a keyword or author search. However, *access to the PDF file will be restricted to University of Illinois users only*, except in the case of outstanding work recommended for global access by the faculty advisor. To expedite the deposit process for ECE staff, please name your PDF file according to the scheme in Figure 1.

Figure 1. Naming scheme for final PDF of thesis.

1.4 Summary

This guide describes all the components of a successful senior thesis. Chapter 2 introduces the most standard outline for your subject matter, although you and your advisor may decide to organize the work differently. Chapter 3 introduces the template "ECE 499 template.dotx" and its use in achieving good thesis format. Chapter 4 addresses the main points of good technical style for writing, and Chapter 5 covers the all-important topic of figures and tables. Chapter 6 offers final words of advice and points to further resources for authors. Appendices A and B contain, respectively, a guide to symbols and abbreviations, and a handy checklist.

2. Outline of Subject Matter

2.1 Abstract and Subject Keywords

The abstract is a concise (no more than 300 words) summary of the main findings of the research. Get right to the point. Imagine a researcher who encounters your abstract in a literature search: They need to know what you have found and whether the full thesis is relevant to their own work. Save discussion of background and motivations for the Introduction and Literature Review.

ECE staff will use your subject keywords to deposit the thesis in IDEALS (see Section 1.3). Confer with your advisor about the best keywords. Provide at least one, and separate multiple keywords by semicolons. You may want to refer to the IEEE taxonomy:

http://www.ieee.org/publications_standards/publications/authors/authors_journals.html

(Scroll down to the Taxonomy under "Preparing your article.") If your subject is more physics oriented, you may find the AIP Physics and Astronomy Classification Scheme to be a better resource:

http://www.aip.org/pacs/pacs2010/about.html

2.2 Introduction

The first chapter of the thesis immediately following the Table of Contents is the Introduction. In this chapter (starting on page 1) you briefly describe the science or engineering problem to be addressed in the thesis. The chapter concludes with brief descriptions (a few sentences) of the contents of the upcoming chapters and a summary of the main conclusions of the thesis research (elaborated in more detail in the final chapter).

2.3 Literature Review

The second chapter of the thesis should present a critical review of prior work published in the literature that is directly relevant to the problems addressed in the thesis. Explain what aspects of the previous approaches to the problem are to be superseded by the work described in the thesis. If your advisor does not require a traditional, thorough literature review, you should at least dedicate a chapter to summarizing the research context of, and motivation behind, your work.

2.4 Description of Research Results

The next set of chapters will describe the main body of research work undertaken in your study. One chapter can be dedicated to experimental techniques, or numerical techniques, or any other methodology applied to the research problem. The subsequent chapters should show the specifics of research work, including derivations, proofs, measurement results, etc., as appropriate. Use as many chapters as needed to present the thesis work in a logical and organized manner. These chapters will typically contain diagrams, data plots, mathematical equations, code snippets, etc., depending on the nature of the thesis.

Material that is important but may disrupt reading of the main text—such as lengthy code, data tables, schematics, certain proofs, and detailed discussion of laboratory equipment and processes—should be placed in an appendix.

2.5 Conclusion

This is the last chapter of the thesis. Bring together, concisely, the conclusions to be drawn from the results of the thesis study. Also discuss unresolved issues and make suggestions for future work. As much as possible, use words only, with few or no figures, tables, or equations.

3. Format

3.1 "ECE 499 template.dotx"

To create your thesis, use the template "ECE 499 template.dotx," from which the document you are reading now was created. Double-clicking the template opens an untitled Word document that you can save with any name you like. Replace the red text and bracketed section heads with your own, and adapt the structure to your needs. (Note that the line spacing in this document is narrow, but your thesis should be spaced at 1.5 or 2. Red text in the template is spaced at 1.5.)

