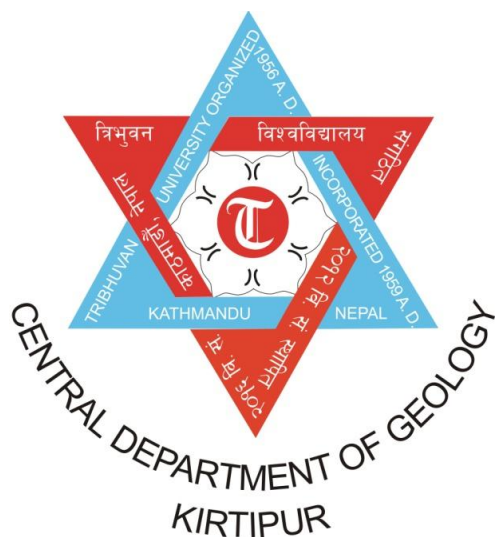
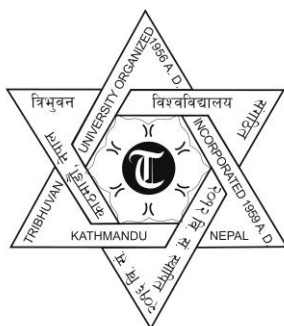


M. Sc. GEOLOGY
and
ENGINEERING GEOLOGY
DISSERTATION
GUIDELINE



M. Sc. GEOLOGY
and
ENGINEERING GEOLOGY
DISSERTATION GUIDELINE
(Revised Edition)



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Message from the Head of the Department

The dissertation research is mandatory for all M. Sc. Geology and Engineering Geology students of Tribhuvan University in partial fulfillment for the award of the degree of Master of Science in Geology/Engineering Geology. In order to make all dissertation researches standard and uniform, this guideline has been prepared. I hope this will help students to write their master thesis in systematic and scientific way. I also hope that this will provide a baseline for the scientific writing to the students in the future as a professional in the field of Geology/Engineering Geology.

I would like to thank Associate Professor Dr. Khum Narayan Paudyal for preparing this guideline.

Dr. Lalu Paudel
Head
Central Department of Geology
Tribhuvan University
Kirtipur, Kathmandu
NEPAL

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SECTION-I

INTRODUCTION

1.1. Background

Tribhuvan University started Bachelors in Geology (B. Sc.) at the Tri-Chandra Campus in 2024 B. S. and Masters in Geology (M. Sc.) in 2032 B. S. In 2042 B. S. the Central Department of Geology (CDG) was established to conduct M. Sc. program at the premises of Tribhuvan University at Kirtipur. Since its beginning of the masters level the dissertation research is mandatory for all M. Sc. Geology students of Tribhuvan University in partial fulfillment for the award of the degree of Master of Science in Geology. The Central Department of Geology started M. Sc. in Engineering Geology since 2072 B. S. To make the dissertation uniform, standard and authentic this guideline has been prepared. This guideline follows current international trends and norms of the scientific writing in Geology/Engineering Geology related dissertations. This includes the general procedure to be followed prior and during inception of research, field work, laboratory work, dissertation writing, submission and evaluation.

1.2. Implementation of dissertation guideline

This guideline has been prepared by the CDG as per the curriculum requirement of the Tribhuvan University. The CDG and Dean's office, Institute of Science and Technology will monitor the implementation of this guideline. The Central Department of Geology reserves the right to explain, extend and amend the guideline as and when required.

1.3. Minimum requirement of the dissertation

- a. The copyright authority of the M. Sc. Geology/Engineering geology dissertation is reserved to Tribhuvan University.

- b. The dissertation must provide a distinct contribution to the knowledge of the subject and afford evidence of originality as a part of field work as well as laboratory experiments. It must be of a satisfactory literary standard and must be suitable for publication as a dissertation of Tribhuvan University.

- c. The dissertation must consist of the student's account of his/her own research. A student will not be permitted to submit a dissertation consisting wholly of the work for which a degree has been conferred on him/her in this or any other University.

- d. The research proposal and dissertation must be submitted in a form as prescribed in this document.

- e. It is candidate's responsibility to prepare and assemble all material for the dissertation, and to have the pages of the dissertation in a correct order.

- f. Close attention should be paid by the students so that the text and all illustrative materials should be clear and free of errors. The format and technical specification should be as guided by this document.

SECTION-II

PROCEDURE, STYLE AND FORMAT

STEP 1: Inception of the dissertation proposal

M. Sc. Geology/Engineering Geology students when admitted to fourth semester will be notified by the department to submit their intention in the possible areas of dissertation research related to their field of study as per M. Sc. Geology/Engineering Geology curriculum. The student should submit the outline of the research concept on his/her dissertation research.

STEP 2: Appointment of supervisor (s)

The head of the department of the CDG will appoint faculty members or experts with at least Masters or higher degree in Geology and related field, as supervisor (s). The basis of selection of supervisor (s) generally will be based on their expertise related to intended dissertation research. However, the main supervisor must be full time faculty member of CDG.

STEP 3: Proposal writing, defense and approval of the dissertation proposal

After official announcements, the student shall write and prepare the proposal of dissertation research under the guidance of main supervisor and with consultation to other supervisors. The proposal of dissertation must be written in a standard format given by this guideline. The CDG will call for open defense of the proposals of dissertation research. The head of the CDG will chair the committee and all faculties (and, if required experts from the related field from outside) will be the members. The committee

will approve the proposal. If necessary, the student shall be asked to do corrections and amendments before the approval of the proposal. Under special circumstances, the head of the department can amend or revise the approved proposal in consultation with concerned student and supervisors. In the case of any dispute or difficulties, the final decision will be made by the head of the department in regards of dissertation research. The student must work as per approved or amended proposal and must follow the instructions from the head of the department.

STEP 4: Field work

After the proposal of the dissertation research is completed the student along with the consultation of his/her supervisors the student should prepare for the field work. The dissertation will ordinarily include from four to six weeks of fieldwork. The dissertation supervisor will accompany the student to train the basic concepts of mapping, sampling, data collection and computing procedures in the field. The supervisor may stay in field with the student for 1 to 2 weeks. Necessary field equipments (if available) will be provided by the CDG for entire field work. The students are responsible for the care of the apparatus and equipments.

