COLLEGE OF SCIENCE and COLLEGE OF ENGINEERING
University of the Philippines at Diliman

Guidelines for the M.S. Program in Materials Science and Engineering

1. Objective of the Program

The Program leading to the degree of "Master of Science in Materials Science and Engineering" or M.S. (MSE) aims to provide students with the basic graduate education that will prepare them for professional careers as materials scientist and engineers in industry or the public sector.

2. Administration of the Program

The M.S. (MSE) Program will be a joint master's degree program for the College of Science and the College of Engineering that shall be administered by a joint intercollegiate graduate committee called Materials Science and Engineering Committee (MSEC). The MSEC shall be composed of those regular faculty members of either participating college who possess doctoral degree and who are officially appointed by their respective deans. The MSEC shall also be jointly chaired by two Co-Chairpersons, one each from the two participating colleges and designated by their respective deans.

The MSEC shall, in general, decide on the admission of students into the Program, their progress through the Program, and their graduation from the Program and, in particular, exercise the same powers and responsibilities as those of the Graduate Committee of an Institute/Department.

3. Admission to the Program

3.1 Admission into the M.S. (MSE) Program shall require (a) a BS degree in Science or Engineering or their equivalents from a recognized institution of higher learning and (b) a high degree of intellectual capacity and aptitude for advanced study and research in materials science and engineering;

3.2 Applications for admission into the program shall be submitted to the Graduate Office of either participating college (depending on whether the applicant has a science or engineering undergraduate degree), referred to the MSEC for evaluation and decision, and endorsed by the MSEC to the respective deans for official notification of the decision.

3.3 Each application for admission into the program must be accomplished on the MSEC's official application form and accompanied by: (a) an official transcript of records; (b) two (2) written recommendations from former professors; and (c) the officially prescribed application fee.

3.4 A student admitted to the Program shall be initially registered as a graduate student of either the College of Science or the College of Engineering (depending on whether he/she has a Science or Engineering undergraduate degree), but his/her final affiliation shall be to the college where his/her thesis adviser belongs or where most of his/her graduate MSE courses were taken.

4. General Requirements for the M.S. Degree

The M.S. (MSE) degree may be obtained through either of the following two (2) options:

4.1 Thesis Option

To qualify for the M.S. (MSE) degree under the Thesis Option, a student must satisfy the following requirements: (a) complete a minimum of twenty four (24) units of the graduate core courses in MSE; (b) maintain a Cumulative Weighted Average Grade (CWAG) of "2.0" or better in his/her graduate courses at the end of each academic year; (c) complete one (1) unit of graduate seminar; (d) successfully defend a Master's Thesis in a Master's Examination; and (e) submit at least six (6) bound and certified copies of the approved Master's Thesis.

4.2 Non-Thesis Option

To qualify for the M.S. (MSE) degree under the Non-Thesis Option, a student must satisfy the following requirements: (a) complete thirty six (36) units of formal graduate courses in MSE; (b) maintain a Cumulative Weighted Average Grade (CWAG) of "2.0" or better in his/her graduate courses at the end of academic year; (c) complete one (1) unit of graduate seminar; (d) pass the Master's Preliminary Examination; and (e) pass the Qualifying Examination.

(A Student admitted into the Ph.D. (MSE) Program without master's degree in MSE may pick up the MS (MSE) degree on his/her way to the Ph.D. (MSE) degree by satisfying the above requirements under the Non-Thesis Option).

5. The Program Adviser and Program of Study

5.1 The Program Adviser

Each student admitted into the MS (MSE) Program shall be assigned a Program Adviser to be designated by the MSEC from among its members. The Program Adviser shall advise, guide, and evaluate the student until the later obtains a Thesis Adviser (in the case of a student in the Thesis Option) or obtains the M.S. degree (in the case of a student in the Non-Thesis Option).

5.2 Placement Examination

A student admitted into the M.S. (MSE) Program maybe required by MSEC to take a Placement Examination for the purpose of assessing his/her academic preparation. A student who does not perform satisfactorily in the Placement Examination or who has a deficient academic preparation may be required to complete (without graduate credits) appropriate undergraduate remedial courses in the College of Science or College of Engineering.