3.2 Format Standards

You may change the styles for text, headings, figure captions, etc., in "ECE 499 template.dotx," as long as you output a document that meets the following standards:

- Preliminary pages are numbered with small roman, except title page, which has no page number. (To achieve this, "ECE 499 template.dotx" incorporates a section break after the preliminary pages, with "Different first page" checked in the Header and Footer tab for the preliminary pages, but not the main text.)
- Table of contents (TOC) is neat, accurate, and consistent in the depth (level of headings) represented for each chapter. Use the automatic TOC feature provided, and be sure to hit the Update tab!
- Chapter 1 starts on Arabic page number 1, and the rest of the thesis, including appendices, follows from that. (Do not use independent page numbering for appendices.)
- Each chapter starts on a new page. Line spacing for text is 1.5 or 2.
- Preliminary sections (abstract, contents) have chapter status graphically, but are not included in the TOC. ("ECE 499 template.dotx" achieves this by matching the font and color of chapter titles, but stripping out the Heading 1 style, which is "read" by the auto TOC generator.)
- Numbering of chapters and sections is logical. "ECE 499 template.dotx" will not automatically update numbers when sections and chapters are inserted and deleted, so keep track and proofread the thesis!
- References and Appendices have chapter status graphically and are included in the TOC, but they are not numbered as chapters.
- Margins are at least one inch on all sides. Watch margins when you insert figures, tables, and equations!

3.3 References

"ECE 499 template.dotx" provides IEEE "templates" for most kinds of sources you will need to cite. If you need to cite something for which there is no template, simply use common sense and provide—in a neat and orderly manner emulating the IEEE reference style—the information necessary for another researcher to find that source. If you have many references, you may want to use a software package such as OneNote or RefWorks to keep them organized. These packages (along with BibTeX for LaTeX) automatically update citations and numbering as you develop and revise the text.

Your advisor may prefer that you use a reference style other that IEEE; for instance, in remote sensing it is customary to use Radio Science (AGU) style, and researchers in microelectronics often use AIP. The software packages mentioned above will output any style. If you are doing it manually, consult the guides available on the ECE Thesis Check wiki at https://wiki.engr.illinois.edu/display/ECEThesisReview/. Reference style guides, as well as templates and software, are also available online at the various journal/society web sites.

Custom reference styles may be permitted if they meet scholarly standards and are consistently adhered to.

References [1]–[3] (in both the template and this document) are examples of a manual, datasheet, and web page, respectively. References [4]–[7] are more standard, scholarly sources: a book, chapter in an edited book, journal article, and conference proceedings. Reference [8] is a technical report, and reference [9] is class notes. Cite all references consecutively in the text, as is done here, unless your reference list is organized alphabetically.

4. Technical Style

Write in a formal style and neutral tone without letting your writing become dull and lifeless. Use active voice as much as possible, and employ variety in sentence structure. Avoid wordiness, affectation, awkwardness, and gobbledygook. Use past tense to report transitory results and completed actions (e.g., "The resistance was 10 Ω until we replaced R1"). Use present tense to report final results and discussion (e.g.: "The completed circuit operates at 2.5 kHz," "A simple explanation of these findings is that …"). Avoid frequent and arbitrary changes in verb tense.

4.1 Units of Measure

Express quantities with an Arabic number, followed by a space, followed by an IEEE-recommended abbreviation for the unit of measure (see Appendix A). IEEE takes its lead from the International System of Units, which provides a single, coherent measurement system for researchers worldwide. Examples:

0.2 pA, 127 µm, 0.574×10^{-3} mm^2, 10 kΩ, 120 A, $5500.00

Note that units of measure are *not* italicized. (The only exception is µ, which may be italicized; e.g., 127 μm.)

When discussing units without quantities, use words not symbols ("A millimeter-scale device").

4.2 Numbers

In general, use words for numbers up to 10 (e.g., one, two, three), and use numerals for numbers 10 and up. Exceptions:

- Always use a word at the beginning of a sentence: "Forty trials were run." (You may wish to recast as "We ran 40 trials.")
- Unless at the beginning of a sentence, quantities with units of measure are always numerals: 3 mm, 5 V.
- Numbers used as nouns are usually set as numerals: Chapter 3, sample 16, device 2.
- When comparing, within a paragraph, numbers that are above and below 10, make them all numerals: "In trials 1 and 2, we completed 8 and 15 runs, respectively."
- If two numbers that would normally be set as numerals appear next to each other, it may be best to change the lowest number to words: "We completed sixteen 45 min trials."
- In some cases it may be clearer to spell out zero and one than to use numerals 0 and 1.

4.3 Mathematics

Mathematical expressions that are referenced later in the text should be displayed (not in-line) and numbered according to the same system as, but in a sequence independent of, figures and tables. Displayed expressions should be centered (preferred) or indented, with numbers (if used) in parentheses flush right. Insert any punctuation after the equation, not the number. (Such terminal punctuation is not required, but if used it must be applied consistently. The easiest style is simply to have no punctuation after equations.) Text references to numbered equations should be capitalized, with parentheses preceded by a space: "Equation (2.1) shows ... ."