STEP 5: Laboratory work

After the field work is over the supervisor will guide the student for the analysis of the collected data at the CDG laboratory. The head of the CDG will contact the possible laboratories for further analysis, if such facilities are not available at CDG. In such case the students will be posted to the identified laboratories and such laboratories should be well equipped, government recognized and

also recognized by the CDG and Tribhuvan University. The student will make close contact with supervisors for the entire period of field work, laboratory analysis and dissertation writing.

STEP 6: Progress report

The progress report of the dissertation will be submitted by the student to the head of the department of CDG through his/her supervisors.

STEP 7: Dissertation write up

After the completion of field work as well as the laboratory work or having enough data acquired for writing dissertation the student will be informed to write up the outcome of their research in a standard format.

STEP 8: Dissertation and manuscript submission

The dissertation shall be accepted two times a year through his/her supervisor. Exact submission deadline will be announced by the CDG each time. The student must submit at least two copies loose bound or spiral bound of well prepared and duly signed dissertation to the CDG for the approval. A manuscript based on research also should be submitted for publication along with the dissertation. If any student has submitted his/her manuscript to any other academic journal, he/she should submit the evidence of submission or acceptance to CDG. Submitted manuscripts will be published in Bulletin of Department of Geology after peer review process. The head of the department of CDG will approve and will forward for the further process of examination and evaluation of the dissertation and manuscripts on

the basis of this guideline. The approval authority can return the dissertation or/and manuscript to the student for necessary amendments before its approval. The student should correct the dissertation or/and manuscript and resubmit it to CDG within one week.

STEP 9: Evaluation and date of viva-voce defense

The dissertation will be forwarded to internal examiner (one of the full time faculty member of the CDG at least having M. Sc. degree in Geology) and external examiner (appointed by Dean's office, Institute of Science and technology, Tribhuvan University from the roster of dissertation examiners). The CDG will publish the date of examination and viva-voce open defense. In general, viva-voce open defense shall not be conducted before 7 days of appointment of an external examiner.

STEP 10: Examination through open defense

The examination through open viva-voce defense will be held at CDG. The dissertation will be evaluated at the public defense by the panel of external and internal examiners, head of the department and supervisors. However, the concerned authority of Tribhuvan University may attend the defense as an observer.

STEP 11: Corrections and incorporation of comments

All the errors in the dissertation will be corrected by the student as per necessary instructions given by the examiners. The marks will not be sent to the Dean's office until the corrected copies of dissertation are received.

STEP 12: Final submission/resubmission

If the dissertation is rejected with major errors either in methodology and data, interpretation of results, the student is required to resubmit his/her dissertation in the next session. In case of minor corrections, final dissertation should be submitted within one month of the examination date. After corrections and signing the final 2 copies of dissertation, it should be submitted to CDG. A soft copy of whole dissertation in CD in MS word or PDF format should be submitted to the CDG. Only after the final submission and approval of the dissertation, evaluation marks will be sent to the examination section of Dean's office, Institute of Science and Technology, Tribhuvan University.

SECTION-III

DISSERTATION RESEARCH PROPOSAL WRITING

Dissertation research proposal should be written in standard format as mentioned in this document. The proposal must be submitted for the original research work. There must not be duplication or replication of previously accepted or published research work. The research should be based on field work as well as laboratory work on respective specialized field of geology and should be focused on field mapping, sample collection, laboratory analysis of samples and data analysis techniques. The result obtained from such study should be compared with one or more standard methods to check the validity of the result.

The body of the research proposal shall not exceed 10 pages. This pagination does not include the title page, summary, and appendices. The proposal should be written in similar format as given in the dissertation write up.

3.1. Format of the dissertation research proposals

1. Title page

The title sheet includes the information ordinarily encountered on title page of the dissertation except that the proposal should be labeled as a dissertation proposal, not as a dissertation. The title should be concise generally within 20 words as far as possible.

2. Summary

The proposal summary is expected to be brief (not to exceed 350 words) and should be summarizing the following sub-topics such

as introduction or background, problems, objectives, literature review, methodology, expected results, work plan and references.

3. Introduction

This section introduces the domain of the study and provides general overview of the circumstances, issues and background of the investigation. The introduction section should include: Background of the study and statement of the problem and location of the study area. Introduction is normally 1-2 pages.

4. Literature review

This section should be brief and specific but critical review of relevant and recent literature directly and/or closely related to the research theme of the dissertation. The student shall review current and relevant journal articles, books and other sources (dissertations, conference proceedings). The student should review all full length original articles of the study area, if available. While reviewing the literature, dissertation work done by previous students of CDG should also be thoroughly reviewed. Reference should be given for each statement in a standard format as mentioned and establish relevancy of his/her proposed research.

5. Objectives

This section should be written in bullet form or in a paragraph form without sub-headings. While writing this section the referencing should be done and for each statement the reference shall be written in bracket as mentioned in reference section of this document. The statement shall highlight why the present research is proposed and what is the genesis of the research

problem. While writing objectives, the use of action oriented verbs are discouraged rather result oriented verbs are encouraged. General objective should be directly relevant to the title of dissertation proposal. Specific objectives should be clear, concise and pin pointed (maximum 5 points based on hypothesis).

6. Methodology

The research methodology includes the procedure of the study. Duration and type of field work and laboratory work should clearly be indicated. Type of study, duration, laboratory setting and research design should be given without subheading in a journal article writing style. However, samples and sampling methods, experimental methods or laboratory methods and data collection methods should be described in detail with separate subheadings as and when required. The method section should be described under subheadings- field mapping, sample collection, transportation, preservation, laboratory analysis and or secondary data collection and analysis. The experimental procedures should be described in detail in order to meet the objective of the study. Research flow diagram should be included for the overview of the research procedures.