5.3 The Program of Study

Within the first semester of the student's initial year in the M.S. (MSE) Program, a Program of Study shall be designed by the Program Adviser, in consultation with the student and on the basis of the latter's academic preparation and desired specialization, and submitted to the Graduate Office concerned through the MSEC. Subsequent revisions in the Program of Study must be approved by the Program Adviser and communicated as soon as possible to the Graduate Office concerned through the MSEC.

5.4 Semestral Study Load

The normal study load per semester shall be nine (9) to twelve (12) units of formal courses for full time students and six (6) to nine (9) units for part time students.

6. Course Requirements and Transfer of Credits

6.1 Course Requirements for the Thesis Option

Every student under the Thesis Option shall be required to complete the following twenty four (24) units of graduate core courses in MSE.

MSE 201 – (Fundamentals of Materials Science & Engineering)	3 units
MSE 211-219 – (Combination of Laboratory Modules in MSE)	6 units
MSE 225 – (X-Ray Crystallography and Spectrography	3 units
MSE 231 – (Thermodynamics of Materials)	3 units
MSE 233 – (Kinetics of Materials)	3 units
MSE 241 – (Physics of Solids)	3 units
MSE 251 – (Mechanical Properties of Solids)	3 units
TOTAL	24 units

The laboratory Modules in MSE consist of the following:

MSE 211 (Laboratory Module in Transmitted Light Microscopy)	1 unit
MSE 212 (Laboratory Module in Mineragraphy)	1 unit
MSE 213 (Laboratory Module in Crystallography)	1 unit
MSE 214 (Lab. Module in Vacuum Tech & Thin Film Deposition)	1 unit

MSE 215 (Lab. Module in Electronic & Magnetic Measurement)	1 unit
MSE 216 (Lab. Module in Ceramics processing & Characterization)	2 units
MSE 217 (Laboratory Module in Scanning Electron Microscopy)	1 unit
MSE 218 (Laboratory Module in Metallography)	1 unit
MSE 219 (Laboratory Module in Thermal Analysis)	1 unit

Students who have previously taken a course equivalent to any of this core courses will be required to replace it with an appropriate specialization course to satisfy the 24 unit course requirements. Students who have not completed courses in boundary-value problems and numerical methods will be required to take additional mathematics courses covering these subjects.

The Specialization Courses include:

MSE 243 – (Epitaxial Growth)	3 units
MSE 243.1 – (Epitaxial Growth Laboratory)	2 units
MSE 245 – (Semi Conductor Characterization)	3 units
MSE 245.1 – (Semi-Conductor Characterization Laboratory)	3 units
MSE 253 – (Heat Treatment of Ferrous and Special Alloys)	3 units
MSE 255 – (Metal Casting)	3 units
MSE 265 – (Ceramics Materials)	3 units
MSE 266 – (Polymer Materials)	3 units
MSE 267 – (Surface Science)	3 units
MSE 268 – (Degradation of Materials)	3 units
MSE 271 – (Physics of Liquid Crystals)	3 units
MSE 271.1 – (Applied Liquid Crystals I)	3 units
MSE 271.2 – (Applied Liquid Crystals II)	3 units
MSE 275 – (Advanced Physics of Solids I)	3 units
MSE 276 – (Advanced Physics of Solids II)	3 units
MSE 281 – (Dislocation Theory)	3 units
MSE 283 – (Semi Conductor Materials Processes)	3 units
MSE 283.1 – (Semiconductor Device Fabrication Laboratory)	2 units
MSE 285 – (Electron Microscopy)	3 units
MSE 286 – (Powder Technology)	3 units
MSE 287 – (Crystal Growth)	3 units
MSE 287.1 – (Crystal Growth Laboratory)	2 units
MSE 298 – (Special Problems)	3 units

6.2 Course Requirement for the Non-Thesis Option

Every student under the Non-Thesis Option shall be required to complete thirty six (36) units of graduate MSE courses consisting of the aforementioned twenty-four (24) units of graduate core courses in MSE plus twelve (12) units of specialization courses in MSE. Again, a

student who has previously taken a course equivalent to any of the core courses will be required to replace it with an appropriate specialization course.

