# GRADUATION THESIS

## CONTENT, FORMAT, AND STYLE GUIDELINES FOR STUDENTS

GRADUATION THESIS COORDINATION COMMITTEE
FACULTY OF PHARMACY - GAU

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# THE “SCIENCE” CONCEPT

# The Meaning and Nature of "Science"

- **Science** is the intellectual and practical activity encompassing **the systematic study** of **the structure and behaviour** of the physical and natural world and **the knowledge that we obtain** about them through **observation and experiment**.

# Scientific Thinking

- Scientific Thinking refers to both thinking about the content of science and the set of reasoning processes that permeate the field of science:

Experimental design, causal reasoning, and hypothesis testing.

# Scientific Research Design

- Scientific Research Design refers to the overall strategy to integrate the different components of the scientific research in a coherent and logical way.

# Scientific Methodology

- Scientific Methodology is the general research strategy that outlines the way in which a research project is to be undertaken and, among other things, identifies the methods to be used in it.

# Scientific Research Methods

- Scientific Research Methods include all the techniques and methods which have been taken for conducting research.

- Scientific Research Methods are the tools and techniques for doing scientific research.

# RESEARCH ETHICS, ACADEMIC INTEGRITY (HONESTY)

## SCIENTIFIC MISCONDUCT and PLAGIARISM

# Scientific Ethics

- Scientific Ethics is defined as the "Standards of Conduct" for Scientists in their professional work.

- The basic universal ethical values, which are the foundation of the integrity and credibility of science, refer to the representatives of all disciplines of science.

# Research Ethics

- The term "Research Ethics" refers to a wide variety of values, norms, and institutional arrangements that help constitute and regulate scientific activities.

# Research Ethics (cont.)

- It also implies duties of honesty, integrity, objectivity, accountability and openness alongside thoughtful inquiry, rigorous analysis, and the application of professional standards.

# Scientific Misconduct

- Scientific Misconduct is defined as "Intention or gross negligence leading to fabrication of the scientific message or a false credit or emphasis given to a Scientist" and includes, besides plagiarism, data manipulation (falsification) and fabrication.

# Plagiarism

- Plagiarism means using the work of others in preparing an assignment and presenting it as your own without explicitly acknowledging, or referencing where it came from.

- Plagiarism is a type of “intellectual theft”.

# THESIS

# Thesis

- A Thesis is a long essay or dissertation involving personal research, written by a candidate for a University Degree.

- A Thesis is a document submitted in support of a candidate for an Academic Degree or Professional Qualification presenting the author's research.

# GRADUATION THESIS

# Graduation Thesis

- A Graduation Thesis is the documentation of your original research or scholarship that serves as partial completion of graduation requirements.

# GRADUATION THESIS

# RESPONSIBILITIES OF THE STUDENT

# Responsibilities of The Student

- Maintaining excellent communication with your Thesis Supervisor
- Scheduling regular meetings with your Thesis Supervisor
- Submitting a review of the relevant literature at an early stage

# Responsibilities of The Student (cont.)

- Preparing the Graduation Thesis Proposal
- Writing the Graduation Thesis in accordance with academic standards and scientific writing guidelines
- Submitting the Graduation Thesis by the agreed deadline

# GRADUATION THESIS

## TASKS OF
## THE STUDENT

# Tasks of The Student

- Topic selection
- Literature search and critical evaluation
- Formulation of the problem statement, research question(s), hypothesis, aim(s) and objective(s) of the research
- Preliminary choice of methodology and rationale for the choice

# Tasks of The Student (cont.)

- Identification of the research instruments, the scope and explanation of the data collection procedures
- Compilation of the list of references needed for the Thesis
- Development of the detailed planning calendar for implementing the research
- Preparation of the Thesis Proposal

# Tasks of The Student (cont.)

- Preparation of the first draft of "Introduction" and "Literature Review" Sections
- Data collection
- Completion of the "Results" Section
- Writing of the "Conclusions" (and "Recommendations") Sections
- Writing the "Summary" Section

# GRADUATION THESIS

# SUPERVISOR

# Graduation Thesis Supervisor

- You will be supported by an Academic Supervisor (Graduation Thesis Supervisor) through the entire Graduation Thesis process.

# Graduation Thesis Supervisor (cont.)

- The Thesis Supervisor is there to facilitate and not to lead, hence the responsibility for the quality and content of a dissertation is entirely that of yourself, the Student!

