

Guidelines for M.S. and Ph.D. Degree Programs
Department of Mining and Metallurgical Engineering (MME)
Mackay School of Earth Sciences and Engineering,
College of Science-University of Nevada, Reno

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I. Introduction

Welcome to the graduate programs offered by the Department of Mining and Metallurgical Engineering (MME) at the University of Nevada, Reno! MME offers separate M.S. program in Mining Engineering and Metallurgical Engineering and a Ph.D. program in Mineral Resource Engineering. The Ph.D. program is an interdisciplinary program having three areas of concentrations: mining engineering, metallurgical engineering and geological engineering. The first two concentration areas are administered by MME, whereas the last one is administered by Department of Geological Sciences and Engineering. Each graduate program is overseen by a separate Program Director.

We hope this handbook will help you to navigate through our graduate programs. You need to be aware of department policies that have to be followed until your graduation. This handbook is a supplement to the Graduate Student Association (GSA) Handbook, which details the policies of the UNR Graduate School. The GSA Handbook documents University standards for course work, thesis preparation, and publication. It presents, in detail, the steps necessary for successful completion of graduate studies at UNR. The UNR Graduate School is ultimately responsible for both admitting graduate students and approving the completion of their graduate programs. However, in some instances, the Graduate School defers certain decisions to individual Departments. This Guide is intended to codify the pertinent policies of the MME Department toward its graduate programs. In addition, the faculties in MME advise or work with students from interdisciplinary graduate programs, such as Hydrologic Sciences. All UNR interdisciplinary graduate degree programs have assigned graduate Directors. Due to the interdisciplinary nature of these degree programs, policies and procedures may differ from those presented in this document. Information and guidance on policies and procedures for graduate students enrolled in these programs can be obtained from the interdisciplinary graduate Directors. The materials summarized here regarding Graduate School requirements closely match the other engineering programs and is drawn from the Guide of the GSA Handbook.

II. Graduate Program Director

To assist graduate students in their degree programs, the Graduate Program Director is responsible for knowing which students are in the program, their status, and what their plans are with regard to completion of their degrees. The success of this task relies on communication; please let the Director know who you are when you arrive, and keep him/her abreast of any changes in your plans.

The Graduate Program Director's job includes helping new students meet and match interests with faculty, supplying information regarding policies and updates, and on departmental assistantships. Feel free to discuss any issues relating to our graduate programs with this individual.

The Graduate Program Director will also enforce Graduate School and Departmental guidelines and deadlines. The Director will attempt to mediate any problem that may arise between students and advisory/examining committee members. The first resort of a student in difficulty with the committee and/or advisor is the Graduate Program Director. Unresolved matters are referred to the department chair, and if appropriate, the graduate school for action.

III. General University and Departmental Requirements for an Advanced Degree at UNR

Graduate students enrolled in both the M.S. or Ph.D. programs in the Department of Mining and Metallurgical Engineering are obliged to comply with the requirements of both the Graduate School and the Department. As in most other universities, it is the sole responsibility of the *student* to become aware of all policies, procedures, and deadlines appropriate to their degree program. All graduate students need to consult their advisors and to check the latest updates on policies. A visit to the Graduate School in the Student Services Building in the first semester of graduate work is strongly recommended to secure copies of the GSA Handbook and all for M.S. that will eventually be needed by the student.

Annual registration - The UNR Graduate School requires that *students must register for at least three credit hours each semester* or obtain a written leave of absence approved by the student's advisor and the Department chair. Please note that unless these approved leaves are in the Graduate School's records (that is, recorded on the Program of Study), extensions of the 6- and 8-year requirements for M.S. and Ph.D. degrees will not be approved by the graduate dean.

Major Advisor and Committee - An approved application for graduate standing lists the name of the student's temporary Advisor. Usually the temporary Advisor becomes the student's permanent Advisor through the completion of Program of Study paperwork (Graduate School form) during the first committee meeting. The student also selects members of the Advisory-Examining Committee, who are recorded on and sign the Program of Study. The Program of Study is then formally approved by the graduate director, department chair and the graduate dean.

Advisor--When you arrive as a new graduate student in Mining and Metallurgical Engineering, you will be assigned a temporary Advisor, who will help you get started, and who may ultimately become your research Advisor. Your temporary advisor in most cases selected you from the applicant pool as a promising student. We strongly encourage new students to select a general research area and a permanent Advisor sometime during the *first* semester of residence, and the full advisory/examining committee before the end of the *second* semester. Your thesis or dissertation Advisor, in consultation with the committee members as needed, will help you: 1) plan your course schedule, and 2) identify a research project.