If previously reported methods will be used for the experimental work for each performed method reference should be given. The reference shall be written in bracket as mentioned in reference section of this document. Generally, at least techniques adapted in the field and the sample preparation procedures shall be mentioned. Separated list of the instrument and chemicals is not required in this section but that can be listed in appendix. Statistical analysis methods shall not be described in detail.

However, if required the statistical tools and techniques used for data analysis or verification shall be mentioned briefly.

8. Expected outcome

Possible outcome of the proposed research should be postulated in this section. Expected outcome include enhancement in academic knowledge in proposed area of the study, utility of the research and direct or indirect beneficiaries or as major discovery.

9. Time frame of the study

Proposed time frame and activities of the study should be presented in this section. The time frame may vary according to the topic of the proposed research. Time frame for literature review, field work, laboratory analysis, data synthesis and time needed for writing thesis should be calculated accordingly.

10. Budgeting

Budgeting should be presented stating the expenses expected in the proposed research specially, the expenses of consumables and laboratory supplies. Budget can be mentioned under multiple headings depending upon the nature of proposed study. However every item and amounts allocated in the budget should be justified.

11. References

All studies cited for proposal writing should be listed in a standard format (as mentioned in the reference section). Only the references cited in the text should be included in the list of references.

12. Appendices (if necessary)

Any relevant information that is not accommodated in the main text section is provided in the Appendices. Students should consider the use of Appendices to present such items as instructions, consent forms, tables, figures and lengthy descriptions. If any of these documents are lengthy, they may be abridged.

SECTION-IV

DISSERTATION FORMAT

4.1. Technical specification

1. Language

The dissertation must be written in English language. Spelling should be either US English or British English. The mixture of these two will not be accepted.

2. Dissertation length and volume

A typical dissertation length must be of 50 to 100 pages, but not less than that. This does not include preliminary pages and appendices. While maintaining the page number of the dissertation the chapters the Introduction, Literature Review, Materials and Methods, Results, Discussion, Conclusions/Recommendations and References should be numbered as paginated pages and shall be denoted by Arabic numbers.

3. Paper

The dissertations must be printed on one side only of good grade and quality white paper (usually of 80 g weight) of A4 size (210 mm x 297 mm).

4. Production of dissertation manuscript

Dissertation must be produced with printing done on a high quality printer. Only original copy or good and clean photocopies

are acceptable. Printer settings should be in A4 size. Letter size print will be accepted.

5. Typeface and Font Size

Appropriate typeface for the dissertation is Time New Roman. The font size should be 12 point, and the same typeface must be used throughout the text, including heading and page numbers. Font should not be scripted or italicized except for scientific names and conventionally used for scientific terms and terms in the different languages. Bold print should be used for headings.

6. Margins

The top, bottom and right margins should be 2.5 cm in width and left hand margin should be 3 cm in width to allow for loss in binding. The text must be justified on both sides.

7. Line spacing

Line spacing of 1.5 must be used in between lines. Two line spacing must be used between paragraphs and sections. Single spacing is permitted within:

- a. Explanatory footnotes
- b. References (except between entries)
- c. Multi-line (tables, figures)
- d. Appendices
- e. Headings and sub-headings

A new paragraph should be at least two lines at the bottom of the page. Otherwise, the new paragraph should start in a new page.

8. Pagination

- a. All pages should be numbered at right bottom margin 1.25 cm from the edge of the page. Page numbers should appear by themselves and should not be placed in brackets, hyphenated or accompanied by other decorative devices.
- b. Page should be numbered consecutively throughout the dissertation, including page for tables, figures, photographs and texts.
- c. The preliminary pages (preceding Chapter I) must be numbered in consecutively in lower case Roman numerals (e.g. i, ii, iii, and so on). The title page should not be numbered although it is counted as page i.
- d. The text page must be numbered in Arabic cardinal numbers. Page 1 begins with the first page of the Introduction (for Chapter I) but not numbered. Subsequent pages should be numbered beginning with page 2. Each chapter should begin on a new page.
- e. Appendices are numbered consequently in upper case Roman numerals (I, II) at the bottom right of each page, starting with I.
- f. Landscape and portrait should have same page numbers.

9. Chapter Layout

The text in a chapter can be divided into major sections and sub-sections. The major sections and sub-sections are numbered according to following schemes:

Arabic numbers separated by period(s). The major sections are numbered as first level (e.g. CHAPTER I, CHAPTER II, etc.) the sub-sections are numbered as second level (e.g. 1.1, 1.2, 1.3 etc.), third level (e.g. 1.1.1, 1.1.2, etc.). After third level the section can be numbered with subsection as (a), (b), (c), etc.

Students must ensure that it is consistent throughout the dissertation and it is limited to 3 levels as far possible.

10. Tables

- a. The general format of table is simple.
- b. The table number and accompanying title is placed above the body of the table and left justified.
- c. Table numbers should be given sequentially (e.g. Table 1, Table 2 etc.).
- d. Table titles should be focused, descriptive and short. The table caption should be of 10 pts.
- e. Excessively large and complex tables that require multiple pages are discouraged, but if necessary, secondary pages should state 'Table x cont...' and repeat the headings.
- f. Table footer legend are used to explain symbols, notes on a statistical analysis, definition of abbreviation, amplify certain expects of the table or recognize sources.
- g. The text should cite a table when data are noted.

h. When necessary, a smaller font may be used to allow the entire table fit on one page.

i. When placing tables or illustrations horizontally (landscaped). They must face the reader when turned to 90 degrees to the right or clockwise (i.e. when in standard reading orientation, the top of the table should be on left side of the page). Page number must remain in the same position as the pages of regular text, i.e. at the bottom of the un-rotated page.

11. Figures

a. Figure captions should be placed immediately below the figure. This indicates the figure number (e.g. Figure 1) followed by concise, descriptive statement.

b. Figure numbers should be given sequentially (e.g. Figure 1, Figure 2, etc.).

c. Color can be used in graphs and maps. If color is used, originals must be provided for all copies.

d. Generally a figure should occupy a separate page without page number. However, if it is integrated within a page of text (with page number), there must be 2 point space before and after to clearly set it apart from the text. The figure caption should be of 10 pts.

e. The text should cite a figure when those data are noted.

f. Handmade figures are not accepted. Graphics softwares (ArcGIS, CorelDRAW, Macromedia FreeHand or Adobe Photoshop, Adobe Illustrator) can be used for making figures.

