

GUIDELINES FOR PREPARING THE THESIS

Doctor of Philosophy (Ph. D.)
Master of Technology (M. Tech.)
Master of Pharmacy (M. Pharm.)



DR. APJ ABDUL KALAM TECHNICAL UNIVERSITY
(Formerly Uttar Pradesh Technical University)
LUCKNOW

March 14, 2019

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GUIDELINES FOR PREPARING THE THESIS

1. GENERAL

As enshrined in the Acts, Regulations and Ordinances of the Dr. APJ Abdul Kalam Technical University, Lucknow, the objectives of the research, in general, encompass the discovery of new facts or techniques or correlation of facts already known, through analytical or experimental approach or both, while demonstrating a quality potential as to make a definite contribution to the advancement of knowledge useful to the society and the scholar's ability to undertake sustained research in future. Accordingly, a thesis being a documented manifestation of the above objectives, shall report, in an organized and scholarly fashion, an account of the original research work of the scholar and present the findings in an appropriate manner with actual accomplishments of the work plainly stated and honestly appraised.

The purpose of this manual is to provide broad guidelines to the Ph.D./ M.Tech./ M.Pharm. candidates for the preparation of the thesis. It lists the general and specific requirements governing the thesis preparation including guidelines for structuring the contents. The candidates are advised to have thoroughly gone through the up-to-date Ph.D. or M.Tech Ordinances, and other relevant announcements brought out from time to time by the University. Further, for style, structure and presentation of a very special type of work specific to a particular field, the scholar may refer to additional style manuals or reference guides and to the published literature in their respective fields of study.

2. ARRANGEMENT OF THE CONTENTS OF THESIS

The sequence in which the thesis contents should be arranged and bound should be as follows:

1. Cover Page and Title Page
2. Declaration
3. Bonafide Certificate
4. Abstract
5. Acknowledgements
6. Table of Contents
7. List of Tables
8. List of Figures
9. List of Symbols, Abbreviations and Nomenclature
10. Chapters 1, 2...
11. References
12. Appendices
13. List of Publications (out of the candidate's present work)
14. Curriculum Vitae (of the candidate)

3. MANUSCRIPT PREPARATION

3.1. Page Dimensions, Margins and Quality

The page dimensions of the final copies of the thesis should be 290mm x 205mm. Standard A4 size (297mm x 210mm) paper may be used for preparing the copies. It should have the following page margins:

Top edge	:	25 mm,	Bottom edge	:	25 mm
Left side	:	35 mm,	Right side	:	25 mm.

The thesis should be prepared on good quality white paper preferably not lower than **80 gsm**.

Tables and figures should be prepared on good quality paper preferably not lower than 80 gsm. Tables and figures should conform to the margin specifications. Large size figures should be photographically or otherwise reduced to the appropriate size before insertion.

3.2. Cover Page/ Title Page

A specimen of the cover/title page is given in the Annexure I. It carries

- a. The **TITLE of the thesis** (Times New Roman, font size 20, bold, single line spacing, all character's uppercase except the symbols and numerals if used in the title of the thesis; centered within the specified margin of the page).

**TITLE OF THESIS TITLE OF THESIS TITLE
OF THESIS TITLE OF THESIS**

- b. The phrase (Times New Roman, font size 14, bold, each line in the Title/Sentence mode, single line spacing, centered within the specified margin of the page).

**A Thesis Submitted
in Partial Fulfillment of the Requirements
for the Degree of**

- c. The name of the degree (Times New Roman, font size 20, bold, the whole line in uppercase, centered within the specified margin of the page).

**DOCTOR OF PHILOSOPHY
or MASTER OF TECHNOLOGY
or MASTER OF PHARMACY**

Note: In case of M.Tech. and M. Pharm. (not applicable to Ph D degree), after a gap of 16-18 Times New Roman pts, it will be followed by

in
Field of Specialization

where

in (Times New Roman, font size 14, bold, both the characters lower case, centered within the specified margin of the page).