You are free to change Advisors or committee members *at any time* during your graduate work. However, if you decide to change Advisors, some discussion with your present Advisor is essential, especially if you have received funding support from a grant. You may have an obligation to provide your present Advisor with data, reports, or other information related to research for which you received funding. If you already have a permanent Advisor and Advisory/Examining committee, a change can be made by submitting a written agreement signed by the student, former Advisor or committee members, new Advisor or committee

members, and the Department Chair. *The Graduate School must also be notified of this change, using their Change of Advisory Committee form.*

Advisory/Examining Committee composition: The Advisory/Examining committee needs to be formed in time for the first committee meeting convened before the end of the 2nd semester. This committee provides guidance during graduate research.

For the M.S. degree, this committee is composed of 3 or more faculty members

- the principal Advisor (a.k.a. Committee Chair, thesis advisor, or major advisor),
- an additional member from the degree program Graduate Faculty list
- Graduate School Representative who is outside of your department and degree program

Doctoral committees require of 5 or more members

- the principal Advisor
- 2 additional members from the degree program Graduate Faculty list
- faculty member from a related discipline (outside of MME)
- Graduate School Representative

The committee members provide additional counseling and expertise beyond that of the thesis advisor, maintain standards, and can help with problems that may arise. A list of all UNR Graduate Faculty may be found on the Graduate School web site, and a search bar allows you to call up those in a specific degree program, if needed.

Both M.S. and Ph.D. committee meetings should be arranged by the student, and should take place a minimum of once each year. Students should be in contact with committee members on a semester basis to keep them apprised of their progress. The role of the Graduate School Representative is to provide an objective external perspective and to assure that Graduate School policies are being followed. The role of the Advisory-Examining Committee in graduate examinations is described later.

Program of Study—Advanced degrees are conferred by the university following approval of the graduate faculty, the graduate dean, and completion of an approved Program of Study. The Program of Study (Graduate School Form) documents the members of the Advisory-Examining Committee, coursework, and research the student has chosen for his/her advanced degree work

Development of a Program of Study is an important component of the graduate program in the Department of Mining and Metallurgical Engineering. The Program of Study, as implemented in this Department, serves a variety of purposes: (1) it defines the classes and the Advisory-Examining Committee; (2) it guides the student and reminds the faculty of student needs if it is produced sufficiently early in the student's stay in the program; (3) it enables students to take charge of their graduate program. The graduate student is free to choose his/her research direction or area of specialization, Research Advisor, and committee members, but the experience of the faculty members is crucial to a judicious selection of appropriate coursework and thesis topic.

The Program of Study should be approved by the Department Chair and then turned into the Graduate School by the end of the 2nd semester for the M.S. students and by the end of the 2nd year for the Ph.D. students. Typically, the Program of Study form is presented and signed at the committee meeting where the student presents his/her thesis proposal.

Changes to the Program of Study—Once the Program of Study is filed with the Graduate school, the student is obligated to take all of the courses listed in the program. Any changes must be made by filing a Change in Program of Study (Graduate School form).

Thesis Proposal –The Department of Mining and Metallurgical Engineering requires that a draft thesis proposal be submitted to the Advisory/Examining committee as part of the Program of Study Package at the first committee meeting by the end of the second semester. This draft should be circulated to the committee a few weeks in advance of the committee meeting. Copies of the draft thesis proposal go only to the committee and are not submitted to the graduate school. The final thesis proposal is usually produced shortly after the first committee meeting, considering any suggestions made during that meeting.

Dissertation Proposal –For Ph.D. students, the initial draft proposal presented at the first committee meeting is usually a preliminary outline. The student should defend his final proposal and get it approved by the Advisory/Examination Committee prior to beginning a substantial part of his/her research work.

Annual Progress Report –Graduate students must fill out a 1-page form annually in all programs. The form is due each year on April 15th and is intended to allow for tracking of student progress through their degree program. The form includes sections for both the student and an advisor's evaluation of their progress (excellent, good, satisfactory, unsatisfactory). Most students who are meeting all deadlines should receive an evaluation of good, whereas those few outstanding students exceeding expectations of their committee will receive an excellent. Failure to file this form may result in an unsatisfactory evaluation. Students making unsatisfactory progress towards their degree will no longer be eligible for departmental TA support.