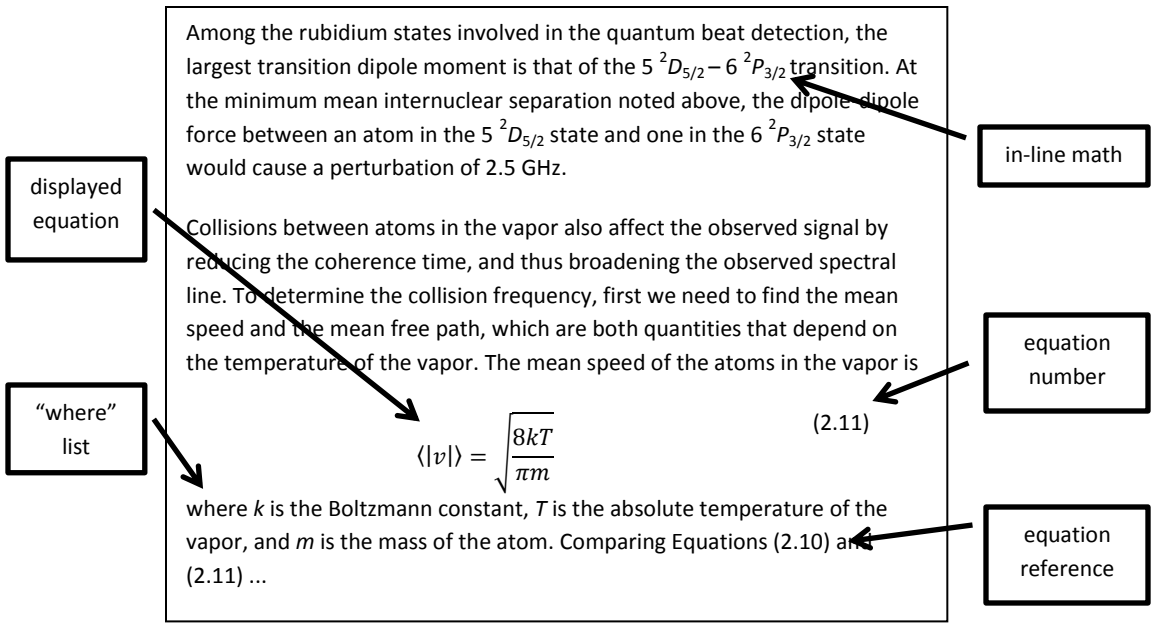

Figure 2. Well formatted passage of running text, in-line math, displayed equation with number, "where" list, and equation references.

A math symbol should be rendered with the same typography (e.g., font, italics, bold, upper/lower case) whether it occurs in display or in-line, and it should always denote the same thing. A sentence should not begin with a math symbol—especially a lower case one, and especially when the previous sentence ends with a math symbol.

Figure 2 depicts correctly formatted math. Use the MathType extension of Word if available; if not, use symbol fonts and pay close attention to italics (for variables) and bold (for vectors and matrices). Use tables (with no borders) to keep equations and their numbers aligned. For easier reading, very long "where" lists can be formatted as ordered lists (indented and aligned).

4.4 Abbreviations

Abbreviations should be defined the first time they appear in both the abstract and the main text. After that, only the abbreviation is necessary, though you may choose to repeat the definition for a new chapter or after an extended period of disuse of the abbreviation. Many standard abbreviations are given in Appendix A. References to figures and equations may be abbreviated using "Fig." and "Eq." as long as the abbreviations are used consistently. The exception is at beginnings of sentences, where words should always be spelled out: "Equation (3.2) gives the formula for ... ."

5. Figures and Tables

Figures and tables must be (1) neat and readable, (2) numbered with descriptive, concise captions (for figures) or titles (for tables), (3) cited directly in the text, and (4) well placed in relation to the textual discussion.

5.1 Quality

Figures should be readable within the one-inch required margins. Label axes using standard symbols for units of measure. Employ color and shading strategically to convey important distinctions, not for the sake of variety or show. Use the References➔Insert Caption tool to generate consistently formatted captions (always *below* the figure), and use the grouping function in Word's drawing tools to hold figure and caption together. Use picture formatting tools to hold figures in place (preferably at top or bottom of page) and to define text wraps ("top and bottom" is best).