Field of Specialization (Times New Roman, font size 16, bold, in Title Mode, centered within the specified margin of the page).

d. by (Times New Roman, font size 14, bold, both the characters lower case, centered within the specified margin of the page).

by

e. NAME OF STUDENT (Times New Roman, font size 16, bold, full name as enrolled, all characters in Title mode case, centered within the specified margin of the page).

Name of Student

f. (Enrollment Number) (Times New Roman, font size 12, bold, all numerals within a pair of small parenthesis, underneath the name of candidate and centered within the specified margin of the page).

(Enrollment no. xxxxxxxxxx)

g. Phrase of supervision (Times New Roman, font size 12, bold, line in the Title mode, centered within the specified margin of the page).

Under the Supervision of

h. NAME(S) OF SUPERVISOR (Times New Roman, font size 14, bold, full name in title mode prefixed by Prof. or Dr. centered within the specified margin of the page, separated symmetrically in case of two supervisors, use the next line in case of three supervisors; brief one-line mention of the names of the institution of the supervisors).

Prof. Duryodhan Singh Chatterjee
Excellent Institute of Technology Hazaratganj Lucknow

i. University logo (size = **30 mm diameter**)

j. Phrase for the name of faculty (Times New Roman, 12/14 pts., bold, full name of the University faculty in title mode, centered within the specified margin of the page).

to the

Faculty of (Name of the Faculty)

For example,

Faculty of Applied Sciences

- k. Name of the University (Times New Roman, font size 16/14, bold, full name, all characters upper case/Title mode, centered within the specified margin of the page).

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- l. Month, Year ((Times New Roman, font size 14, bold, full name of the month in title mode, comma, 4-digit year in Arabic, all centered within the specified margin of the page).

March, 2019

3.3. Declaration and Bonafide Certificate of Supervision

The Declaration of Candidate of the thesis shall be in double line spacing using Times New Roman font size 12, as per the format shown in Annexure III. The heading **DECLARATION** Times New Roman font size 14 bold in the center should start about 70mm from the top of the page. The certificate shall carry the supervisor's signature in original.

The Bonafide Certificate of Supervision of the thesis by the supervisor(s) shall be in double line spacing using Times New Roman font size 12, as per the format shown in Annexure IV. The heading **CERTIFICATE** Times New Roman font size 14 bold in the center should start about 70mm from the top of the page.

The certificate shall carry the supervisor's signature in original and shall be followed by the supervisor's name, academic designation (not any other responsibilities of administrative nature), department and full address of the institution where the supervisor has guided research scholar.

In case of two supervisors, the details about the signature, names, etc. mentioned above shall be centered symmetrically within the specified margin of the page. In case of three supervisors, the details of the third supervisor will appear in the centre underneath the first two.

The place and date of signature (left justified) common for all the supervisors will appear below the signature(s) of the supervisor(s).

3.4. Abstract

Abstract should be an essay type of narration not exceeding four pages outlining the research problem, the methodology used, a summary of the findings, possible applications of the research, and suggestions/directions for future research. The abstract should not contain cross citations. It should be typed single line spacing, in Times New Roman with font size 12 within the specified margin of the page. It should begin with the heading as the title of the thesis in title mode centered (bold), the name of candidate (next line) centered, and then **'ABSTRACT'** with font size 14, bold and centered. The text of abstract should begin thereafter.

3.5. Acknowledgements (optional)

Acknowledgements shall be brief and should not exceed one page when typed in single spacing Times New Roman with font size 12 within the specified margin of the page. It should begin with title **ACKNOWLEDGEMENTS** Times New Roman with font size 14 bold as heading placed in centre. The signature of the candidate shall be made at the bottom right end above his./her name typed in title case.

3.6. Table of Contents

The table of contents should list all the contents following this section. The preceding section like the Title Page, Certificate and Acknowledgements will not find a place amongst the items listed in the Table of Contents, but the page numbers in lower case Roman letters shall be accounted for them. The title **TABLE OF CONTENTS** in Times New Roman with size 14 bold as heading be placed in centre. **One and a half spacing** should be adopted for typing the contents in a manner shown in specimen copy of the Table of Contents as given in Annexure V.