IV. Graduate School and Departmental Requirements for a M.S. Degree

This section summarizes the standards for the M.S. degree with thesis (Plan A) and non-thesis (Plan B) options. It may be realized that the thesis option is preferred as earning a graduate degree involves much more than just completing a fixed number of graduate courses. The non-thesis option therefore requires that students pass a written comprehensive examination (MINE 795 –1 credit). The student's Advisory/Examining Committee may require the student to take additional courses to provide the degree of proficiency typical of others holding this degree in the student's chosen field of specialization. The number of classes required by the Graduate School is really a minimum, because the amount of preparation a student needs for thesis research varies considerably across departments and specialties.

Course Work for M.S. Degree with Thesis (Plan A) –A minimum of 31 credit hours of graduate courses, including:

- 1 credit Graduate Seminar (MINE 790)
- 6 thesis credits (MINE 797)
- 12 non-thesis credits at the 700 level
- A minimum of 21 credits through courses completed at UNR. For transfer credits, please consult the Graduate Director and see further guidelines below

A minimum of 24 credits of graded courses (grade of C or better and listed on the Program of Study) must be completed. A maximum of 9 credits completed elsewhere (Grade B or better) can be transferred and applied to the M.S. degree at UNR. Eighteen of the 24 credits must be in the major field of study. The overall grade point average for graduate classwork must be maintained above 3.0. If you fall below 3.0, you will be placed on academic probation, and allowed one semester to bring your grades up to 3.0 or above. Failure to meet this standard will result in your dismissal from the program. See Program of Study Requirements on graduate school web site for additional details about requirements.

Course Work for Plan B –A minimum of 34 credit hours of graduate courses, including:

- 1 credit Graduate Seminar (MINE 790)
- A minimum of 18 credits of 700 level courses
- A minimum of 23 credits through courses completed at UNR. For transfer credits, please consult the Graduate Director and see further guidelines below
- 1 credit comprehensive exam course (MINE 795)

A minimum of 32 credits of graded courses (grade of C or better and listed on the Program of Study) must be completed. A maximum of 9 credits completed elsewhere (Grade B or better) can be transferred and applied to the M.S. degree at UNR. 18 of the 24 credits must be in the major field of study. The overall grade point average for graduate classwork must be maintained above 3.0. If you fall below 3.0, you will be placed on academic probation, and allowed one semester to bring your grades up to 3.0 or above. Failure to meet this standard will result in your dismissal from the program. See Program of Study Requirements on graduate school web site for additional details about requirements. A Comprehensive Exam must be taken and passed.

The Graduate Seminar (MINE 790) is required of all students entering either the Plan A or Plan B M.S. programs of the department. The graduate seminar is a forum for faculty and students from UNR and other organizations to present information on cutting edge topics in the Mining and Metallurgical Engineering.

M.S. Examinations

1. Plan A, Thesis Proposal Examination

Students will be required to submit a formal thesis proposal to their committee and have a committee meeting to discuss both the proposal and their proposed Program of Study prior to the end of their second semester in residence (does not include summer semester). This must be approved by their committee and forwarded to the Graduate Director. Failure to complete this requirement in the allotted time will result in the student's dismissal from the program. Under extenuating circumstances, the student may petition for an extension, but any petition must be approved by their thesis committee before it will be considered by the Graduate Director.

- 2. Plan A, Thesis Defense with Final Oral Examination.** A final Oral Examination and Thesis defense, announced two weeks in advance and open to the public (including a public presentation) is held with the Advisory-Examining Committee to evaluate the quality and professional standards of the student's research. After successfully completing this examination and approval of the final draft of the thesis, the student is advanced to Master's

candidacy and may apply for graduation. The thesis defense is usually about 2 hours long and consists of a public talk (~30 – 45 min) followed by a closed session with the committee where questions are asked and specific recommendations/revisions (if any) are suggested by the committee member for the thesis.

- 3. Plan B, Comprehensive Examination.** In the final semester, M.S. students in the Plan B option will be required to sign up for one credit of M.S. Comprehensive Examination (MINE 795), under the direction of the Graduate Director and the Advisor.

Time Limits - All requirements for this degree must be completed within six calendar years preceding conferral of the degree.

V. Graduate School and Departmental Requirements for the Ph.D. Degree

A Ph.D. degree signifies completion of a substantial body of work by the student that displays distinction, original scholarship, and superior achievement.

Residency – A minimum of six semesters of graduate study are required. Two consecutive semesters (Fall and Spring, or Spring and Fall), must be spent at UNR in full-time study (minimum of nine credits per semester) for the Ph.D. Degree. The university residency requirement must be met before a student is allowed to advance to candidacy.

