



Materials Science and Innovation
(International Program)

MSc Handbook 2020/21

WALAILAK UNIVERSITY



Master of Science (Materials Science and Innovation) International Program, 2020

Philosophy and Expected Learning Outcomes of the Program

1. Philosophy of the Program:

To provide a comprehensive understanding of aspects related to the applications and development in Materials Science and Innovation today. We motivate our students to develop their ability to research, design, assess, implement and review solutions to real-life problems across a wide range of materials. This degree course prepares students to become independent, ethical and responsible Materials Science and Innovation professionals with a global appeal.

2. Expected Learning Outcomes of the Program:

Expected Learning Outcomes of our Master of Science program are formulated according to the skills needed internationally for jobs in Materials Science and Innovation, feedback received from stakeholders and the past record of our three graduates' programs (Chemistry, Physics and Materials Science and Engineering) employment and the direction of the National Strategy (2018-2037): Upon completion of the doctoral program, graduates must be able to:

Be a creative and critical thinker:

1. Demonstrate broad and coherent knowledge of pertinent areas of materials science related to their field of interest.
2. Exhibit an in-depth understanding of the underlying principles and applications of the various instrumentation, techniques and/or software critical to their research projects.
3. Properly collect, analyse, assess, and evaluate the data gathered in their experiments to make logical, reasonable, and valid scientific arguments.

Be an effective communicator:

4. Effectively communicate the fundamental aspects of their field of interest as well as their research ideas and experimental results, both in oral and written form.

Be a reflective life-long learner:

5. Work efficiently in a highly dynamic, multi-cultural and interdisciplinary environment.
6. Acquire sufficient skills and competencies needed to embark on a professional career.

Be a service-driven citizen:

7. Always conduct themselves ethically and responsibly in the pursuit of their scientific and professional objectives.

Our courses are taught by expert academics, through formal lecturing and student-led course works. Our students will have access to world-leading knowledge and infrastructure by working on real research projects as part of established research groups. Students are expected to make a genuine contribution to live projects, and to produce original research of a standard sufficient for peer reviewed publications.



MSc in Materials Science and Innovation Program's Structure

The Master of Science program operate in two term system with total credits for graduation of 36 credits for both Type A1 (research only) and Type A2 (research and coursework).

Courses	Type A1	Type A2
1) Compulsory	8*	12
- Developed research skills	6*	6
- Seminar group	2*	2
- Advanced research skills	-	4
2) Selective	-	6
3) Thesis	36	18
Total	36	36

* Not counting credits but must have study grading as S.

Note: All students must attend seminar every term even though they might not register the seminar course for that term.

Placement plan

Type A1 (total credits 36, Two term system)

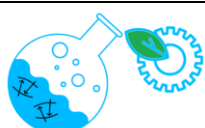
Year	Term 1		Term 2	
1	MSI63-920 Thesis	10 Credits	MSI63-920 Thesis	10 Credits
	MSI63-600 Skills for Research Scientists *	2(1-2-3)	MSI63-681 Seminar 1*	1(0-3-2)
	MSI63-601 Project planning and proposal writing *	2(1-2-3)	MSI63-602 Technological Innovation and Entrepreneurship *	2(1-2-3)
	Total	10 Credits	Total	10 Credits
2	MSI63-920 Thesis	10 Credits	MSI63-920 Thesis	6 Credits
	MSI63-682 Seminar 2*	1(0-3-2)		
	Total	10 Credits	Total	6 Credits

* Not counting credits but must have study grading as S.

Type A2 (total credits 36, Two term system)

Year	Term 1		Term 2	
1	MSI63-xxx Core course	2 Credits	MSI63-xxx Selective course	3 Credits
	MSI63-xxx Core course	2 Credits	MSI63-xxx Selective course	3 Credits
	MSI63-921 Thesis	2 Credits	MSI63-921 Thesis	3 Credits
	MSI63-600 Skills for Research Scientists	2(1-2-3)	MSI63-681 Seminar 1	1(0-3-2)
	MSI63-601 Project planning and proposal writing	2(1-2-3)	MSI63-602 Technological Innovation and Entrepreneurship	2(1-2-3)
	Total	10 Credits	Total	12 Credits
2	MSI63-921 Thesis	9 Credits	MSI63-921 Thesis	4 Credits
	MSI63-682 Seminar 2	1(0-3-2)		
	Total	10 Credits	Total	6 Credits

* Not counting credits but must have study grading as S.