# GRADUATION THESIS ROADMAP

# Graduation Thesis Roadmap

- Graduation Thesis consist of two Courses, namely Thesis Proposal and the Theoretical Part of the Thesis in the 9th Semester and Conducting the Research Phase and Thesis Writing in the 10th Semester.

- The Graduation Thesis should be realizable within two semesters.

# GRADUATION THESIS
# PROCESS STEPS

# Graduation Thesis Process Steps

. Assigning  Students to Supervisors and Projects / Topic Selection
. Framing The Student / Supervisor Roles and Responsibilities
. Planning The Thesis Timeline / Calendar of Due Dates (Steps - Tasks - Timetable)
. Research Problem & Research Question
. Literature Search and Criticle Evaluation

# Graduation Thesis Process Steps (cont.)

. Hypothesis Formulation
. Identifying Appropriate Research Methodology (Research Design)
. Graduation Thesis Proposal Preparation
. Graduation Thesis Proposal Acceptance
. Effectively Carrying Out The Graduation Thesis (Conducting The Research Phase)

# Graduation Thesis Process Steps (cont.)

. Graduation Thesis Progress Supervision (Student - Thesis Supervisor Meetings)
. Graduation Thesis Progress Monitoring
. Structuring The Graduation Thesis (Format and Style)
. Writing the Graduation Thesis (Scientific Writing)

# Graduation Thesis Process Steps (cont.)

. Defending The Graduation Thesis
. Graduation Thesis Evaluation
. Poster Presentation
. Dissemination of the Graduation Thesis Findings

# GRADUATION THESIS
# TIME FRAME

# Graduation Thesis Time Frame

- Timetable - Semester 9, by week

1 2 3 4 5 6 7 8 9 10 11 12 13 14

- Timetable - Semester 10, by week

1 2 3 4 5 6 7 8 9 10 11 12 13 14

# GRADUATION THESIS PROPOSAL

# Graduation Thesis Proposal

- The Graduation Thesis Proposal is a brief document that contains an outline plan for a research project.

- It is produced at the beginning of the research process in advance of any data collection.

# Graduation Thesis Proposal (cont.)

- The Graduation Thesis Proposal should be at least 2.000 words in length (which is equivalent to approximately 7-8 pages).

- The Graduation Thesis Proposal should contain all the key elements involved in the research process.

# Graduation Thesis Proposal (cont.)

- The Graduation Thesis Proposal must be capable of convincing the Evaluation Committee about the credibility, achievability, and reproducibility (repeatability) of the research design.

# Graduation Thesis Proposal (cont.)

- The Graduation Thesis Proposal must address the following questions:
  - What you plan to accomplish
  - Why you want to do it
  - How you are going to do it

# The Key Components of a Graduation Thesis Proposal

. Title
. Problem
. Significance
. Background
. Hypothesis
. Aims & Objectives

# The Key Components of a Graduation Thesis Proposal (cont.)

. Ethics
. Methodological Approach
(Data Collection and Analysis Methods)
. Time Frame
. References

# RESEARCH APPROACHES

# Research Approaches

- Quantitative Research
- Qualitative Research
- Basic (Fundamental) Research
- Applied Research
- Deductive Research
- Inductive Research

# TYPES
# OF RESEARCH

# Types of Research

- Exploratory Research
- Conclusive Research
- Descriptive Research
- Analytical Research

# SCIENTIFIC RESEARCH PROCESS

# Scientific Research Process

- Scientific research is a process consisting of the identifying and defining the research problem, testing the hypothesis through data collection, reaching of conclusion from the test results of the hypotheses, and evaluating and reporting the research.

# Scientific Research Process (cont.)

1) Determining the Research Topic
2) Effective Literature Search and Critical Evaluation of the Literature
3) Framing the Research Problem and Research Question
4) Developing Hypothesis
5) Identifying the Research Design and Research Methodology

# Scientific Research Process (cont.)

6) Formulating the Sample Size and Sampling Technique
7) Collecting the Data
8) Data Analysis
9) Hypothesis Testing
10) Preparation of the Research Report (Scientific Writing) and Presentation

# RESEARCH TOPIC SELECTION

# Research Topic Selection

There are three factors which a researcher needs to consider in choosing a research topic:

1) Interest of the researcher
2) Researcher's competence
3) The relevance and usefulness of the topic

# Research Topic Selection (cont.)

- Your Graduation Thesis should present either new information on a subject or a fresh analysis of existing data
- The topic should be specific enough to be manageable but general enough to stimulate further research
- You should not embark on a project for which you lack the necessary time and/or other resources

# RESEARCH PROBLEM

# Research Problem

- A research problem might be defined as the issue that exists in the literature, theory, or practice that leads to a need for study or further study.