Course Work – A minimum of 75 credit hours of graduate work including:

- 48 credit hours of formal coursework, (at least 30 credits at the 700 level)
- 2 (1+1) credits of MINE 790
- 1 credit of Ph.D. comprehensive exam (MINE 795)
- 24 dissertation credits

With the approval of the Advisory-Examining Committee and Departmental Chair, up to 24 credits (Grade B or better) of graduate work can be transferred from another university and applied to the UNR Ph.D. program. Any exceptions to these requirements must be approved by the Advisory/Examining Committee, Graduate Director, Department Chair, and Graduate Dean. See Program of Study Requirements on the graduate school web site for additional details about requirements.

The Graduate Seminar (MINE 790) is *required* of all students entering the Ph.D. program at the department. Doctoral students must enroll for MINE 790 in a minimum of 2 semesters and obtain satisfactory (S) in both courses to get full credit.

Advisory/Examining Committee: The committee is very important in guiding the student's progress toward an advanced degree, and high priority should be placed on forming the committee early in the graduate program (e.g., the first year). For a student entering a Ph.D. program with a Bachelor's degree, the committee should be formed prior to the completion of 24 credits of graduate work (usually during the 2nd or 3rd semester). For the student with a Master's degree, the committee should be formed by the end of the second semester. The committee is also charged with approving the student's Program of Study.

Ph.D. Examinations - Mining and Metallurgical Engineering requires four examinations for a Ph.D. degree.

1. Qualifying Examination: A formal oral examination is administered by the student's Ph.D. Committee to assess the student's general knowledge of engineering and his/her level of preparation for a Ph.D. program. The examination will be scheduled through the Ph.D. Program Director, and consist of a 1-2-hour oral questioning on fundamental concepts in engineering that would be expected for a doctoral candidate at the end of their first year. Subjects typically covered include the fundamental of engineering topics for the disciplines taught at the department. The Committee will report either "pass", "pass with recommendations" or "fail" based on a simple majority vote in writing to the Graduate Program Director. In the case of "pass", the student may continue in the doctoral program. In the case of "pass with recommendations", the committee will provide suggestions for additional coursework or studies that should be undertaken during the student's progress toward the doctoral degree. These recommendations shall be used by the advisor to help define the student's plan of study. In the case of "fail", the student will not be allowed to continue in the department's doctoral program, but may be allowed to complete the requirements of a Master's degree.

For students entering the Ph.D. program without having a master's degree, the university requires that the qualifying examination be taken prior to completion of 24 credits. In MME, the exam is generally taken during the first committee meeting, by the end of the 2nd semester of residency. The qualifying exam can be delayed in unusual cases until the end of the third semester.

2. Candidacy Examination. The Ph.D. Candidacy Examination is intended to evaluate the student's overall knowledge and understanding of his/her field gained through his/her course work. Students must sign up for 1 credit of MINE 795 the semester they take their exam with the Ph.D. program director. The candidacy examination includes both oral and written sections and should cover material offered in formal graduate course work completed by the student at UNR. A minimum of three examiners selected by the student and the advisor need to set questions for the examination. An examiner does not necessarily have to be a member of the Ph.D. committee of the student. The written part should be completed over a one-week period, and is followed within two weeks by an oral examination, typically of 2-3 hours duration. The student is admitted to candidacy following completion of residency requirements, course requirements, and acceptable performance on the Candidacy Examination.
3. Dissertation Proposal Examination. In addition to the Qualifying Exam, each doctoral student is expected to submit a formal dissertation proposal to their Advisory-Examining committee and have a committee meeting to seek approval for both the proposal and the proposed Program of Study no later than the end of their fourth semester in residence (does not include summer semester).

Specific guidelines for the Candidacy Examination Procedure:

- A. The Ph.D. program Director and student's Advisory-Examining Committee are jointly responsible for the format of the exam, and for its execution and results.

- B. The exam may be taken after a minimum of 75% of the student's required coursework (beyond the B.S.) is complete, but must be taken no later than eight calendar months before graduation.
 - C. The exam must be both oral and written, and must test the student's broad range of knowledge, and not merely the course work that has been completed.
 - D. The student fails the exam if more than one negative vote is cast by members of the Advisory/Examining Committee. The exam may be retaken once, if additional study is approved by the Advisory-Examining Committee. The Advisory-Examining Committee determines the period of additional study.
 - E. The Advisory-Examining Committee is the official examining committee for both written and oral examinations. External examiners may be added only with prior consent of the Advisory-Examining Committee.
 - F. The major advisor is the chair of the Advisory-Examining Committee, and is responsible for:
 - I. Ensuring that the Graduate School Guidelines are followed.
 - II. Ensuring that the Departmental Guidelines are followed.
 - III. Ensuring that the format and procedures for the examination that have been approved by the Advisory-Examining Committee are followed.
 - IV. Keeping committee members and the student informed at each stage of the process.
4. Dissertation Defense and Oral Exam. The last examination is the dissertation defense, announced two weeks in advance and open to the public, is held with the Advisory-Examining Committee to evaluate the quality and professional standards of the student's research. The defense is usually about 2 to 3 hours long and consists of a public talk (~30 – 45 min) followed by a closed session oral examination with the committee where questions are asked and specific recommendations/revisions may be suggested for the dissertation.