12. Photographs

a. The pages of the photographs, photomicrographs and glossy prints etc. should be placed in appropriate places.

b. The recommended size of the photograph is 10 x 15 cm.

c. Photographs, photomicrographs should not be pasted instead the scanned copy of images should be printed in glossy paper.

d. Photographs number should be given sequentially (e.g. Photograph 1, Photograph 2, etc.).

e. Photograph captions should be placed immediately below the photograph. The caption should be of 10 pts.

f. Page number should not be given for the photograph pages.

g. Big geological maps and other large data sheets can be placed at the inner side of the back cover with proper arrangement.

13. Use of color

Colored maps and graphics may be used when appropriate. However, all copies of the thesis must be identical.

14. Correction of errors

a. A dissertation must be free of typological errors. Corrections made in ink or with opaque fluid are not acceptable.

b. Addition of word or phrases must not be typed between lines or inserted by hand. The whole page must be re-typed to incorporate the additions.

c. Pages which are obviously insert pages are not acceptable. The surrounding pages should be retyped to incorporate the material.

4.2. Citation of literature

The bibliographical information from all the literature referred in the text must be presented. This way the references can be identified and the original publications can be found. Text should include references to the original publications used. References are shown also, when presenting tables/figure etc. collected from data in publications. The most important in citation of reference in text is consistency. The author date system is recommended to provide information for readers to locate the source of information listed in the alphabetically selected references at the end of dissertation.

Examples:

i. For journal articles with one author

a. Paudyal (2011) reconstructed the Last Glacial climate change in the Nepal Himalaya on the basis of palynological evidences

b. On the basis of palynological evidences the Last Glacial climate change in the Nepal Himalaya was reconstructed (Paudyal 2011)...

- ii. For journal article with maximum two authors
 - a. Tethyan Zone of the upper Burhi Gandaki and Shiar Khola corresponds well with the Manang and Dolpo regions, but shows some distinct individual features (Fuchs and Paudel 1998).

 - b. Fuchs and Paudel (1998) concluded that the Tethyan Zone of the upper Burhi Gandaki and Shiar Khola corresponds well with the Manang and Dolpo regions with some distinct individual features.

- iii. Citation of more than two authors
 - a. As it is impossible to see the diagnostic characteristics under the Light Microscope, some pollen grains have been referred to the wrong genus or even family (Ferguson et al. 2007).

 - b. Ferguson et al. (2007) described that it is impossible to see the diagnostic characteristics under the Light Microscope, some pollen grains have been referred to the wrong genus or even family.

- iv. Citation more than one work
 - a. A number of researchers reported vertebrate fossils from the fluvio-lacustrine sediments of the Kathmandu Basin (West 1981; Dongol 1985).

 - b. West (1981) and Dongol (1985) reported vertebrate fossils from the fluvio-lacustrine sediments of the Kathmandu Basin.

- v. Same author, same year, different title

a. Illite crystallinity evidence for polyphase metamorphism and inverted thermal structure in the Lesser Himalaya of central Nepal has been documented (Paudel 2002a; 2002b).

vi. Same author, different year

a. Recent and future developments of Climate-Leaf Analysis Multivariate Program (CLAMP) have been described (Spicer 2007; 2008).

4.3. Scientific writing

Scientific writing should be clear, objective, accurate and concise. A M. Sc. thesis must be an original research study, or in any case it must demonstrate the student's ability for independent analysis. Students must show that they are able to develop knowledge of a topic to which the thesis is dedicated, even if only in an incremental way. This certainly means mastering what is already written on the chosen topic, but more importantly it means adding something 'original' which others have not already said. When talking about 'originality' one should not think about making radically innovative contributions. A contribution can be 'original' even when its range is limited to the proposal of a new way of interpreting a theory or existing model, to the identification and description of a phenomenon which no one has systematically analyzed yet, or to the study of a phenomenon which is already well-known, but analyzed through criteria which reveal aspects which have been neglected up to now. The replication of research which has already been carried out by others can also offer an 'original' contribution, as well as re-elaboration of existing research from a new perspective. To sum up, the originality of a MSc thesis can be found:

- # in the chosen topic;
- # in the approach or perspective taken during the study;
- # in the empirical study method applied;
- # in an innovative combination of these factors.

Even if the discussion of research results comes at the end of the project, it might be helpful to ask oneself at the start what one is expecting to find at the end of the research, and which topics will provide results. This does not mean deciding what the results of the research questions will be from the start, but verifying if a study has obvious or predictable results, or findings which are too generic. This can help one understand if the question should be fine-tuned or, in extreme cases, abandoned. The criteria of originality which is described here should be an ideal to reach for, even if the level of originality which is required for a M. Sc. thesis is not the same as that required for papers published in international academic journals. Some studies may be decidedly less original than others, but it is clear that this element will influence the study's evaluation. The M. Sc. thesis must focus on a topic which is meaningful and relevant to the student's chosen discipline area. Therefore the thesis should not come from the internship experience and simply translate internship activities into a report. Curricular internships can be, however, a source of ideas in identifying the thesis topic and related research questions. Internships can provide a part of the empirical data supporting arguments developed in the thesis, but they should not be the heart of the thesis. They can be a source of contacts which help in elaborating and extending everything that was observed during the internship period. Furthermore, not only do internships not provide the conditions needed for finding an original idea for a graduate thesis, they also are not a necessary condition. Therefore

it is important not to wait for the start of an internship before searching for a good thesis idea. It is more realistic to expect that the majority of research questions at the foundation of a thesis are not related to one's internship experience.