# Research Problem (cont.)

- A research problem could present itself as a condition to be improved upon, a difficulty or deficiency to be overcome, or a gap in knowledge that exists in literature that is to be filled, or theory that requires meaningful understanding.

# RESEARCH QUESTION

# Research Question

- Research question is at the center point of any scientific research.
- Research question refers to "what is it you are trying to find out?"

# Research Question (cont.)

- The research question should be specific enough to state the research hypothesis.
- In order to develop the research design, the research topic has to be changed to a research question.

# LITERATURE SEARCH

# Literature Search

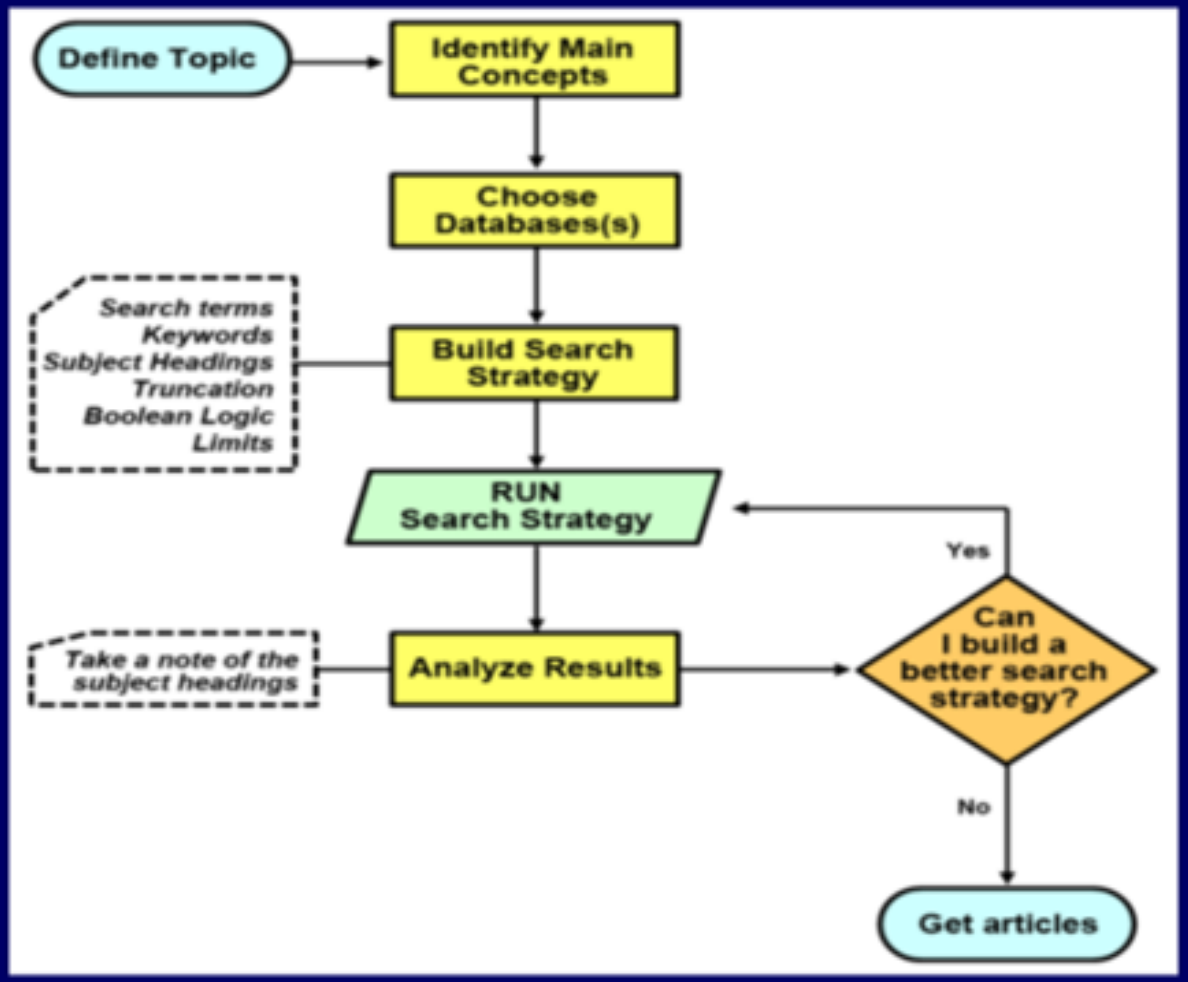
- A literature search is a methodical search for all of the literature published on a topic.