3.7. List of Tables

The list of tables should use exactly the same numbers and captions as they appear above the tables in the text. See sections 3.11 and 5.3 for the style of titling, numbering and placing of tables. Single spacing in Times New Roman with size 12 should be used.

3.8. List of Figures

The list of figures should use exactly the same numbers and captions as they appear below the figures in the text. See section 3.11 and 5.3 for the style of titling, numbering and placing of figures. Single spacing in Times New Roman with size 12 should be used.

3.9. List of Symbols, Abbreviations and Nomenclature

Single spacing in Times New Roman with size 12 should be used typing the matter under this head. As far as possible, standard and popularly used symbols, abbreviations etc. should be adopted.

3.10. Chapters

Chapters of a thesis may be broadly divided into 3 parts (i) introduction, literature survey and identification of problem and issues (ii) statement, formulation and presentation of the problem, solution approach (iii) findings, results, discussion, implementation and conclusions, and directions for future research.

Each part may be suitably divided into several chapters, and a chapter may be further divided into several sections and sub-sections, sub-sub-sections.

Each chapter should be given an appropriate title.

Tables and figures in a chapter should be typed in title mode in single space in Times New Roman with font size 12. The titles of tables should be placed directly above the table whereas the titles of figures should be placed directly

underneath the figure in the very same page which refers to the contents they annotate.

Footnotes should be used sparingly. They should be typed single space and placed directly underneath in the very same page which refers to the material they annotate.

3.11. Tables and figures

By the word Table is meant the representation of tabulated numerical as well as non-numerical data in the body of the thesis and also in the appendices. All other non-verbal material used in the body of the thesis and appendices such as charts, graphs, maps, photographs and diagrams may be designated as figures. A proper representation of a table or a figure and its placement immensely add to the ability to comprehend the work. Here are few suggestive guide lines in this regard which, of course, in no way substitute the ingenuity and creativity of an author.

A table or figure including its caption should be accommodated within the prescribed margin limits and should appear on the page where its reference is made or on the page following the page in case it is not possible to place it on the same page.

Table and figures on half or less in length should necessarily appear on the same page along with the text. However, they should be separated from the text both above and below by double spacing.

All tables and figures should be prepared on the same paper or material used for the preparation of the rest of the thesis.

Captions of table/figures may use characters, numerals or symbols in the title mode.

Two or more small tables or figures may be grouped if necessary on a single page.

Wherever possible, the entire colour photographs(s) may be reproduced on a full sheet of photographic paper. More than one photograph can be included on a page.

Samples of fabric, leather, etc., if absolutely necessary may be attached evenly in a page and fixed/ pasted suitably and should be treated as figures.

3.12. Citation of References in the Thesis

Any work of other researchers used either directly or indirectly used in the research must be indicated at appropriate places in the thesis. It could be a journal paper, a paper in conference proceedings, a monograph, a personal communication, or a book; in physical or electronic form. The standard should be followed as given below:

- If more than two authors the “Sir name of the first author et al. []”
e.g., [73] A. Rao, R. K. Singh, and N. Srivastava, “In band Full-duplex Radio: A survey” in International Journal of Applied Engineering Research, 2019, vol I, pp. 81-86. **Should be cited as Rao et al. [73]**
- If two authors then “Sir name of first and Sirname of second author []”
e.g., [79] S. Sawyer and P.J. Guiman, “Software Development: Processing and Performance,” BM Syst. J., vol 37, no. 4, pp. 552-569, 1998. **Should be cited as Sawyer and Guinan [79]**
- If single author paper then “Full name of author []”

e.g., [72] R. Snijders, “Crowded Centric Requirements,” in International Conference on Utility and Cloud Computing, 2014, pp. 614-615. **Should be cited as R. Snijders [72]**

3.13. Listing of References in the REFERENCE section

The listing of references should be typed in alphabetical order of the first author's name in single spacing starting 4 spaces below the heading **REFERENCES** in Times New Roman with font size 14 bold. The references should be serially numbered, separated by single space. For typing the references, Times New Roman with font size 11 is recommended. Few suggestive examples given in section 8 should be followed for referencing.

