



**\Department of Mathematics and Computer Science**  
 College of Science  
 University of the Philippines Baguio

## SYLLABUS

### A. COURSE DETAILS

Course Number:	Math 199
Course Name:	Research in Mathematics
Course Description:	The nature of research in mathematics, technical writing, ethics in research, preparation of thesis proposal, review of related literature for thesis.
Credit Units:	3 units
Prerequisite:	COI
Requirements:	Quizzes, Exercises and other minor written outputs 30%
	Review of Literature 30%
	Thesis Proposal Presentation 20%
	Research Paper/Thesis proposal 20%
Passing Grade:	60%

### B. COURSE OUTCOMES

At the end of this course, the student will

- CO1: Explain the nature of mathematics research and mechanics of the mathematics research process;
- CO2: Identify the 'Dos and Don'ts' in writing a scientific/mathematics research;
- CO3: Choose scientific articles significant to his/her chosen research topic; and
- CO4: Develop his/her research skills and technical knowledge in preparation for the conduct of research in mathematics; and
- CO5: Write a research paper or thesis proposal.

### C. COURSE OUTLINE

Timeline	Course Outcome	Topics	Assessment Tools
Weeks 1 – 2	CO1 CO2	<b>The Nature of Research and Mathematics Research</b> 1. Definition of research and mathematics research 2. Characteristics of research 3. The art and science of scholarship 4. Skills and tools for university – level and advanced research 5. The ethics of research 6. Ethics in research in mathematics and allied fields	Quizzes, Reflection essay

Weeks 3 – 6	CO1 CO2 CO4	<b>How to Write Mathematics</b> 1. The Basics: Combining words and equations 2. Applying rules of grammar in mathematics 3. Putting mathematical ideas into writing 4. Writing for your audience 5. Using pictures in mathematics	Quizzes, Paper using Latex software
Weeks 7 – 8	CO1 CO2 CO3 CO4	<b>Research in Mathematics</b> 1. Research in Algebra 2. Research in Analysis 3. Research in other fields of mathematics	Submission of sample articles in different areas of mathematics
Weeks 9 - 10	CO1 CO4	<b>Methods, Approaches and Research Design in Mathematics Researches</b> A. Areas of research in mathematics and allied fields B. The Data: selection, collection, organization, and presentation C. Choosing and applying the appropriate methods, tools, techniques and critical approaches	Written discussion outputs
Weeks 11 – 14	CO2 CO3 CO4	<b>Research in Mathematics</b> A. Types of Research in mathematics B. Reviewing the literature for chosen topic	Written outputs; Literature review
Weeks 15 – 16	CO5	<b>Research Paper/Thesis Proposal Submission and Presentation</b>	Presentation; Paper

#### D. REFERENCES

#### E. CLASS RULES

1. The University rule on class attendance (Article 346 of the University Code) shall be strictly enforced.
2. If a student misses a short quiz, his/her grade in that quiz is zero. If a student misses a long examination for a valid reason (this requires documentation), his/her final grade in the final exam will also account as his/her grade for the missed exam. This applies to no more than one long exam missed. A student who fails to take any examination for invalid reasons will get a grade of 0% for that exam.
3. Cheating, in any form, will not be tolerated.

#### F. RUBRIC FOR ASSESSMENT

##### A. Proving

CRITERIA	Unacceptable 0	Poor 1	Basic 2	Fair 3	Acceptable 4	Exemplary 4
<b>Interpretation of the Problem 30%</b>	Incorrect interpretation of problem. A major misinterpretation	There is at least some sign of relevant ideas	Correct but incomplete interpretation	Correct but with major incorrect or unnecessary	Correct but with minor incorrect or	Correct statement with the hypothesis (given)

		ion of what is given or what is to be shown.	regarding the problem.	on of the problem.  *May overlook significant details in the statement of the problem. Might be stated for indirect proof but a direct proof is given or vice-versa.	concepts for its solutions.	unnecessary concepts for its solutions.	and conclusion (to show) clearly stated.
<b>Correctness of Proof 70%</b>	Mainly incorrect consequences Improperly deduced from the given. Little or no sense of how to prove the result.	Unconnected, mostly true statements properly deduced from the given. Listing facts without a sense of how to link them to get a correct proof. May just jump to the conclusion without justification.	Statements linked into a reasonable (though perhaps misguided) attempt to prove the theorem. The proof may be left incomplete or may depend upon a major Unjustified leap.	A correct approach to proving the theorem is attempted but with major incorrect use of mathematical concepts.	A correct approach to proving the theorem is attempted. Some statements may be unjustified or improperly justified, but errors are minor and could be fixed without substantially changing the proof.	A correct and complete proof is given. Some irrelevant information may be included, particularly on timed work where the student is unable to polish up the presentation.	

**B. Reporting**

<b>Criteria</b>	<b>Needs Improvement 1</b>	<b>Satisfactory 2</b>	<b>Good 3</b>	<b>Exemplary 4</b>
<b>Organization 10%</b>	Audience cannot understand presentation because there is no sequence of information.	Audience has difficulty following presentation because student jumps around.	Student presents information in logical sequence which audience can follow.	Student presents information in logical, interesting sequence which audience can follow.
<b>Content Knowledge 50%</b>	Students shows no understanding of mathematical concepts within the presentation	Students are visibly uncomfortable with the mathematical concepts of the presentation	Students are at ease with the mathematical concepts of the presentation but lack a deep conceptual understanding	Students demonstrate a complete and comprehensive understanding of the mathematical concepts in the presentation

	<b>Visuals 10%</b>	Students use no visuals	Students occasionally use visuals that rarely support the presentation and audience understanding	Students use visuals that are related to the presentation but did not completely support audience understanding	The visuals used supported audience understanding
	<b>Mechanics 10%</b>	Students presentation contained four or more spelling, grammatical or mathematical errors	Presentation had three spelling, grammatical or mathematical errors	Presentation had no more than two spelling, grammatical or mathematical errors	Presentation had no spelling, grammatical or mathematical errors
	<b>Delivery 20%</b>	Student mumbles, incorrectly pronounces terms, and speaks too quietly for students in the back of class to hear.	Student incorrectly pronounces terms. Audience members have difficulty hearing presentation.	Student's voice is clear. Student pronounces most words correctly.	Student used a clear voice and correct, precise pronunciation of terms.