Writing conventions

a. The writing should be simple and easy to understand. The style of writing itself should be relatively formal – the use of slang and over use of contractions should be avoided. Scientific writing has traditionally been written in a passive voice. The pronoun 'I', 'We' and 'They' should typically not be used.

b. Everything that the researcher has performed is described in past tense. This includes the summary of the experimentation (abstract), description of material and methods, and the results obtained from the experiment. The present tense is reserved for researcher's conclusion about the experimental results, conclusion of previous researchers, and any fact that are generally accepted by the scientific field. The present tense is used in parts of the introduction and description.

c. Arabic numerals should be used before measurement units and should not be spelt out, e.g. '5 kg', NOT 'five kg'. Exemption is given to the first word of the sentence.

d. All numbers should be spelt out unless they are followed by unit of measures. Arabic numeral should be used for number 10 or more than 10. If sentence begins with number, the number should be spelt out (e.g., Three samples were collected for radiocarbon dating from this section...).

4.4. Binding

1. First copies of dissertation

- a. The final dissertation involves writing out the thesis according to the indications given in these regulations. The first two copies of dissertation should be in spiral or other loose binding with plastic sheets as cover both sides.
- b. The colored paper is not permitted for printing cover page or title page.
- c. The cover page design should be as the format given by CDG (see appendix).
- d. The dissertation proposal should not be hard bound.

2. Final dissertation

- a. The final copies of dissertation should be in permanent hard binding form in standard format.
- b. The color of the final hard bound cover of the dissertation shall be black. The binding should be as for a book in which pages are permanently secured. The cover page shall be lettered in gold with TNR typeface with 12 font size.
- c. The design of cover page shall be as given in the format (see appendix).

4.5. Order of dissertation contents

The following items must appear in the exact order

A. Preliminary pages

Cover page

Title page

Recommendation

Certificate of approval

Signature of board examiners

Acknowledgements

Abstract

Table of contents

List of tables

List of figures

List of photographs

Abbreviations

B. The Text of the Dissertation

Chapter I: Introduction and Objectives

Chapter II: Literature Review

Chapter III: Material and Methods

Chapter IV: Results

Chapter V: Discussion

Chapter VI: Conclusions and Recommendations

References

APPENDICES

A. Preliminary Pages

1. Cover and Title Pages

Title of the dissertation must be all in upper case and single spaced. The student's name, also all in upper case, must be identical on the cover and title page.

2. Recommendation

This page includes the recommendation of supervisor (s). General format of dissertation is applicable for the page. Name of the student and title of the dissertation should be same as the cover title page and both should be in bold type face. The supervisors' name, title/designation, name of institution and the address and signed with their signature and date of signing must be included (see appendix).

3. Certificate of Approval

The submitted dissertation must be approved prior to evaluation. The page is the certificate of approval and is signed by the head of the department (HOD). General format of dissertation is applicable for the page. Name of the student and title of the dissertation should be same as cover or title page and both should be in bold type face (see appendix).

4. Signature of the Board of the Examiners

This page is utilized during the evaluation of the dissertation. Signatures of members of the board of examiners should be in order—Recommended by Supervisor(s), Approved by HOD, and Examined by (External Examiner and Internal Examiner) with their full names and designations (see appendix).

5. Acknowledgements

The acknowledgements are brief notes of appreciation for technical, financial or research assistance given to the student during field works, laboratory experiments, and during write up of the dissertation. The students should acknowledge supervisors,

HOD, laboratory authorities and others who directly or indirectly contributed in the research and preparation of dissertation. It should be simple and sincere. It should be limited to single page write up. The source of research funding, secondary data, personnel communication, or sources of literatures should be duly acknowledged. The full name of the student, signature and date must be mentioned.

6. Abstract

The abstract is a concrete and descriptive summary of the work completed. It should begin with a brief but precise statement of the problem or background; followed by objective, description of the research method and design, results and conclusions. General format of dissertation is applicable for the abstract. Abstract should be written within 500 words and have not more than three paragraphs. Abstract should be completed in single page. An abstract should not include internal headings, parenthetical citations of items listed in the reference section, diagrams, or other illustrations. Key words should be relevant to the research and frequently used. It should be of maximum seven words.

7. Table of Contents

The contents must provide the page location of the preliminary pages, each chapter or headings and sub-headings, references and appendices. It contains the list of all the chapters, normally in upper case, preceded by their numbers in Roman or Arabic numerals. Subheadings should be in lower case except as required for initial letters. It is recommended that not more than three levels of subheadings be included in contents (chapter name are level 1 headings, subheadings of a chapter are level 2 headings,

subheadings of subheadings are level 3). Subsections of chapters may be numbered with Arabic numbers separated by period(s) or a combination of numerals and letters.

8. List of Tables

The list of tables includes the listing of tables (Table number, Title and Page) contained in the dissertation. The table number and title of captions of all tables must be same as in text of the dissertation. Even if there is only one table in the dissertation, List of Tables must be made.

9. List of Figures

The list of figures includes graphs, charts and maps. Figures should be listed with figure number, title and page number. Figure number and title should be exactly as mentioned in the dissertation text. Even there is single figure; it must be mentioned in the list of figures. The list should be limited to a single page as far as possible.

10. List of Photographs

List of photographs include the list of photographs and microphotographs present in the dissertation. The photograph number and caption should be exactly same as mentioned in the dissertation text. The list should be limited to a single page.

11. Appendices

All appendices of the dissertation must be listed. Appendices are numbered consequently in upper case Roman numerals (I, II, III) at the bottom right of each page, starting with I.

12. Abbreviations

If abbreviations or other symbols are used, they must be used consistently and uniformly throughout the dissertation. When many abbreviations are used, List of Abbreviations with appropriate definition should be included. These abbreviations must be valid and acceptable. The list should be sorted in alphabetical order. Universally recognized scientific symbols (cm, mm, kg, etc.) need not be listed. The list should be limited to a single page.