Your study path toward Master

Type A1



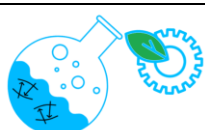
Type A2



List of important web site and personal

College of Graduate Studies
 Center for Educational Services
 Center for Library Resources and Educational Media
 Center for Digital Technology
 Center for Scientific and Technological Equipment

<https://grad.wu.ac.th/>
https://ces.wu.ac.th/webces/ces_eng.html
<http://clm.wu.ac.th/main/Index.aspx>
<https://cdt.wu.ac.th/?lang=th>
https://cse.wu.ac.th/?page_id=2321&lang=en



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M.Sc. and Ph.D. Program in Agro-Industry and Biotechnology
M.Sc. and Ph.D. Program in Materials Science and Innovation
Ph.D. Program in Health Science



Supansa Kaewjaijong



Role and Duty:

M.Sc. and Ph.D. Program in Agro-Industry and Biotechnology | M.Sc. and Ph.D. Program in Materials Science and Innovation | Ph.D. Program in Health Sciences



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College of graduate studies subcommittee meeting.



Student development affairs.



Research scholarships.



Information technology systems.



GRAD-MS systems.



Online public relations.



Somruethai Bouyam, Ph.D.



Role and Duty:

College of Graduate Studies Subcommittee Meeting | Information Technology System | Student Development Affairs | Research Fund | GRADMS | Online Public Relations



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College of graduate studies committee meeting.



Admission.



Graduation.



Thesis.



Scholarships.



Niramon Boonsang



Role and Duty:

College of Graduate Studies Committee Meeting | Thesis | Admission | Scholarships | Graduation



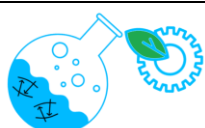
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Progress Seminar Presentation Rubric

	5- Excellent	4 – Very good	3 – Good	2 - Poor	1 – Very poor
Subject Matter					
1. Understanding: did the student show an understanding of the material appropriate to a postgraduate chemistry student?	The student understood all the material.	The student understood most of the material, but the understanding of some points was superficial.	The student has reasonable understanding, but there were some errors.	The student showed understanding of many issues, but errors were frequent.	The student committed many errors, and demonstrated little understanding of the material.
2. Context and Purpose: did the student understand the purpose of the work and place it in its appropriate scientific context?	The student understood the aim of his/her research project and was able provide a broader context.	The student understood the aim of the work but was unable put it into a broader context.	The student <u>partially</u> understood the aim and context of the research project.	The student <u>partially</u> understood <u>only</u> the aim of the research project.	The student presented no aims or contextual information.
3. Depth: was the subject treated in detail and not superficially?	The student covered all the necessary topics in depth.	The student covered most topics, and all essential ones, in depth.	The student covered some topics in depth, but not all of the essential ones.	The student covered few topics in depth.	The student covered all topics only at a superficial level.
Presentation					
4. Organization	The presentation followed a logical sequence, and flowed smoothly from one section to the next.	The order of the presentation was logical, but the transitions were not all smooth.	The order of presentation was mostly good, but was awkward in one or two places.	The organization was awkward or jarring in several places.	The topics in the presentation were presented poorly, with no logical sequencing evident.
5. Delivery	The delivery was smooth, confident, well paced, and at the right volume.	There was some awkwardness in pacing or volume.	The delivery was poor enough to be noticeable but not poor enough to impair understanding.	Poor delivery impaired the clarity of the presentation.	The delivery prevented clear understanding of the presentation.
6. Use of Visual Aids	Visual aids were clearly laid out, appropriate in number, and easily legible. Figures and tables from outside sources were	Most slides were good but some lacked clarity.	Slides were difficult to read and consistently had too much or too little information, but did not substantially impair	Slides were sufficiently poor to make the material difficult to understand.	Slides showed little or no effort, poor organization, are unattractive, are inappropriate in number, and did not have the



	5- Excellent	4 – Very good	3 – Good	2 - Poor	1 – Very poor
	appropriately cited.		understanding of the material.		appropriate amount of information. Citations were lacking for figures and tables from outside sources.
7. Clarity	Everything was expressed very clearly.	All but the most difficult concepts were clearly explained.	Several points were not clearly explained.	Much of the presentation was difficult to understand.	The presentation was extremely difficult to understand.

Thesis Research Rubric

	5- Excellent	4 – Very good	3 – Good	2 - Poor	1 – Very poor
1. Research progress	Significant progress has been made in the student's research	A lot of progress has been made in the student's research	Good progress has been made in the student's research	Some progress has been made in the student's research	Little or no progress has been made in the student's research
2. Data management and analysis	All data is carefully organized and appropriate analysis has been done	Data is carefully organized but not full analyzed	Data is either poorly organized or analysis is incomplete	Data is poorly organized and analysis is simplistic	Data is not organized and no analysis has been done
3. Problem solving	Able to identify and analyze problems and indicate possible solutions	Able to identify and analyze problems but cannot always give possible solutions	Able to identify and analyze problems but lacks clarity on possible solutions	Able to identify problems but struggles in analysis and solutions	Rarely identifies problems making analysis and problem solving impossible
4. Critical and creative thinking	Thinks clearly making evidence based deductions, and explores new ideas	Thinks clearly and deductively but struggles to create new ideas	Thinking sometimes confused with few deductions or ability to create new ideas	Struggles to think clearly and make deductions and/or create new ideas	Thinking often confused, rarely makes deductions or create new ideas
5. Accountability and responsibility	Remains focused on the task, is self-directed and follows through on assigned tasks	Mostly focuses on the task, lacks self-direction and may not always follow through on tasks	Needs reminding to focus and stay on task and often lacks self-direction	Often strays from the task and lacks self-direction	Rarely focuses on the task and demonstrates little or no self-direction