3.14. Appendices

Appendices in a thesis are provided to give supplementary information, which if included in the main text may serve as a distraction and could tend to dilute the central theme under discussion.

Each appendix must find its reference in the main body of the thesis.

Appendices shall carry the title of the contents reported and the same title shall be made in the contents page also.

Appendices should be numbered using Roman numerals in upper case, e.g. Appendix I, Appendix II, etc.

Figures, tables, equations and references appearing in appendices should be numbered locally to an appendix e.g. II.1, II.2, III.5, etc. and should be referred to at appropriate places just as in the case of chapters.

3.15. List of Publications of the Candidate

The list of publications made by research scholar during the period of research and pertaining to the thesis submitted for the degree should be listed in **chronological order** in the order of international refereed journals, national refereed journals, proceedings of the conferences, in the same style as followed in providing the list of references (section 8). These publications, wherever relevant should be referred to in the main body of the thesis.

3.16. Curriculum Vitae

A vita mentioning the salient achievements and potentialities of the candidate shall be made at the end of the thesis starting 4 spaces below the heading **Curriculum Vitae** (in Times New Roman with font size 14 bold) and shall be made in preferably three paragraphs in single spacing using Times New Roman using 12 size and shall be restricted to a single page.

4. TYPING INSTRUCTIONS

4.1. General

This section includes additional information for final typing of the thesis. Some information given earlier under ‘Manuscript Preparation’ shall also be referred to.

The impression on the typed/ duplicated/ printed copies should be black in colour.

Certain symbols characters or markings not found in a standard word processor may be hand written using Indian ink or a stylus pen (in case stencil sheets are used). Corrections, interlineations and crossing out of letters or words is not permitted in any of the copies of the thesis intended for submission. Erasures, if made, should be neatly carried out in all copies.

A sub-heading at the bottom of a page must have at least **one** full line below it or else it should be carried over to the next page.

The last word of any page should not be split using a hyphen.

Line spacing of **1.15** should be used for typing the general text. The general text shall be typed in font Style Times New Roman and Font Size 12.

- Line spacing of **1.15** should also be used for typing:
- Long Tables
- Long quotations
- Foot notes
- Multilane captions
- References

All quotations exceeding one line should be typed in an indented space - the indentation being 15mm from either margin.

4.2. Chapters, Sections, Sub-sections, and Paragraphs

The format for typing Chapter headings, Section headings and sub-section headings are explained through the following illustrative examples.

Chapter headings	:	CHAPTER 1 INTRODUCTION
Section	:	1.1 OUTLINE OF THESIS
Sub-section heading	:	1.1.1 Literature Review.

The word **CHAPTER (no.)** without punctuation should be centered 50mm down from the top of the page. Two spaces below, the title of the chapter should be typed centrally in upper case (capital letters) **TITLE OF THE CHAPTER**. The text should commence 4 spaces below this title, the first letter of the text starting 10mm, inside from the left-hand margin.

The section or sub-section headings preceded by their numberings should be left-justified. The typed material directly below section or sub-section headings should commence **one** space below it and should be offset 10mm from the left-hand margin. The text can be divided over paragraphs within a section or sub-section. Each paragraph should commence one space below the last line of the preceding paragraph, the first letter in the paragraph being indented from the left-hand margin by 10mm. The last paragraph of any heading should follow two spaces before the next section heading.

5. NUMBERING INSTRUCTIONS

5.1. Page Numbering

The preliminary pages of the thesis (such as Title page, Acknowledgement, Table of Contents etc.) should be numbered in lower case Roman numerals e.g. (i), (ii), (iii), The Title page, however, will be treated numbered as (i) but this will not be typed. The page immediately following the title page shall be numbered (ii) and it should appear at the bottom center of the page, and so on. Pages of the main text, starting with Chapter 1 should be consecutively numbered using Arabic numerals e.g. 1, 2, All page numbers (whether Roman or Arabic) should be typed without punctuation in the center of the page 15mm above from the bottom.

