Pokhara University
Faculty of Science and Technology

Course No.: CMP 270	Full marks: 100
Course title: **Research Fundamentals (2-0-2)**	Pass marks: 45
Nature of the course: Theory & Practical	Total Lectures: 45 hrs
Level: Bachelor	Program: BE (Computer, IT and Software)

1. Course Description

This course is designed to develop the skills of students to do a project/research work using the fundamental concepts of research. This course introduces what the research or project work is, explores in brief how it is done, explains what research ethics must be followed during the research/project work and finally guides the students how the research/project documentation is done in the form of the proposals report and final research/project report.

2. General Objectives

- To acquaint the students with basic knowledge of research/project work.
- To develop the skills in students to conduct research/project work.
- To develop the skills in students to work in a team.
- To develop the skills in students to write an impressive proposal report and final research/project report and present their work orally.
- To acquaint the students with the knowledge of research ethics.

3. Methods of Instruction

Lecture, Discussion and Project work.

4. Contents in Detail.

Specific Objectives	**Contents**

● Understand the basic concepts of research, purpose and outcomes of a research/project work.	**Unit 1: Introduction (4 hrs)** 1.1 What is research? 1.2 Research Aim and Objectives 1.3 Features of Research 1.4 Types of Research 1.5 The 6Ps of Research 1.6 Purpose of Research- reasons for doing research 1.7 Product of Research- outcomes of research 1.8 Research versus Project
● Understand and implement the research process model to conduct a research/project work.	**Unit 2: Research Process Model (10hrs)** 2.1 Personal Experiences and Motivation 2.2 Literature Review 1. Purpose and objectives of a literature review 2. Literature resources 3. Conducting a literature review 4. Citation and its types 5. Bibliographic Detail and Referencing Systems 6. Plagiarism 2.3 Research Question 2.5 Conceptual framework 2.5 Strategies 1. Survey 2. Design and Creation 3. Experiment 4. Case Study 5. Action Research and 6. Ethnography 2.6 Data Generation Methods 1. Interview 2. Observations 3. Questionnaire 4. Documents 5. Types of triangulation in a research project 2.7 Data Analysis 1. Quantitative and 2. Qualitative data analysis
● Familiarize with the laws and ethics in research conduction.	**Unit 3: Participants and Research Ethics (4hrs)** 3.1 Participants 3.2 The law and Research 3.3 Rights of People Directly Involved 3.4 Responsibilities of an Ethical Researcher

● Familiarize with the research proposal and its components. ● Develop a research/project proposal.	**Unit 4: Proposal Writing (6hrs)** 4.1 What is a research proposal? 4.2 Need of a Research Proposal 4.3 Components of a Research Proposal 1. Title 2. Abstract 3. Keywords 4. Rationale/background and motivation 5. Aim and objectives of research 6. Literature review 7. Research problem 8. Methodology 9. Research plan and budget 10. Contributions- impact and significance 11. Reference list/bibliography 12. Annexes 4.4 A case study on any research/project proposal report
● Familiarize with the research/project report and its components. ● Develop a research/project report.	**Unit 5: Report Writing (6hr)** 5.1 What is a research report? 5.2 Need of a Research Report 4.3 Components of a Research Report 1. Title 2. Abstract 3. Introduction a. Rationale/background b. Problem and motivation c. Aim and objectives of research d. Significance of research e. Scope of research f. Limitation 4. Literature review 5. Research problem and Solution 6. Methodology a. Research design b. Participants c. Data collection methods d. Data analysis techniques e. Ethical considerations f. Validation Techniques 7. Data Analysis and Findings 8. Discussions and Conclusion 9. Contributions and Future Works

	10. Reference list/bibliography 11. Annexes 4.4 Other Parts of Research Report 1. Funding and Acknowledgement 2. Table of Contents, List Figures, List of Tables and Abbreviations 3. Title Page and Copyright Page 4. Declaration and Recommendation 5. Certification Page 4.5 A case study on any research/project report

5. Practical Work

Laboratory works of 30 hours per group of maximum 24 students should cover all the concepts of research fundamentals studied in the lectures. Students must find a new problem, write a proposal, solve the problem as their project/research work and submit a final project/research report and present their work orally. The marks for the practical work will be based entirely on their project/research work. The entire project/research work shall be divided into two phases and evaluation shall be done accordingly:

Phase I:

- The students are grouped in teams each containing at most 4 students.
- Each team chooses a problem to solve as their project/research work and they work in a team.
- They must define clearly what the problem is, justify why they choose the problem and how they will solve it and submit this as a proposal report (based on Unit 2 and 4).
- Each team presents their proposal orally.

Phase II:

- After the approval of their proposal, they start working on the project.
- Each team follows the research process studied in Unit 2 to do their project/research work.
- Students keep reporting their progress about the project/research work to their instructor.
- Students complete the project/research work, develop the final project/research report (based on Unit 2 and 5) and again present it orally.

6. **Evaluation system**

Internal Evaluation	**Weight**	**Marks**	**External Evaluation**	**Marks**
Theory		30		
Attendance & Class Participation	10%			
Assignments	20%			
Presentations/Quizzes	10%			

Internal Assessment	60%		Semester-End examination	50
Practical (Project/research Work)		20		
Proposal Report	20%			
Project Presentation	20%			
Final Project Report	50%			
Completeness of Project	10%			
Total Internal		50		
Full Marks: 50 + 50 = 100				

7. Student Responsibilities:

Each student must secure at least 45% marks separately in internal assessment and practical evaluation with 80% attendance in the class in order to appear in the Semester End Examination. Failing to get such a score will be given NOT QUALIFIED (NQ) to appear for the Semester-End Examinations. Students are advised to attend all the classes, formal exam, test, etc. and complete all the assignments within the specified time period. Students are required to complete all the requirements defined for the completion of the course.

8. Prescribed Books and References

1. Oates, B. J., Griffiths, M., & McLean, R. (2022). *Researching information systems and computing*. Sage.
2. Walia, A. M., & Uppal, M. (2020). *Fundamentals of Research.* Notion Press.