Dissertation - The preceding steps help make sure you are prepared for the research and writing of a dissertation. The dissertation must represent original and independent research of high quality and should reflect a mastery of research techniques and literature. The dissertation documents the ability of a student to select an important problem to be investigated, to study it competently, and to express the results in a comprehensible manner.

According to Graduate School regulations, the format of the dissertation can vary in that the student may elect either the "dissertation" or "publication" option. The Graduate School standards for organization, scope, and content of the dissertation are the same regardless of the choice of option. For the publication option, MME requires acceptance of at least one, preferably two, peer-reviewed journal publications having the student as the lead author as a prerequisite to successful completion of the dissertation.

Publication of one's dissertation prior to its approval by the committee does not in any way imply that it will be approved by the student's committee.

Time Limits - All requirements for the Ph.D. degree, exclusive of prior M.S. work, must be completed within eight (8) calendar years.

VI. Theses and Dissertations

The Department of Mining and Metallurgical Engineering has several important policies regarding theses and dissertations.

First, the existing Graduate School regulations regarding the format, scope, and organization of the thesis or dissertation are the same regardless of whether the student chooses the “dissertation” or “publication” option. Departmental policy on theses and dissertations in addition specifies that all figures, tables, and captions must be interleaved or embedded within text where first cited, as in published journal articles. Use and follow the guidelines of a refereed journal in your field for headings, citations, figures and captions, and references cited.

Second, the student’s Advisor is ultimately responsible for the research quality. This responsibility resides with the Advisor regardless of any previous or pending publications by the student. This means that publication by itself is not considered by anyone to be a substitute for approval of the thesis or dissertation by the Advisory-Examining Committee.

Third, if a student chooses the “publication option”, the student and advisor will discuss in advance, agree to, and place in writing, a statement defining what publications will be expected of the student. These publications can be derived from, say, chapters of the dissertation, and formatted for the appropriate journals. This approach enables the research to be organized in modules, but it also is expected that the publications will be tied together into a coherent whole, which is the main rationale for writing an extended work such as a thesis or dissertation.

General comments regarding publication--Publication of the significant results of thesis or dissertation research is an important aspect of graduate education, but its role and emphasis can vary between programs. Normally, the M.S. thesis is considered to be sufficient evidence of competence at the Master's level. However, it is often to the student's advantage in the job market to publish part of the thesis. The Department of Mining and Metallurgical Engineering encourages, but does not mandate, publication of the M.S. thesis. However, individual faculty advisors may add to this recommendation as long as this is clearly understood and agreed to by the student and specified in the Program of Study.

Research at the Ph.D. level should lead to publications in refereed scholarly journals. By definition, this work involves new methods, collection of new data, formulation of new analyses, or perhaps construction of new syntheses that advance the state-of-the-art in a particular field. Publication by the student can be very important at this stage of his/her career.

In practice, however, it may be unrealistic or impossible to predict whether or what parts of the thesis or dissertation can or should be published. Only as the work nears completion does this usually become apparent. The student should not hesitate to negotiate how publication should be carried out (who is to be first author, where it will be published, etc.) early on. In certain cases, a student’s work may be an integral part of the Advisor’s research and publications. To ensure that authorship and credit issues are resolved fairly, the student should discuss these issues with the Advisor and committee members. Failing resolution at that level, students should meet with the Graduate Program Director or Department Chair.

General comments about rough drafts of the thesis or dissertation--The end product of your graduate degree in Mining and Metallurgical Engineering is your thesis or dissertation. That document is a record of your research methods and results, and should be carefully crafted.

Others will probably use your work in years to follow, so it makes sense to understand what is expected in the final form of the thesis or dissertation.

The difficulties and time commitment for the completion of a thesis or dissertation must not be underestimated. Early drafts should be submitted to the Advisor in manageable portions before progressing to a second or third draft to be distributed to the rest of the committee. The committee members will appreciate a clean, better-written draft, and will have a better chance of evaluating the science. Most Advisors will insist on this strategy.