B. The Text of the Dissertation

Chapter I: Introduction and Objectives

Chapter II: Literature Review

Chapter III: Material and Methods

Chapter IV: Results

Chapter V: Discussion

Chapter VI: Conclusions and Recommendations

References

APPENDICES

Chapter I: Introduction

Background

This is the introductory chapter that indicates the brief introduction of the subject matter, statement of problem of genesis of research, its importance, validity, research strategy. It sets forth the context, the hypotheses to be tested and the contribution to knowledge or expected outcome of the research. The purpose of the introduction is to familiarize the reader to the subject of the thesis. Introduction describes the most crucial

background information related to the subject studied, including research problem, the history and state of art of the subject in general level. Introduction is not a literature review, and as such it is not required to refer to literature in it. Introduction is written in standard language, special terms and abbreviation should be avoided. The last paragraph of the introduction includes the aims of the work condensed into a few words. The introduction is the most important section of the research. This will be followed by Objectives, Location, Climate, Vegetation, Drainage, Limitations etc.

Chapter II: Literature Review

The chapter critically reviews the available literatures related to the topic of the dissertation in order to derive and develop problem statements and research strategies. A literature review surveys scholarly articles, books and other sources (e.g. dissertations, conference proceedings) relevant to a particular issue, area of research, or theory, providing a description, summary, and critical evaluation of each work. It is the base for experimental or analytical section of the dissertation and is to offer an overview if significant literature published in the topic. Literature selected must be up to date, analyzed and synthesized logically. The students should write with their own words. The articles, books or other relevant literature should be recently published as far as possible at least within last 10 years. The students must present a review of at least 20 research articles published in indexed peer reviewed international journals related to Geology with high impact factor that are closely or directly related to their dissertation research. Proper literature review is necessary to write a manuscript based on dissertation in form of a paper.

Chapter III: Material and Methods

The chapter describes the methods and techniques used during field work and laboratory analysis for generation and validation of data in dissertation. It must include aerial coverage of the field area, types of field work, duration of field work and sampling procedure in the field work. This is followed by the details of the laboratory analysis with procedure and apparatus or equipments used during the experimentation. The methods of secondary data collection (if any) techniques and the description of the softwares for data analysis should also be described in this chapter. Methods also include the criteria for selecting such methods and the suitability for the study, the principles, detection limits, and sources of errors, quality control and detailed description of the study performed. If the methods are described in details in literature, only the essential information is written and the reference is used. If the method is not followed completely, the differences from the original methods are stated clearly. Research frame and/or the progression of the study are described using graph or table if possible. The conditions and order used should be included in the description. In case many people are involved, the distribution of the work can be indicated here. The statistical analyses used are described in this chapter. The computer softwares used for data analysis and graphical softwares used to make figures should be listed in this chapter.

Chapter IV: Results

It presents a systematic and orderly description of findings of the study obtained by the standard methodology and their meaningful analyses either in the form of maps, figures, tables or text. Each of tables or figures must be accompanied closely with the text

highlighting the key information. Results may consist of multiple headings depending on the number of experimental work and/or parametric studies conducted. The tabulation, figures, text presentation should repeat the same findings. The result must be presented briefly in text as far as possible. However, shall be indicated by tables, figures for detail description. Results are presented in logical order using subchapters. Raw data can be presented in appendix, if required. The data given in the figure or table should not be written in the text. The data is given either in figure or in table, not in both. The same result shall not be repeated in all forms (i.e. text, tables and figures). Attention should be paid on the accuracy of the results. The precision of the analysis determines the precision used in the results section. General rule is to use three significant numbers. In general, discussion is not included in results. Sometimes it is hard to distinguish the results from discussion. The discussions that can be concluded directly form the results and do not require further background information from the literature can be presented in the results. In results section no references to the literature are made.

Chapter V: Discussions

This chapter discusses the results of the study in relation to the hypotheses and their scientific interpretations. It highlights the major findings, their significance and implications. Validation and justification of findings/results is done by comparing with relevant findings publishes in previous literatures. Reasoning and logics with major findings should also be discussed. Each of the findings/results may contain discussions depending upon their significance and utility. Discussion is authors' interpretation from his/her results. It also includes comparison to previously

published data. In discussion author gives reader his ideas from the study performed. Author gives his opinions to reader. This is why it is important to make discussion accurate, with expertise. Though discussion includes authors opinions, all the opinions must be based on the results from the work or from the published results by the others. Opinions that are not based on the results should not be presented. In case of short report, results and discussion can be combined. However, this is not recommended, since in his case the risk for superficial discussion is high and not enough the comparison to literature is done. In discussion the order of the subchapters must be considered carefully. In the beginning the possible sources for errors, the evaluation of the methods etc. can be given. After that the most obvious results can be discussed. Finally, the new findings are shown. All the results should be discussed. However, repetition with Chapter results should be avoided. Result can be repeated shortly, a reference is normally enough. Each paragraph includes one result from the study. Since this is already presented in literature review, only the most relevant references are given. There is normally no need for describing the experimental setup. However, if the setup is important when comparing the results, it can be described briefly. After describing the previous knowledge, the result from the work is given in context to the results from the literature. Author should pay attention to following aspects: (1) does the result fit to the results from literature? (2) If not, can author explain why they do not follow the results from literature? (3) What new aspects do the results give? In discussion author should also explain the comparability of the results; if the experimental setups differ and this could explain the difference in the results this must be mentioned. Conclusions from the results are written in the end of the paragraph. Finally author should think the aims of the work

and compare them with the content of the results and discussion. From each aim given, result and discussion from the result should be found. Last paragraph of the discussion is the generalization. A successful study gives new observations and these observations can be generalized to create new theories. These new observations should be stressed in discussion. However, results that confirm the theories from other authors should be also mention, together with possible disagreements. The usability of the results should be explained, especially if the report does not include separate conclusions. Also, if the study rose up some new questions, it should be mentioned. Author should also think how this study contributed to general knowledge from the subject studied. Too speculative or provocative discussion should be avoided. If the report includes separate chapter 'conclusions', this last paragraph of the discussion can only include the key results and the conclusions from them.

Chapter VI: Conclusions and Recommendations

Conclusions:

The Conclusion section generally sums up the key findings and meaning obtained from the research. It should be based on objectives and very much specific. In conclusions and summary the text is condense and no references are given. The length of this chapter is max 1-2 pages. The data of the results not be repeated while writing conclusions. No individual results are given, but the generalization and the importance of the results are explained. Each conclusion is given in separate paragraph. The importance and usability of the results, together with possible applications are explained. The possible effect to studies in future

is speculated. Author should clearly write down those conclusions he/she wants the reader to remember from the study.