6.3 Transfer of Credits from Another University

Subject to the recommendation of the MSEC and the approval of the Dean concerned, graduate courses taken by the student in another university may be credited towards his/her M.S. (MSE) course requirements provided that: (a) These courses were taken within the last five (5) years prior to his/her admission to the M.S. (MSE) Program; (b) These courses have been validated by the MSEC through appropriate means; and (c) the number of graduate units which may be credited shall not exceed three-eights (3/8) of the total number of units in the student's course requirements for the M.S. (MSE) degree.

6.4. Transfer of Credits from another Program

Subject to the recommendation of the MSEC and the approval of the Dean concerned, graduate courses taken by the student under another program of the University of the Philippines may be transferred for credit to his/her course requirements for the M.S. (MSE) degree provided that: (a) these courses were taken within the last five (5) years prior to the student's admission or transfer to the M.S. (MSE) Program; and (b) these courses have not been credited to a degree previously obtained by the student.

7. Grade Requirement

7.1 Grading System

The following numerical grades shall be used in the graduate MSE courses: 1.0 (Excellent), 1.25, 1.50 (Very Good), 1.75, 2.0 (Good), 2.25, 2.50 (Satisfactory), 2.75, 3.0 (Pass), 4.0 (Conditional), INC (Incomplete) and 5.0 (Fail). For special courses, however, the following non-numerical grades may be given: "P" (pass), of "R" (Repeat); "S" (Satisfactory), or "U" (Unsatisfactory).

7.2 Cumulative Weighted Average Grade

To remain in good standing in the M.S. (MSE) Program, a student must maintain a Cumulative Weighted Average Grade (CWAG) of "2.0" or better in his/her course work at the end of each academic year until completion of his/her program study. The student's CWAG shall be computed by his/her Program Adviser at the end of each academic year and reported by the MSEC to the Graduate Office concerned.

7.3 Failure to satisfy the Grade Requirement

A student who fails to satisfy this grade requirement at the end of the academic year shall be disqualified from the M.S. (MSE) Program unless the MSEC decides on justifiable

grounds and upon the recommendation of the students Program Adviser, to put him/her on probation for a period of one (1) to (2) semesters. Failure to obtain the minimum CWAG after the probation period shall automatically disqualify the student from the M.S. (MSE) Program.

8. Seminar Requirement

Every student in the M.S. (MSE) Program must complete one (1) unit of graduate seminar in addition to the formal course requirements.

9. The Master's Thesis

9.1 The Nature of Master's Thesis

Each student in the Thesis Option shall be required to submit a master's thesis which must be a scholarly work embodying a supervised scientific research by the student and presenting, in a scholarly manner, a worthwhile contribution to knowledge in materials science and engineering.

9.2 The Thesis Adviser and Reader

After a student in the Thesis Option finds a suitable Thesis Adviser, he/she will be assigned a Thesis Reader by the MSEC. In special cases requiring joint advising, a Thesis Co-Adviser may be assigned by the MSEC to the student in addition to a Thesis Reader.

Either the Thesis Adviser or Co-Adviser, but not both, may belong to an institution outside of U.P. Diliman. The Thesis Reader may also belong to an institution outside U.P. Diliman.

The Thesis Adviser and the Thesis Reader (as well as the Co-Adviser, if any) shall be formally appointed by the Dean concerned upon the recommendation of the MSEC. They shall be responsible for (a) advising the student in the preparation of his/her Thesis Proposal, (b) guiding and supervising his/her thesis research, and (c) endorsing his/her master's thesis for defense in a Master's examination.

9.3 The Thesis Proposal

Before the Thesis Research can be formally started, the student must first prepare a written Thesis Proposal with the advice of his/her Thesis Adviser and Reader (as well as Thesis Co-Adviser, if any) and submit it to the MSEC for approval. Upon approval of his/her Thesis Proposal, the student may then proceed to carry out his/her thesis research. A certified copy of the approved Thesis Proposal must be submitted by the MSEC to the Graduate Office concerned.