The Advisor and the Advisory-Examining Committee are the “quality control” on the theses and dissertations and many improving iterations should be expected. However, the bounds of modifications should be expected to comply with approved Program of Study. The Committee must be fair with expectations.

Several months (3 or more) is expected for just for the writing an M.S. thesis; additional time is then needed for the reviews and rewriting. Thus, for a May graduation, an M.S. student should be well into writing by September of the previous year. For the Ph.D., eight months to a year of full-time writing are commonly necessary to produce the first draft or two. This effort may be streamlined by planning ahead and discussing each aspect of the research with Advisor and committee members. If the process is followed correctly, there should be very few surprises during the writing phase of the graduate education. The ultimate aim is to defend the thesis or dissertation and at that point only minor changes, if any, should be left to do to the last draft.

Thesis Credits: Per graduate school policy beginning Fall of 2013 all thesis credits must now be taken as S/U, Satisfactory/Unsatisfactory. A grade of “U” will not be factored into the graduate GPA, and therefore will not affect academic standing, but this still suggests failure to meet requirements for the degree. Additionally, a grade of “U” means that those credits are not be applicable to the program of study and do not accrue towards the total number of required credits for thesis/dissertation. A grade of “U” affects the number of completed credits applicable for financial aid purposes. Should a “U” grade be received, a plan of action must be discussed with the Graduate Director to get back on track for timely completion of the degree.

Notice of completion: This document is generally signed by the committee at the end of a successful thesis or dissertation defense and can be downloaded from the *forms* section of the Graduate School web site. In some cases, the Advisor may withhold their signature until revisions are made. Once the Committee has signed off on the notice of completion, Graduate Director or the Department Chair may sign the notice of completion. After collecting all departmental/committee signatures, the form should be turned to the Dean of the Graduate School before the posted deadline (posted on the graduate school web site).

Final Review Approval: After your final revisions have been completed and approved by the Chair of your advisory committee you need to obtain their signature on the Final Review Approval form and deliver this to the Graduate School for authorization and date to accept the final thesis.

Thesis Filing Guidelines: Most students elect to deliver the thesis electronically, in this case the signature page (“Committee Approval Page”) can be on standard paper. If you elect to submit paper copies of your thesis/dissertation the signature page must be on the required bond.

Pay careful attention to format, page numbering and spacing requirements specified by the graduate school. Details and additional information are available on the Grad School website: <https://www.unr.edu/grad/student-resources/filing-guidelines>

VII. Requirements for Graduate Degree Programs Conferred through MME

Ph.D. in Mineral Resources Engineering

Required coursework: Aside from MINE 790 and 795, there are no mandatory core courses specified for the Ph.D. degree in Mining and Metallurgical Engineering at this time. Recommended course work is laid out in the Program of Study designed by the Advisory/Examination Committee on an individual basis.

M.S. Mining Engineering

Required coursework: Aside from MINE 790 and 795, there are no mandatory core courses specified for the M.S. degree in Mining Engineering. Students admitted to this program from Bachelor of Science degrees that are non-engineering related are expected to make up the following undergraduate course deficiencies as a minimum: ME 241 (statics), ME 242 (dynamics), ME 311 (thermodynamics), and MINE 350 (fluid mechanics). Additionally, a student's examination committee may recommend that the third semester of calculus and a course on differential equations be added as deficiencies. Moreover, all M.S. students are encouraged to take at least one course from each of the mining and metallurgical engineering faculty for purposes of broadening knowledge of the engineering discipline. Students have two-degree options: Plan A (thesis) and Plan B (non-thesis). Students opting for Plan B are required to pass the Comprehensive Exam (MINE 795).

M.S. Metallurgical Engineering

Required coursework: Aside from MINE 790 and 795, there are no mandatory core courses specified for the M.S. degree in Metallurgical Engineering. Students admitted to this program from Bachelor of Science degrees that are non-engineering related are expected, at a minimum, to make up the following undergraduate course deficiencies: ME 241 (statics), ME 311 (thermodynamics), and MINE 350 (fluid mechanics). Additionally, a student's examination committee may recommend that the third semester of calculus and a course on differential equations be added as deficiencies. Moreover, all M.S. students are encouraged to take at least one course from each of the mining and metallurgical engineering faculty for purposes of broadening knowledge of the engineering discipline. Students have two-degree options: Plan A (thesis) and Plan B (non-thesis). Students opting for Plan B are required to pass the Comprehensive Exam (MINE 795).

How do I apply?