Table titles should be short and appear *above* tables. Use Word's table design and layout tools to format titles, column heads, and borders. Align decimal points in columns so that quantities are meaningfully conveyed. Use the title and/or column heads to identify units of measure, rather than repeating them in every cell. Simplicity is best.

5.2 Numbering, Citation, and Placement

Number figures, tables, and displayed equations in *independent* sequences according to one of two systems: whole number (1, 2, 3 …) or single-decimal (1.1, 1.2 … 2.1, 2.2, etc., where the number to the left of the decimal corresponds to the chapter number). Use the same system for all three, but do not integrate them in one sequence. Do not create a multiple-decimal numbering system!

In the text, cite every figure and table *directly* (e.g., "Figure 1 shows …" not "the following figure shows …"). Citing (and numbering) equations is optional.

Pick one of three placement schemes for figures and tables and stick with it throughout the thesis:

1. Place figure or table on the page where it is first cited in text (preferably at top or bottom of page), or on the first possible page after it is cited in text (which may be some pages later if several figures are cited in a short passage).
2. Place figures and tables in a separate section at the end of the chapter.
3. Place figures and tables in a separate chapter after the conclusion and before the references.

Schemes 2 and 3 require a numbered section or chapter entitled "Figures and Tables" with a table of contents entry. When you cite the first figure or table in the text, notify the reader with a comment such as "All figures and tables are in Section X.X" or "All figures and tables are in Chapter X." Figure 3 and Table 1 provide examples of scheme 1.

Do not reserve an appendix for figures and tables, and do not create independent series of schematics, photographs, block diagrams, etc. *These are all figures*, part of one sequence of figures. If helpful, you may specify the kind of figure in the caption or textual discussion, but it is usually obvious.

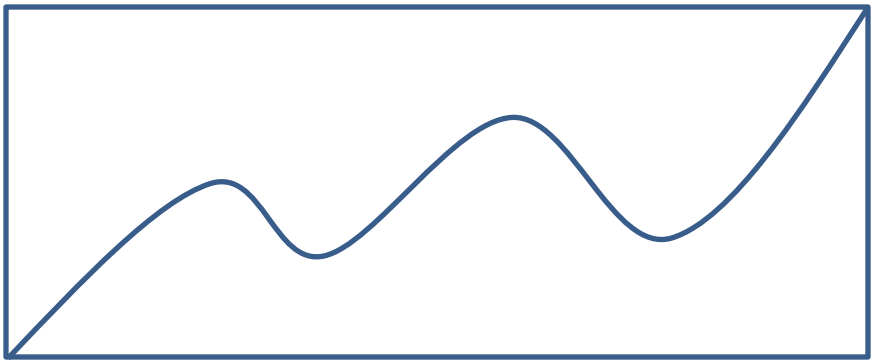

Figure 3. Figure placed according to scheme 1.

Table 1. Table placed according to scheme 1

	Electricity	**Magnetism**
Field intensity	**E**	**H**
Flux density	**D**	**B**
Constitutive factor	**ε**[b]	**μ**[c]

You may place figures and tables according to scheme 2 or 3 in the main text while using scheme 1 in an appendix; otherwise, however, *do not mix* the three placement schemes outlined above.

Do not scatter figures among short passages of text as if narrating a slide show. Rather, write in unified, coherent, complete paragraphs, and try to hold blocks of text together on the page. This is why top or bottom of the page is best for figure and table location.

Large figures and tables may be rotated 90 degrees counterclockwise along with the caption, but keep the page number at the bottom in "portrait" orientation. Multipage figures and tables should have a caption or title such as "Figure 1 (continued)" on every page after the first. However, never split a figure or table across a page break when it will fit in one page; for example, do not start a short table at the bottom of one page and continue it on the next.

6. Conclusion and Further Resources

Unfortunately, “ECE 499 template.dotx” will not guarantee a well-organized and formatted thesis. It certainly will not guarantee a well written one. The best way to ensure success is to start early, communicate regularly with your advisor and lab mates, seek help when you get stuck, and revise, revise, revise! Use the checklist provided in Appendix B.