- Systematic literature review is a means of identifying, evaluating and interpreting all available literature relevant to a particular research question, or topic.

# Literature Search Strategy

. Define the topic
. Identify the type(s) of literature
. Select information source(s) to search
. Decide the keywords (search terms)
. Determine the search tool(s)
(e.g. a search engine, a database)
. Utilize search technique(s)
. Evaluate the results

# Literature Search



# Literature Sources

. Primary Sources

. Secondary Sources

. Tertiary Sources

# Literature Sources (cont.)

. Peer-reviewed Journals
. Databases (references to journal articles)
. Theses and Dissertations
. Books
. Internet Sources

# Literature Search Techniques

. Quotation Marks (“”)

. Boolean Operators ( AND / OR / NOT )

. Snowballing (Chaining, Reference Harvesting, Pearl Growing)

. Limiters (Filters)

# LITERATURE EVALUATION

# (CRITICLE APPRAISAL OF "EVIDENCE")

# Literature Evaluation

- Criticle appraisal of “evidence” is a process of assessing the “evidence” by systematically and carefully considering its reliability, validity and relevance to the area considered.

# Literature Evaluation (cont.)

Critical appraisal of "evidence" is reviewing each study to determine:

. Its level of evidence

. How well it was conducted

. How useful it is to practice

# Literature Evaluation Checklist

. The Journal
. The Article
. The Researcher(s) / Author(s)
. Literature Review
. Research Problem and Research Question
. Research Methodology and Methods
. Results and Statistical Tests
. References

# RESEARCH HYPOTHESIS

# Research Hypothesis

- A research hypothesis is a statement that can be tested, i.e. translation of theory into a testable statement.

- The importance of hypotheses lies in their ability to bring direction, specificity and focus to a research study.

# Research Hypothesis (cont.)

- The research hypothesis is a specific, clear, and testable proposition or predictive statement about the possible outcome of a scientific research.

- It is a formal statement that presents the expected relationship between an independent and dependent variable.

# Null Hypothesis ("Ho" or "No-Difference" Hypothesis)

- The Null Hypothesis is a statement that a relationship expected in the research hypothesis does not exist.

- The Null Hypothesis is a type of hypothesis used in statistics that proposes that no statistical significance exists in a set of given observations.

# SCIENTIFIC RESEARCH DESIGN

# Scientific Research Design

- Scientific Research Design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data.

# Scientific Research Design (cont.)

- Decisions regarding "what?", "where?", "when?", "how?", and "by what means?" concerning a research study constitute a research design.

# Scientific Research Design (cont.)

- The Sampling Design
- The Observational / Experimental Design
- The Statistical Design
- The Operational Design

# Scientific Research Design (cont.)

1. The nature of the study
2. The purpose of the study
3. The location where the study would be conducted
4. The nature of data required
5. From where and how the required data can be collected

# Scientific Research Design (cont.)

6. What time period the study would cover
7. The type of sample design
8. The techniques of data collection
9. The methods of data analysis
10. The manner in which the report would be prepared and presented

# SCIENTIFIC RESEARCH METHODS

# Scientific Research Methods

- Experimental Studies
- Surveys

  - Descriptive Surveys
  - Analytical Surveys

# STATISTICS
# AND
# STATISTICAL ANALYSIS
# IN
# SCIENTIFIC RESEARCH

# Statistics

- Statistics is used to summarize, analyse, and interpret a group of numbers or observations.

# Sampling

- All items in any field of inquiry constitute a 'Universe' or 'Population'.
- Sampling is a definite plan for obtaining a sample from a given population.
- It refers to the technique the researcher would adopt in selecting items for the sample.

# Sample and Sample Size

- A 'sample' is defined as a set of selected individuals, items, or data taken from a population of interest ("target population", "universe").

- Sample Size refers to the number of items to be selected from the "universe" to constitute a sample.

# Sample and Sample Size (cont.)

- The Sample and Sample Size must be such that the results of the sample study would be applicable to the 'universe' ('population of interest', 'target population') at a reasonable level of confidence

# Probability Sampling

- Probability sampling is based on random selection.

- For a design to be called probability sampling or random sampling (chance sampling), it is imperative that each element in the "population" has an equal chance of selection in the sample.

# Probability Sampling Tehniques

- Simple Random Sampling
- Systematic Sampling
- Stratified Sampling
- Cluster Sampling

# Descriptive Statistics

- Descriptive Statistics are used to describe the basic features of the data in a study.