Applicants are strongly encouraged to contact prospective faculty advisors to discuss their interests prior to applying. Applicants are also encouraged to visit UNR campus, if possible, to see the department and meet with their prospective faculty adviser prior to applying.

Applicants must meet the University's [Graduate School admission requirements](#) and submit their application through the Graduate School. For entry into the geo-engineering (soon to be mineral resources engineering) Ph.D. program, the department requires a combined GRE score of 1,200 or higher for the verbal and quantitative sections and an undergraduate degree in mining or metallurgical engineering or closely related fields.

Prospective students must submit the following when applying:

- Copy of Graduate Record Examination (GRE) scores - sent directly to the University Graduate School, with unofficial copies sent separately to the Department of Geological Sciences and Engineering
- Three letters of recommendation certifying ability to perform graduate-level work at the Ph.D. level - sent directly to the department
- A two-page personal statement of interest stating why the University of Nevada, Reno is their school of choice, why they wish to pursue the desired degree, and what specialties and/or faculty the applicant is interested in - sent directly to the department
- Copies of GRE scores, transcripts and TOEFL scores (if applicable) - sent directly to the department

The admissions committee gives comparable weight to each item in the application package, so applicants will not be denied admission based solely on their GPA or GRE scores. Application deadlines are flexible; however, it is expected that students would their complete application process by

- February 1, for fall semester admission
- September 15 for spring semester admission
- March 1 for summer semester admission

To ensure full consideration, GRE scores and official transcripts should arrive at the University Graduate School well before these deadlines. The applicant's personal statement and letters of recommendation should be also arrive by these deadlines.

Is funding available?

The department offers financial assistantships, i.e. Graduate Research Assistantships (GRA) and Graduate Teaching Assistantships (GTA). Requests for teaching assistantships should be submitted to the department prior to March 15, but all applications will be considered regardless of date of

submission. Requests for research assistantships must be submitted directly to the corresponding professors in the department.

Who to contact?

Mining and Metallurgical Engineering Department

Phone (775) 784-6961

Fax (775) 784-4594

Email mme@unr.edu

Ph.D. (Mineral Resource Engineering) Program Director:

Charles Kocsis, Ph.D.

Associate Professor

(775) 784-6989

kkocsis@unr.edu

M.S. (Mining Engineering) Program Director:

TBA

M.S. (Metallurgical Engineering) Program Director

Carl Nesbitt, PhD

Associate Professor

(775) 784-8287

carln@unr.edu

Course requirements for all graduate programs will be listed in our graduate catalogue.

What Are the other Program Requirements?

The following deficiencies must be made up by non-mining engineering students entering the M.S. Degree program in Mining Engineering or the Ph.D. program in geo-engineering (mineral resources engineering) unless a special exception is approved jointly by the respective adviser, program director and department chair.

1. Students who have a B.S. degree in a physical science or other fields (e.g., geology, physics, chemistry, economics, etc.), must:
 - o pass the Fundamentals of Engineering (FE) exam, or satisfactorily complete (i.e., with a cumulative B average) a minimum of 12 credits of basic engineering courses to have a reasonable chance of passing the FE (e.g. this requirement can be met taking courses such as Statics, Dynamics, Strength of Materials, Fluid Mechanics, Thermodynamics, Electricity).

- have an adequate preparation in geology, i.e. a minimum of 6 credits in geology, taken from GEOL 211, GEOL 332, GEOL 385, or equivalent.
 - have basic mining knowledge, e.g., a course in mining methods or broad varied industrial mining experience, and, prior to or as part of the graduate program, no fewer than 6 credits of mining engineering classes.
2. Students, who have a B.S. degree in Engineering from an accredited or equivalent engineering school, must:
- have an adequate preparation in geology, i.e. a minimum of 6 credits in geology, taken from GEOL 211, GEOL 332, GEOL 385, or equivalent.
 - have basic mining knowledge, e.g., a course in mining methods or broad varied industrial mining experience, and, prior to or as part of the graduate program, no fewer than 6 credits of mining engineering classes.

What Would Be a Good Educational Schedule?

Recommended schedule for M.S. Degree in Mining and Metallurgical Engineering

First semester:

1. Select Thesis advisor
2. Discuss program of study with Thesis advisor
3. Discuss possible thesis topics with Thesis advisor

Second semester:

1. Select Advisory/Examining committee
2. Prepare thesis proposal
3. Thesis proposal. Hold first committee meeting to defend proposal and obtain approval for Program of Study from committee.
4. Begin thesis research
5. Submit Program of Study to Graduate School

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Third semester:

1. Graduate seminar (MINE 790)
2. Complete 3/4th of coursework.
3. Discuss thesis outline with Thesis advisor. Write introductory and background sections of thesis.
4. Go to Graduate School web site and familiarize yourself with upcoming deadlines to apply for graduation and submit notice of completion.