You can get help with the writing process, including questions of style, grammar, and organization, through the Writer’s Workshop with locations across campus including Grainger Library. See the web site at www.cws.illinois.edu/workshop/ . (The link “Writer Resources” is extremely helpful, with a grammar handbook, ESL resources, and writing tips.)

Strunk and White [10] bears reading about once per year for anyone who must write effectively in his or her career. Williams [11] is more lengthy but very worthwhile. For technical writing in particular, Alley [12] remains a fresh, highly readable introduction, while Alred et al. [13] provide an exhaustive overview that is useful as a reference tool.

References

[1] *Motorola Semiconductor Data Manual,* Motorola Semiconductor Products, Inc., Phoenix, AZ, 2007.

[2] *Double Data Rate (DDR) SDRAM,* datasheet, Micron Technology, Inc., 2000. Available at: http://download.micron.com/pdf/datasheets/dram/ddr/512MBDDRx4x8x16.pdf

[3] Linx Technologies LT Series, web page. Available at: http://www.linxtechnologies.com/products/rf-modules/lt-series-transceiver-modules/. Accessed January 2012.

[4] J. A. Prufrock, *Lasers and Their Applications in Surface Science and Technology,* 2nd ed. New York, NY: McGraw-Hill, 2009.

[5] W. P. Mondragon, "Principles of coherent light sources: Coherent lasers and pulsed lasers," in *Lasers and Their Applications in Surface Science and Technology,* 2nd ed., J. A. Prufrock, Ed. New York, NY: McGraw-Hill, 2009, pp. 117-132.

[6] G. Liu, "TDM and TWDM de Bruijn nets and shufflenets for optical communications," *IEEE Transactions on Computers*, vol. 59, no. 1, pp. 695-701, June 2011.

[7] S. Al Kuran, "The prospects for GaAs MESFET technology in dc–ac voltage conversion," in *Proceedings of the Fourteenth Annual Portable Design Conference*, 2010, pp. 137-142.

[8] K. E. Elliott and C. M. Greene, "A local adaptive protocol," Argonne National Laboratory, Argonne, IL, Tech. Rep. 916-1010-BB, 2006.

[9] J. Groeppelhaus, "Java 5.7 tutorial: Design of a full adder," class notes for ECE 290, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, 2011.

[10] W. Strunk Jr. and E. B. White, *The Elements of Style,* 4th ed. Needham Heights, MA: Allyn & Bacon, 2000.

[11] J. M. Williams, *Style: Lessons in Clarity and Grace*, 9th ed. New York, NY: Pearson Education, 2007.

[12] M. Alley, *The Craft of Scientific Writing*, 3rd ed. New York, NY: Springer, 1996.

[13] G. J. Alred, C. T. Brusaw, and W. E. Oliu, *Handbook of Technical Writing*, 8th ed. New York, NY: St. Martin's Press, 2006.

Appendix A Recommended Abbreviations

Unit or Term	Symbol or Abbreviation
alternating current	ac
American wire gauge	AWG
ampere	A
ampere-hour	Ah
amplitude modulation	AM
angstrom	Å
antilogarithm	antilog
atomic mass unit (unified)	u
audio frequency	AF
automatic frequency control	AFC
automatic gain control	AGC
automatic volume control	AVC
average	avg
backward-wave oscillator	BWO
bar	bar
barn	b
beat-frequency oscillator	BFO
bel	B
billion electronvolts*	BeV
binary coded decimal	BCD
bit	b
British thermal unit	Btu
byte	B
calorie	cal
candela	cd
candela per square foot	cd/ft^2
candela per square meter	cd/m^2
cathode-ray oscilloscope	CRO
cathode-ray tube	CRT
centimeter	cm
centimeter-gram-second	CGS
circular mil	cmil
continuous wave	CW
coulomb	C
cubic centimeter	cm^3
cubic foot per minute	ft^3/min
cubic meter	m^3
cubic meter per second	m^3/s
curie	Ci
cycle per second	Hz
decibel	dB
decibel referred to one milliwatt	dBm
degree Celsius	°C
degree Fahrenheit	°F
degree Kelvin**	K
degree (plane angle)	...°
degree Rankine	°R
degree (temperature interval or difference)	deg
diameter	diam
direct current	dc
double sideband	DSB
dyne	dyn
electrocardiograph	EKG
electroencephalograph	EEG
electromagnetic compatibility	EMC
electromagnetic unit	EMU
electromotive force	EMF
electronvolt	eV
electrostatic unit	ESU
erg	erg
extra-high voltage	EHV
extremely high frequency	EHF
extremely low frequency	ELF
farad	F
field-effect transistor	FET
foot	ft
footlambert	FL
foot per minute	ft/min
foot per second	ft/s
foot-poundal	ft-pdl
foot pound-force	ft•lbf
frequency modulation	FM
frequency-shift keying	FSK
gallon	gal
gallon per minute	gal/min
gauss	G
gigacycle per second	Gc/s
gigaelectronvolt	GeV
gigahertz	GHz
gilbert	Gb
gram	g
henry	H
hertz	Hz
high frequency	HF
high voltage	HV
horsepower	hp
hour	h
inch	in
inch per second	in/s
inductance-capacitance	LC
infrared	IR
inside diameter	ID
intermediate frequency	IF
joule	J
joule per degree	J/deg
joule per kelvin	J/K
kilobit per second	kb/s
kilobyte	kB
kilocycle per second	kHz/s
kiloelectronvolt	keV
kilogauss	kG
kilogram	kg
kilogram-force	kgf
kilohertz	kHz
kilohm	kΩ
kilojoule	kJ
kilometer	km
kilometer per hour	km/h
kilovar	kvar
kilovolt	kV
kilovoltampere	kVA
kilowatt	kW