5.2. Numbering of Chapters, Sections and Sub-sections

The numbering of Chapters, sections and sub-sections should be done using Arabic numerals only and further decimal notation should be used for numbering the sections and sub-sections within a chapter. For examples sub-section 4 under section 3 of chapter 2 should be numbered as 2.3.4. The heading for a section or a sub-section should immediately follow in the same line after the number with a line spacing of 1.15 in between.

Appendices and their sections and sub-sections should be numbered in an identical manner using upper case Roman e.g. I, II, starting with Appendix I.

5.3. Numbering of Tables and Figures

Tables and figures appearing anywhere in the thesis should bear appropriate numbers.

The rule for assigning such numbers is illustrated through an example. If a figure in Chapter 3, happens to be the fourth then Fig. 3.4 is assigned to that figure. Identical rules apply for tables except that the word figure is replaced by the word Table. If figures (or tables) appear in appendices, for example the third figure in Appendix II will be designated as Fig. II.3. If a table is to be continued into the next page, then a line should be drawn underneath an unfinished table and the phrase continued on page no... placed on the right side and underlined should be typed just below the line. The top line of the table continued on the next page should, for example read Table 2.1 (continued) placed centrally and underlined.

While referring to a figure or table in the body of the thesis it should be referred to as Fig. 3.4, Table 2.1, Table II.6, and so on.

5.4. Numbering of Equations

Equations appearing in each Chapter or Appendix should be numbered serially, the numbering commencing afresh for each Chapter or Appendix. For example, the eighth equation in Chapter 2, should be numbered as (2.8) thus:

$$p_f = \frac{p_f^1}{1-p_f^0+p_f^1}, \quad (2.8)$$

While referring to this equation in the body of the thesis it should be referred to as Eq. (2.8).

6. THESIS SUBMISSION AND BINDING SPECIFICATIONS

6.1. Preparation of Research Summary

After the completion of the research work and preparation of the draft thesis, a research summary is to be prepared in close contact with the thesis supervisor(s). It should begin with the title of the thesis (in Times New Roman with size 14 bold, centered), a single space gap, followed by the name and enrollment of the candidate (in Times New Roman with size 12 bold, centered) and then a single space gap followed by the title **Research Summary** (in Times New Roman with size 12 bold, centered). After a gap of a space, the text should begin on the same page (there is no need for a title page).

Like the thesis, the Research Summary may be broadly divided into parts:

- (i) introduction, literature survey and identification of problem and issues.
- (ii) statement, formulation and presentation of the problem, solution approach.
- (iii) findings, results, discussion, implementation and conclusions, and directions for future research.

It should be typed single line spacing, in Times New Roman with size 12 within the specified margin of the page. The total number of typed pages should not exceed 10. The use of tables, figures, equations should be absolutely minimum unless they are extremely essential. Only the essential references should appear in the text. Sections and subsections (not exactly the same as used in the main thesis) may be used to enhance the readability. Only minimal essential part of appendices and reference list should be included as part of the Research Summary.

6.2. Submission for Evaluation

- a. The thesis and research summary should be prepared as per guidelines provided in this manual. In case of any problems, the supervisor(s) should be contacted.
- b. The candidate should fill the checklist and sign the Certificate of Thesis Submission for Evaluation (Annexure VI). The Certificate should be signed and submitted in duplicate. One copy after stamping by the concerned University official with due entries will be returned to the candidate.
- c. For evaluation purposes, a candidate for Ph. D. degree is required to submit
 - i. Four copies of Research Summary
 - ii. Four hard copies of the thesis printed on both sides and spiral bound using flexible cover of thick white art paper. The cover page should be printed as per specifications for the title page (Annexure I).
 - iii. A CD with exactly identical contents in pdf format. The candidate should ensure that the CD can be opened on any system.
 - iv. A plagiarism report of the thesis having similarity index less than 20%.
 - v. Pre-Ph.D. course work completion certificate.
 - vi. RDC permission for submission of thesis.
 - vii. Reprint of published research papers/acceptance letters.
 - viii. Fee receipts.
- d. For evaluation purposes, a candidate for M. Tech. or M. Pharm. degree is required to submit