Recommendations:

Recommendations include applications of the major findings of the study and specific areas for further research. It should strictly be based on the results or data obtained in the dissertation. Recommendation should be presented in the numbered points in the order of priority.

References

The dissertation should contain appropriate documentation – that is, references to original literature relevant to the research presented in the dissertation. Student should follow the APA system to list the references. In APA system the references are listed in alphabetical order. All the references are given in text in form "name of the author year of publication, e.g. (Smith 1997) or "According to Smith (1997)..." List of references is organized in alphabetical order. If two or more references have same authors, the references are organized by the year of publication. If referred to the publications from the same author published in same year, the references are separated by small letters, e.g. Smith 1997a and Smith 1997b. Names with the prefixes de, do, van, von, etc. will be placed in alphabetical order of the first letter of the prefix, and e.g. Lennart von Post would appear under 'V' as Von Post, Lennart. Where italics are intended, words must either be typed in roman and underlined or printed in italics from a word processor. Abbreviate journal titles according to standard rules.

The List of References should follow the following guidelines.

a. The heading 'References' must appear at the top of the page. The heading must be bold, centered and without punctuation.

b. List of references (literatures) should begin the two spaces after the heading.

c. Arrangement of entries shall be alphabetical by author's surname.

d. Single space within each entry and double space between entries should be given.

e. A single entry must not split over two pages. If an entire entry does not fit on one page, the entire entry is place on the next page.

f. These pages are counted and numbered in Arabic letters.

g. Every reference cited in the text should be listed in the 'Reference' section that follows the main body of the dissertation. Likewise, citation which is not mentioned in the text should not be listed in reference section. This one to one correspondence between citations and listing of references is essential.

1. Journal Article:

- Authors: last name and initial(s) of the first name(s)
- Year of publication
- Title of the article
- name of the journal (or official abbreviation), volume, number, page number of the article

Examples:

Le Fort, P., 1981. Manaslu leucogranite: A collision signature of the Himalaya. A model for its genesis and emplacement. *Journal of Geophysical Research*, v. 86, pp. 10545–10568.

Garzione, C. N., Dettman, D. L., Quade, J., Decelles, P. G., and Butler, R. F., 2000. High times on the Tibetan plateau: paleoelevation of the Thakkhola graben, Nepal. *Geology*, v. 28, pp. 339–342.

2. Book/Chapter of a Book

- Authors and/or editors: last name and initial(s) of the first name(s)
- Year of publication
- Title of the book
- Place of publication: Publisher, edition (if not 1st), total page numbers.
- If referred only to section (chapter) of book, reference is the title of the section/chapter. In this reference includes authors of the section/chapter, title of the chapter, Authors/editors of the book, title of the book, place of publication, publisher, page number of the chapter.

Examples:

Gansser, A., 1964. *Geology of the Himalayas*. Interscience Publication, Wiley, London. 289 p.

Mange, M. A., and Morton, A. C., 2007. Geochemistry of heavy minerals. In: Mange, M. A., Wright, D. T. (Eds.), *Developments in Sedimentology*, pp. 345–391.

Pettijohn, F. J., Potter, P. E., and Siever, R., 1987. *Sand and Sandstone*. Springer, New York. 533 p.

Royden, L. H., and Burchfiel, B. C., 1987. Thin-skinned north-south extension within the convergent Himalayan region: gravitational collapse of a Miocene topographic front. In: Coward, M. P., Dewey, J. F., and Hancock, P. L. (Eds.), *Continental Extensional Tectonics*, Geological Society of London Special Publication, pp. 611–619.

3. Symposia/conference proceedings

- Authors: last name and initial(s) of the first name(s)
- Title of the article
- Editor(s) ; last name and initial(s) of the first name(s)
- Name of the proceeding, volume, year of publication, publisher. Also, information concerning from where the publication can be found, e.g. the organization.

Example:

Price, P. L., 1983, A Permian palynostratigraphy for Queensland. In: *Permian Geology of Queensland: Symposium on Permian Geology of Queensland, Brisbane 1982, Proceedings Geological Society of Australia, Queensland Division*, pp. 155–211.

West, R. M., Dongol, G. M. S., Munthe, J., Hutchinson, J. H. and Gupta, V. J., 1988. Late Neogene and Quaternary Geology, Palaeontology and Palaeoenvironment of the Kathmandu Valley, central Nepal and the Churia Hills, Western Nepal. The Palaeoenvironment of East Asia from the Mid-Tertiary, Proceedings of the Second Conference (Ed. P. Whyte et al.), v. II, pp. 916-936.

4. Thesis/Dissertation/Reports

- Authors: last name and initial(s) of the first name(s) or the organization that made the report
- Name of the report, and identification codes (register number, code, page numbers etc.)
- Publisher, name and number of the series, organization published the report, place of publication, year of publication.

Examples:

Minna V., 2005. Plant macrofossil evidence of changes in aquatic and terrestrial environments in north-eastern European Russia and Finnish Lapland since the late Weichselian. PhD thesis, University of Helsinki, Publications of the Department of Geology, 37 p.

Wipanu, R., 2006. The palaeoenvironment and vegetation change during the Late Quaternary period of southern Thailand from the palynological record. Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in Environment Biology, Suranaree University of Technology, Thailand, 199 p.

5. Publication in the web

Full web information with accessed date should be provided if it used.

Examples:

Hurtado, J., Chatterjee, N., Ramezani, J., Hodges, K., and Bowring, S., 2007. Electron microprobe chemical dating of uraninite as a reconnaissance tool for leucogranite geochronology. Available: <http://hdl.handle.net/10101/npre.2007.655.1> [22 July 2012].

Punt, W., S. Blackmore, S., Nilsson, S., and A. Le Thomas, A., 2004. Glossary of Pollen and Spore Terminology. Available: <http://www.bio.uu.nl/~palaeo/glossary/glos-p5.htm> [22 July 2012].