*Deprecated: use gigaelectronvolt (GeV).

**Preferably called simply *kelvin.*

Unit or Term	Symbol or Abbreviation
kilowatthour	kWh
lambert	L
liter	l
liter per second	l/s
logarithm	log
logarithm, natural	ln
low frequency	LF
lumen	lm
lumen per square foot	lm/ft^2
lumen per square meter	lm/m^2
lumen per watt	lm/W
lumen-second	lm•s
lux	lx
magnetohydrodynamics	MHD
magnetomotive force	MMF
maxwell	Mx
medium frequency	MF
megacycle per second	MHz/s
megaelectronvolt	MeV
megahertz	MHz
megavolt	MV
megohm	MΩ
metal-oxide semiconductor	MOS
meter	m
microampere	μA
microfarad	μF
microgram	μg
microhenry	μH
micrometer	μm
micron†	μ
microsecond	μs
microsiemens	μS
microwatt	μW
mil	mil
mile per hour	mi/h
mile (statute)	mi
milliampere	mA
milligram	mg
millihenry	mH
milliliter	ml
millimeter	mm
millimeter of mercury, conventional	mmHg
millimicron‡	nm
millisecond	ms
millisiemens	mS
millivolt	mV
milliwatt	mW
minute (plane angle)	…'
minute (time)	min
nanoampere	nA
nanofarad	nF
nanometer	nm
nanosecond	ns
nanowatt	nW
nautical mile	nmi

†The name *micrometer* (µm) is preferred.
‡The name *nanometer* is preferred.

Unit or Term	Symbol or Abbreviation
neper	Np
newton	N
newton meter	N•m
newton per square meter	N/m^2
oersted	Oe
ohm	Ω
ounce (avoirdupois)	oz
outside diameter	OD
phase modulation	PM
picoampere	pA
picofarad	pF
picosecond	ps
picowatt	pW
pound	lb
poundal	pdl
pound-force	lbf
pound-force foot	lbf-ft
pound-force per square inch	lbf/in^2
pound per square inch§	psi
power factor	PF
private branch exchange	PBX
pulse-amplitude modulation	PAM
pulse code modulation	PCM
pulse count modulation	PCM
pulse duration modulation	PDM
pulse position modulation	PPM
pulse repetition frequency	PRF
pulse-repetition rate	PRR
pulse-time modulation	PTM
pulse-width modulation	PWM
radian	rad
radio frequency	RF
radio-frequency interference	RFI
resistance-capacitance	RC
resistance-inductance-capacitance	RLC
revolution per minute	r/min
revolution per second	r/s
roentgen	R
root-mean-square	rms
second (plane angle)	…"
second (time)	s
short wave	SW
siemens	S
signal-to-noise ratio	SNR
silicon controlled rectifier	SCR
single sideband	SSB
square foot	ft^2
square inch	in^2
square meter	m^2
square yard	yd^2
standing-wave ratio	SWR
steradian	sr
superhigh frequency	SHF
television	TV
television interference	TVI

§Although the use of the abbreviation psi is common, it is not recommended. See pound-force per square inch.