- They provide summaries about the sample and the measures.

# Descriptive Statistics - Measures of Central Tendency

- Mean
- Median
- Mod

# Descriptive Statistics - Measures of Variability

- Range
- Variance
- Standard Deviation (SD)

# Descriptive Statistics - Measure of Association

- Correlation Coefficient

The most common correlation coefficient is Pearson's r, which can range from -1 to +1

# Statistical Analysis

- Statistical Analysis helps in hypothesis testing to determine whether observed differences between groups or variables are real or occur simply by chance.

# Statistical Tests - Parametric Tests

. (Student's) t Test

. One-way ANOVA

# Statistical Tests - Non Parametric Tests

. Mann-Whitney U Test
. Wilcoxon Signed Rank Test
. Kruskal-Wallis Test
. Chi-Square Test
. Kolmogorov-Smirnov Test

# Significance Levels

- Traditionally, researchers have used either the 0.05 level (the 5% level) or the 0.01 level (the 1% level).

- If the probability (p-value) is less than the significance level, then the Null Hypothesis is rejected and the result (the outcome of research) is said to be statistically significant.

# Significance Levels (cont.)

- "p-value" is a measure of probability.
- If the p-value is less than 0.05 ($p<0.05$), it means that the probability that the result was due to chance is less than 5 % (a "statistically significant" result).

# STRUCTURING THE GRADUATION THESIS

# Divisions and Sections of The Graduation Thesis

- Preliminary Material (Preliminary Pages)
- Body of Thesis (Text Pages)
- Supplementary Pages

# Preliminary Material (Preliminary Pages)

. Title Page
. Acknowledgements
. Ethical Declaration Page
. Table of Contents
. List of Tables
. List of Figures
. List of Appendices
. List of Abbreviations
. Abstract

# Body of Thesis (Text Pages)

. Introduction
. Literature Review (sometimes included in the "Introduction" Section)
. Methodology, Materials and Methods
. Results (Outcomes)
. Discussion
. Conclusion
. Recommendations (sometimes included in the "Conclusion" Section)

# Supplementary Pages

. References (Literature, Bibliography)

. Appendices

# Order of Thesis Writing

Methods

↓

Results

↓

Discussion

↓

Conclusions

↓

Introduction

↓

Abstract

# FORMATTING
# and
# STYLE
# GUIDELINES

# Formatting and Style Guidelines

. Paper
. Printing and Printing Quality, and Duplicating
. Word Length (Word Count)
. Page Size and Page Format
. Pagination (Page Numbering)
. Margins (Top, Bottom, Left, Right)
. Font Type and Font Size
. Spacing and Line Spacing

# Formatting and Style Guidelines (cont.)

. Chapters / Sections and Subheadings
. Paragraphs
. Tables and Figures
. Numbers
. Abbreviations

# GRAMMAR in THESIS WRITING

# Grammar in Thesis Writing

. We / I
. Passive / Active Voice
. Tenses
. Contractions
. Imprecise Words
. Linking Words (Conjunctions)
. Spelling

# GRADUATION THESIS
# CHECKLIST

# Graduation Thesis Checklist

- Assess your Graduation Thesis in the following areas:
  - o Content
  - o Structure
  - o Format / Style

# Graduation Thesis Checklist (cont.)

- Have you checked that the presentation of your Graduation Thesis meets Content, Format, and Style Guidelines of GAU School of Pharmacy?

- Have you received your Thesis Supervisor's feedback on the final draft?

# GRADUATION THESIS

# PROOFREADING

# Proofreading (Cheching for Mistakes)

- Careful proofreading for grammar, punctuation, spelling and general consistency is essential.

- Check the spelling of all words in your Graduation Thesis, including those in your bibliography, using a good spellingchecker.

# GRADUATION THESIS
# SUBMISSION

# Graduation Thesis Submission

- Three hard copies of the dissertation, written in the approved manner, together with a copy on CD-Rom (using MS Word format) should be submitted to the Dean's Office of GAU School of Pharmacy.

# Graduation Thesis Submission (cont.)

- The Graduation Thesis submission deadline will be strictly observed.

- One of the learning aims of the Graduation Thesis is to demonstrate the ability to manage a complex piece of scientific work within the available time frame.

# Graduation Thesis Resubmission

- In case of an initial fail, the extent of improvements that will be allowed for resubmission are minor editorial corrections to the dissertation.

- Where a dissertation has major deficiencies then no further revisions will be permitted.

# We Wish You All
# A Successful
# Graduation Thesis Process