Fourth Semester:

1. Complete all coursework for the M.S. degree
2. Submit rough drafts of thesis text to advisor early in semester
3. Wrap up thesis research early in semester
4. Circulate thesis draft to committee, allowing sufficient time for their review (usually 3 weeks minimum).
5. Apply for graduation
6. Schedule final defense with committee once draft is approved.
7. Present public oral thesis defense. And revise thesis as necessary.
8. Submit a draft of thesis at time of defense to department Chair.
9. Obtain signatures on notice of completion and turn in with thesis by deadline posed on the Graduate School web site.

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Recommended schedule for Ph.D. Degree (entering with M.S.)

First semester:

1. Select Dissertation advisor
2. Discuss program of study with Dissertation advisor
3. Discuss possible Dissertation topics with advisor
4. Select 2 additional departmental members for Advisory/Examining committee

Second semester:

1. Graduate seminar (MINE 790)
2. Finish selecting Advisory/Examining committee
3. Prepare dissertation proposal outline and draft
4. Hold committee meeting; pass qualifying exam, obtain approval for classes and Program of Study from committee.

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Third semester:

1. Continue to do coursework
2. Dissertation research (begin before summer)

Start working on dissertation proposal

- 3.
- 4.

Fourth Semester:

1. Complete class work
2. Pass written and oral comprehensive exam
3. Apply for Candidacy
4. Continue dissertation research
5. Complete dissertation proposal and circulate to committee for approval.
6. Copy of proposal to Graduate Director
Submit Program of Study to graduate school

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Fifth semester:

1. Wrap up research
2. Begin writing introductory sections of dissertation
3. Begin circulating rough drafts of dissertation to advisor
4. Go to Graduate School web site and familiarize yourself with upcoming deadlines to apply for graduation and submit notice of completion.

Sixth Semester:

1. Circulate draft of dissertation to advisor early in semester. (Allow 3 weeks for review)
2. Circulate revised draft to committee (allow 3 to 4 weeks for review)
3. Apply for graduation
4. Schedule final oral exam (defense) with committee.
5. Public presentation of thesis and defend to committee, revise dissertation as necessary
6. Submit a draft of dissertation at time of defense to department Chair.
7. Obtain signatures on notice of completion and turn in with thesis by deadline posed on the Graduate School web site.

Recommended schedule for Ph.D. Degree (entering without M.S.)

First Semester:

1. Select Dissertation advisor
2. Discuss program of study with Dissertation advisor
3. Discuss possible Dissertation topics with advisor

Second semester:

1. Graduate seminar (MINE 790)
2. Select Advisory/Examining committee
3. Prepare dissertation proposal outline
4. Hold first committee meeting; take qualifying exam, obtain approval for classes, proposal, and Program of Study from committee

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Third semester:

1. Graduate seminar (MINE 790)
2. Dissertation research (begin during prior summer)
2. Continue class work
3. Work on dissertation proposal

Fourth Semester:

1. Continue dissertation research
2. Complete dissertation proposal and circulate to committee
3. Copy of proposal to graduate Director
4. Submit Program of Study to graduate school

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Fifth semester:

1. Continue dissertation research
2. Complete class work
3. Pass written and oral comprehensive exam

4. Apply for Candidacy

Sixth Semester:

1. Complete residency requirement
- 2.. Wrap up dissertation research.
3. Begin writing introductory sections of dissertation.
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Depending on progress on your research topic, continue with coursework and thesis credits until prepared to proceed. Note the expectation for time to completion for a Ph.D. without an M.S. is a maximum of 5 to 6 years.

Seventh semester:

1. Wrap up dissertation research
2. Circulate draft of dissertation to advisor (Allow 3 weeks for review)
3. Go to Graduate School web site and familiarize yourself with upcoming deadlines to apply for graduation and submit notice of completion.

Eighth semester:

1. 2. Circulate revised draft to committee (allow 3 to 4 weeks for review)
2. Apply for graduation
3. Schedule final oral exam (defense) with committee
Post public announcement of your defense a minimum of 1 week in advance and choose a room that will hold a sufficient public audience (30+ people)
4. Public presentation of thesis and defend to committee, revise dissertation as necessary
5. Submit a draft of dissertation at time of defense to department Chair.
6. Obtain signatures on notice of completion and turn in with thesis by deadline posed on the Graduate School web site.