Unit or Term	Symbol or Abbreviation
tesla	T
thin-film transistor	TFT
transverse electric	TE
transverse electromagnetic	TEM
transverse magnetic	TM
traveling-wave tube	TWT
ultrahigh frequency	UHF
ultraviolet	UV
vacuum-tube voltmeter	VTVM
var	var
variable-frequency oscillator	VFO
very-high frequency	VHF
very-low frequency	VLF

Unit or Term	Symbol or Abbreviation
vestigial sideband	VSB
volt	V
voltage controlled oscillator	VCO
voltage standing-wave ratio	VSWR
voltampere	VA
volume unit	vu
watt	W
watthour	Wh
watt per steradian	W/sr
watt per steradian square meter	$W/(sr \bullet m^2)$
weber	Wb
yard	yd

Appendix B Checklist for ECE Senior Thesis Authors

Note: "Automatic" features should still be checked!

Pagination and margins

_____ Title page unnumbered (counts as i)

_____ Preliminary pages in lower case roman numerals

_____ Chapter 1 starts on Arabic p. 1; pages numbered consecutively after that; line spacing is 1.5 or 2

_____ Minimum one-inch margin on all sides of every page (page number falls slightly outside, which is OK)

Abstract and subject keywords

_____ On page ii

_____ Title same style as chapter titles, but unnumbered

_____ Presents main findings concisely and that is all

_____ Good keywords chosen in consultation with advisor and with reference to standard taxonomy

Table of contents

Format

_____ Preliminary material (abstract, acknowledgments) *not* included

_____ Consistent capitalization

_____ Leader dots appear and page numbers aligned (automatic)

Agreement with text

_____ Wording of chapter titles and subheadings matches text exactly (automatic)

_____ Page numbers correct (automatic)

_____ Hit the Update tab!

Figures

Placement

_____ Same page as first citation in text or first possible page after that

or

_____ Separate section (with tables) at end of each chapter

or

_____ Separate chapter (with tables) after Conclusion

_____ **Not** scattered among short passages of text

Figures (continued)

Numbering and citations

_____ Every figure cited directly in text (e.g., “Figure 1 shows …”)

_____ Figures numbered in order of their citation in text

Quality

_____ Information conveyed economically

_____ Neat, legible, and within margins

_____ Axes labeled

Captions

_____ Every figure has descriptive caption (not just “Figure 1”)

_____ Caption below figure, use “Figure X (continued)” for multipage figures

Tables

Placement

_____ Same page as first cited in text or first possible page after that

or

_____ Separate section (with figures) at end of each chapter

or

_____ Separate chapter (with figures) after Conclusion

Numbering and citations

_____ Every table cited directly in text (e.g., “Table 1 shows …”)

_____ Tables numbered in order of their citation in text

Quality

_____ Neat and legible

_____ Decimals aligned

_____ Column and row headers labeled, with unit symbols, if necessary

Titles

_____ All tables have descriptive title (not just “Table 1”)

_____ Title *above* table, use “Table X (continued)” for multipage figures

Equations

_____ Neat and legible, with proper use of italics and bold

_____ Centered or indented consistently

_____ Numbered in sequence and according to same scheme (whole number or single-decimal) as figures and tables, but in a sequence independent of figures and tables

_____ Use of parentheses both in display and in text citation

_____ Numbers are flush right

Appendices

_____ Appear before References *if* they contain reference citations

_____ Figures and tables numbered, with captions/titles, and cited in the text

References

_____ All references cited in the text, and every citation corresponds to an entry in References

_____ Numbered in order of citation in text, OR list is alpha order

_____ Use of brackets and other IEEE style

_____ Use the template, and proofread!

Writing and style

_____ Quantities expressed with number, space, and correct unit symbol

_____ Abbreviations defined at first use and used consistently afterward

_____ Writing is neutral in tone, formal in style, and consistent throughout the thesis

_____ Active voice used as much as possible

_____ Needless words omitted

_____ Every sentence clear and readable

_____ Read the paper aloud (you'll be surprised at what the eye can miss but the ear can catch)

_____ Ask a lab mate to read and comment

_____ Ask a friend who is unfamiliar with the subject matter to read and comment

_____ Run Microsoft Word spelling & grammar check (but keep your thinking cap on)