- i. Three hard copies of the thesis printed on both sides and spiral bound using flexible cover of thick white art paper. The cover page should be printed as per specifications for the title page (Section 3.2).
- ii. A CD with exactly identical contents in pdf format. The candidate should ensure that the CD can be opened on any system.
- iii. Institute Permission for submission of thesis.
- iv. A plagiarism report of the thesis having similarity index less than 20%.

6.3. Final Submission

After the successful completion of viva-voce examination and with approval of the viva-voce board, the candidate should finalize the thesis incorporating all the suggestions made during the evaluation process by the internal and external examiners and the suggestions emerging during viva-voce examinations including modifications in the title of the thesis.

Following should then be submitted:

- a. Certificate of Final Thesis Submission (Annexure VII) signed by the candidate and the supervisor(s) certifying that all the corrections suggested by the examiners have been incorporated, the thesis has been prepared as per guidelines, due credit to other researchers have been appropriately accorded and no part of the thesis is copied from any other source.
- b. The final thesis should be printed on both sides on good quality white paper not less than 80gsm and hard bound as per specifications given in Annexure VIII, IX, and X, as applicable. The cover page should be printed as per specifications for the title page (Annexure I) except that it will include month and year of final submission.
- c. Colour Code: The colour code for the thesis will be as follows:
 - i. **M. Tech.** - bound with hard cover not less than 120 gsm with **light blue** with impressions printed in **black** colour. The side back of the thesis should also carry the title, name of candidate and month and year of final submission (Annexure VIII).
 - ii. **M.Pharm.** - bound with hard cover not less than 120 gsm with **light pink** with impressions printed in **black** colour. The side back of the thesis should also carry the title, name of candidate and month and year of final submission (Annexure IX).
 - iii. **Ph. D.** – cloth bound **dark blue** background with impressions embossed in permanent **golden colour**. The side back of the thesis should also carry the title, name of candidate and month and year of final submission (Annexure X).
- d. For electronic repository of the University, a CD with exactly identical contents as the final thesis in pdf format should also be submitted. The candidate should ensure that the CD can be opened on any system. The CD should carry the name, enrollment number and program of the candidate.
- e. **Number of copies** (incorporating all corrections including viva-voce examination)

Ph.D.: Two copies printed on both sides and hard bound as per University specifications, plus a CD with thesis contents in pdf format.

M.Tech / M.Pharm.: Two copies printed on both sides and hard bound as per University specifications plus a CD with thesis contents in pdf format.

Note : The candidate must submit the required **certificates** at the time of both the submissions (a) for evaluation and (b) final after viva-voce examination for provisional degree certificate.

7. SIZE OF THESIS

There is no rigid restriction on the size of the thesis. However, for Ph.D., it should not generally exceed 300 pages of the typed matter beginning from the first page of Chapter 1 to the last page of the last Appendix. Similarly, for M.Tech., it should not generally exceed around 150 pages.

8. REFERENCES

For knowing more about the styles and presentation, the following few references should be followed:

Journal Research Papers:

1. Nintanavongsa, Prusayon, Ufuk Muncuk, David Richard Lewis, and Kaushik Roy Chowdhury. "Design optimization and implementation for RF energy harvesting circuits." *IEEE Journal on emerging and selected topics in circuits and systems* 2, no. 1 (2012): 24-33.
2. Lee, Hoon, Sang-Rim Lee, Kyoung-Jae Lee, Han-Bae Kong, and Inkyu Lee. "Optimal beamforming designs for wireless information and power transfer in MISO interference channels." *IEEE Transactions on Wireless Communications* 14, no. 9 (2015): 4810-4821.
3. Mo, Jeonghoon, Hoi-Sheung Wilson So, and Jean Walrand. "Comparison of multichannel MAC protocols." *IEEE Transactions on mobile computing* 7, no. 1 (2008): 50-65.