All the published material is written according to these instructions. Electronic material is reported using the same principles. Electronic material reference must include all the same information as the printed reference. URL address and date is mentioned when referring www pages. Be careful with special symbols.

Appendices

An appendix should include materials that supplement the main text of the dissertation. It may include:

Geological, Hydrological, Engineering geological Maps
Supplementary original data, summary tabulations
Illustrative material

Description of equipment
Description of testing kits
Statistical analysis
Details of the derivation equations
Computer software products/printouts
Other relevant information

Similar material should be gathered in a single appendix

The appendix material should begin two spaces below the heading.
List each appendix and its title separately in the table of contents.
The pages are counted and numbered in Roman letters (I, II, III, IV,).

SECTION V

DISSERTATION SUBMISSION AND EVALUATION PROCEDURE

M. Sc. Geology students shall submit their dissertation not before a month of date of publication of results of the examination of M. Sc. Geology second year. The dissertation can be submitted only two times in a year i.e. until end of June and end of December. The dissertation submitted until end of June will be allowed to give examination in the month of August. While the dissertation submitted from July until December has to wait for examination in February of the next year.

5.1. First draft submission

- a. Two of the dissertation in temporary bound form (spiral or loose binding) should be submitted through supervisor(s) to the HOD.
- b. The dissertation should be certified by the supervisor(s) by signing page of recommendation.
- c. The HOD will approve the dissertation and manuscript on the basis of these guidelines.
- d. If not, the draft dissertation will be returned to the student for necessary amendments and resubmission.
- e. Students must submit a manuscript based on his/her research along with the dissertation. Otherwise the dissertation will not be forwarded for evaluation. The accepted manuscript will be

reviewed by the research committee of CDG and forwarded for publication in the Bulletin of Department of Geology. If any student has already submitted his results for publication in any academic journal, he/she should provide the evidence of it.

5.2. Examination through the open defense and viva-voce

a. The draft copy of the dissertation will be forwarded to Examination Section of Dean's office of Institute of Science and Technology, Tribhuvan University.

b. The Dean's office appoints external examiner from the roster of dissertation examiners prepared and updated as per rule and regulations of the University. The HOD shall appoint an internal examiner from the full time faculty members of CDG.

c. The dissertation copies will be provided to internal examiner and external examiner for evaluation.

d. By the consultation with examiners, the department will publish the date of viva-voce examination through open defense.

e. In general, unless or otherwise in special circumstances, such date of examination will be within a month from the date of approval of the dissertation. However, in general the viva-voce examination shall not be held one week from the date of appointment of external examiner by Dean's office.

f. The viva-voce open defense will be held at CDG unless otherwise stated by the authority. The dissertation defense meeting will be chaired by HOD, external and internal examiners

will be present during the meeting. Concerned authority of Tribhuvan University may be called as an observer.

5.3. Evaluation

The dissertation proposal and dissertation will be evaluated on the basis of this guideline. The dissertation will be evaluated after the open defense by the board of examiners (external and internal examiners, Head of the Department and supervisors and at least one full time faculty member of Geology). The evaluation scheme will be data collection, analysis and interpretation of results, write up (language and skills), dissertation presentation and viva voce. The examiner(s) shall send the evaluation report to the Examination Section of Dean's office of Institute of Science and Technology of Tribhuvan through HOD.

5.4. Final Submission

a. If the dissertation is rejected with major errors either in methodology or data results, resubmission should be done within 3 months of the examination date. In the case of minor corrections the final dissertation should be submitted within one month of the examination date.

b. After correction and signing, at least three copies of hard bound final copies along with the soft copy of the dissertation in CD either in MS Word or PDF format should be submitted to the CDG.

c. From the submitted copies of final dissertation, the CDG will send two copies to the Examination Section of Dean's office, Institute of Science and Technology, Tribhuvan University along

with evaluation marks and one copy of dissertation from the received copies of IOST will be collected by CDG for documentation at its departmental library.

d. Thesis will be uploaded in tugeology.edu.np website so submission of PDF is compulsory.

Appendix-I

TITLE OF THE DISSERTATION
(12 pt. font)

A Dissertation Submitted to the
CENTRAL DEPARTMENT OF GEOLOGY
TRIBHUVAN UNIVERSITY
Kirtipur, Kathmandu
NEPAL

In Partial Fulfillment of the Requirement for the Award of Degree
of Master of Science in Geology/Engineering Geology

By
Name of the Student (UPPER CASE)
Year of Submission
Exam Roll No.
TU Registration No.

© Tribhuvan University

Appendix-II

CENTRAL DEPARTMENT OF GEOLOGY
TRIBHUVAN UNIVERSITY
Kirtipur, Kathmandu
NEPAL

Date:

RECOMMENDATION

This is to certify thathas completed this dissertation work entitled..... as a partial fulfillment of the requirements of M. Sc. degree in Geology/Engineering Geology under my supervision. To my/our knowledge this work has not been submitted for any other degree.

.....
Name and signature of the Supervisor
Designation

Appendix-III

CENTRAL DEPARTMENT OF GEOLOGY
TRIBHUVAN UNIVERSITY
Kirtipur, Kathmandu
NEPAL

Date:

LETTER OF ACCEPTANCE

On the recommendation of the supervisor (s)
.....the dissertation work of
..... is accepted for the examination and
is submitted to the board of examination for the partial fulfillment
of the requirements of M. Sc. degree in Geology/Engineering
Geology.

.....
Head of the Department
Central Department of Geology
Tribhuvan University

Appendix-IV

CENTRAL DEPARTMENT OF GEOLOGY
TRIBHUVAN UNIVERSITY
Kirtipur, Kathmandu
NEPAL

BOARD OF THE EXAMINERS

Recommended by:
Full Name (Supervisor)

Examined by:
External Examiner

Examined by:
Internal Examiner

Accepted by:
Full Name (Head of the Department)

Date:.....

M. Sc. GEOLOGY
and ENGINEERING GEOLOGY
DISSERTATION GUIDELINE

Published by:

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Tribhuvan University

Kirtipur, Kathmandu, NEPAL

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