Magazines:

1. Candès, Emmanuel J., and Michael B. Wakin. "An introduction to compressive sampling [a sensing/sampling paradigm that goes against the common knowledge in data acquisition]." *IEEE signal processing magazine* 25, no. 2 (2008): 21-30.
2. Leaves, Paul, Klaus Moessner, Rahim Tafazolli, David Grandblaise, Didier Bourse, Ralf Tonjes, and Michele Breveglieri. "Dynamic spectrum allocation in composite reconfigurable wireless networks." *IEEE Communications Magazine* 42, no. 5 (2004): 72-81.
3. Demestichas, Panagiotis, Guillaume Vivier, Karim El-Khazen, and M. Theologou. "Evolution in wireless systems management concepts: from composite radio environments to reconfigurability." *IEEE Communications Magazine* 42, no. 5 (2004): 90-98.

Conference Papers:

- 1 Clancy, T. Charles. "Achievable capacity under the interference temperature model." In *IEEE INFOCOM 2007-26th IEEE International Conference on Computer Communications*, pp. 794-802. IEEE, 2007.
- 2 Pandharipande, Ashish, and J-PMG Linnartz. "Performance analysis of primary user detection in a multiple antenna cognitive radio." In *2007 IEEE International Conference on Communications*, pp. 6482-6486. IEEE, 2007.
- 3 Zheng, Haitao, and Chunyi Peng. "Collaboration and fairness in opportunistic spectrum access." In *IEEE International Conference on Communications, 2005. ICC 2005. 2005*, vol. 5, pp. 3132-3136. IEEE, 2005.

Symposium Papers:

- 1 Buddhikot, Milind M., Paul Kolodzy, Scott Miller, Kevin Ryan, and Jason Evans. "DIMSUNet: new directions in wireless networking using coordinated dynamic spectrum." In *Sixth IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks*, pp. 78-85. IEEE, 2005.
- 2 Pérez-Romero, Jordi, Oriol Sallent, Ramón Agustí, and Lorenza Giupponi. "A novel on-demand cognitive pilot channel enabling dynamic spectrum allocation." In *2007 2nd IEEE international symposium on new frontiers in dynamic spectrum access networks*, pp. 46-54. IEEE, 2007.
- 3 Raman, Chandrasekharan, Roy D. Yates, and Narayan B. Mandayam. "Scheduling variable rate links via a spectrum server." In *First IEEE International Symposium on New Frontiers in Dynamic Spectrum Access Networks, 2005. DySPAN 2005.*, pp. 110-118. IEEE, 2005.

Workshop Papers:

- 1 Mitola Iii, Joseph. "Cognitive radio for flexible mobile multimedia communications." *Mobile Networks and Applications* 6, no. 5 (2001): 435-441.
- 2 Holland, Oliver, Vasilis Friderikos, and A. Hamid Aghvami. "Green spectrum management for mobile operators." In *2010 IEEE Globecom Workshops*, pp. 1458-1463. IEEE, 2010.
- 3 Cabric, Danijela, Artem Tkachenko, and Robert W. Brodersen. "Experimental study of spectrum sensing based on energy detection and network cooperation." In *Proceedings of the first international workshop on Technology and policy for accessing spectrum*, p. 12. ACM, 2006.

Books:

- 1 Marsch, Patrick, and Gerhard P. Fettweis, eds. *Coordinated Multi-Point in Mobile Communications: from theory to practice*. Cambridge University Press, 2011.
- 2 Xiao, Yang, and Fei Hu, eds. *Cognitive radio networks*. CRC press, 2008.
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**A Thesis Submitted
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for the Degree of**

**DOCTOR OF PHILOSOPHY
in
FIELD OF SPECIALIZATION**

by

**NAME OF STUDENT
(Enrollment No.)**

**Under the Supervision of
Dr. NAME OF SUPERVISOR
Institution**



to the

FACULTY OF

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