	5- Excellent	4 – Very good	3 – Good	2 - Poor	1 – Very poor
6. Time management	Routinely uses time well and completes projects on time	Uses time well but may procrastinate on part of the project	Tends to waste time but does complete the project on time	Often wastes time leaving several tasks incomplete by the deadline	Rarely completes tasks on time and needs deadlines adjusted

Thesis Report Rubric

	5- Excellent	4 – Very good	3 – Good	2 - Poor	1 – Very poor
1. Research background	All of the relevant background is covered in detail	Most of the relevant background is covered in detail	There are gaps in the background	Only selected background is covered in detail	Little or no background is covered
2. Experimental / Methodology	The experiments and methodology are well designed and described	Most experiments and methodology are well designed and described	Parts are not well designed or described	Significant areas are poorly designed or described	There is no experimental design or methodology
3. Results	All results are clearly and concisely presented	All results are presented but some not clearly	Most results are presented, generally clearly	Significant numbers of results are poorly presented	Few, if any results are presented
4. Discussion and analysis	All results are discussed and analyzed in detail	All results are discussed but analysis is superficial	Most results are discussed and analysis is simplistic	Limited results are discussed and analyzed	No real discussion or analysis is present
5. Presentation	The report is neat, figures are clear, tables and text correctly formatted, and references consistent	The report is mostly well presented but figures, tables, text or references are untidy or incorrectly formatted	Parts of the report are not well presented or formatted	Significant areas of the report are poorly presented and formatted	Almost all of the report is poorly presented and formatted

Total score 25 points –Borderline scores can be given for example between good and very good would be awarded 3.5 points. All points from each section have equal weight and are additive.



Comments

Borderline scores can be given for example between good and very good would be awarded 3.5 points.

1. **Points 1 and 2** in the **Thesis research rubric** relate directly to the research done by the student and is termed the **thesis research progress score**.
2. **Points 3-6** are **soft skills** that the student should acquire during the course of their studies and is called the **soft skills score**.
3. In determining the research progress and data management and analysis score due thought should be given to where the student is in their studies. For instance near the end of their studies a student would be expected to have finished practical work and will focus more on data analysis. The appropriate weightings for each program are:

Table 1 MSc program weighting (research and coursework: 24 months program, 18 credits two term system)

Term	1 st	2 nd	3 rd	4 th
① Research progress	20%	35%	35%	10%
② Data management and analysis	15%	25%	30%	30%
③ Soft skills	60%	70%	75%	80%

4. The total score is calculated as follows:
 - Points from the **Thesis report rubric** are added together and then divided by the total of 25 points. This represents **30%** of the thesis score.
 - Points 1 and 2 in **Thesis research rubric** represent **50%** of the thesis score. The weighting of points 1 and 2 depends on their term.
 - Points 3-6 in **Thesis research rubric** represent **10%** of the thesis score. If student reach the percentage of each term, student will have full score. However, if not will be proportion of their achievement.
 - The **progress seminar** represents **10%** of the thesis score.

As an example, a MSc. student (Type A2) in term 1 achieving a score of 4 for points 1 and 2 in the **Thesis research rubric** would have the following score:

① Research progress = 4 points = $\{(4/5)*20\% \} = 16\%$

② Data management and analysis = 4 points = $\{(4/5)*15\% \} = 12\%$

Total = 16% + 12% = 28% out of a possible 35% (addition of 1) and 2) items in 1st term column in Table 1) = $\{28/35\}*50 = 40\%$

And he/she is achieving a score of 3 for points 3-4 and 2 for points 5-6 in the **Thesis research rubric** would have the following score:

③ Soft skills = 3 + 3 + 2 + 2 = $\{(10/20)*100\% \} = 50\%$ which is below the expectation of 60% in his/her 1st term . Therefore, the score = $(50/60)*10 = 8.3$



5. To calculate the total number of credits:

Total no. of credits awarded = {[Research score (50%) + Soft skills (10%) + Report score (30%) + Progress seminar (10%)]/100}*no. of credit registered

- For example, 4 points from each section for the report plus 6/10 for the progress seminar gives. In this case the total score = 40 + 8.3 + 24 + 6 = 78.3%. According to Table 2, we need to calculate the credits awarded by following explanation:

Credits awarded = {(40 + 8.3 + 24 + 6)/100}*2 credits = 1.57 credits → 2 credits. **Numbers should be rounded up, unless there are significantly low scores in the soft skills section (points 3-6 in the Thesis research rubric). In this case the postgraduate committee can round scores down.**

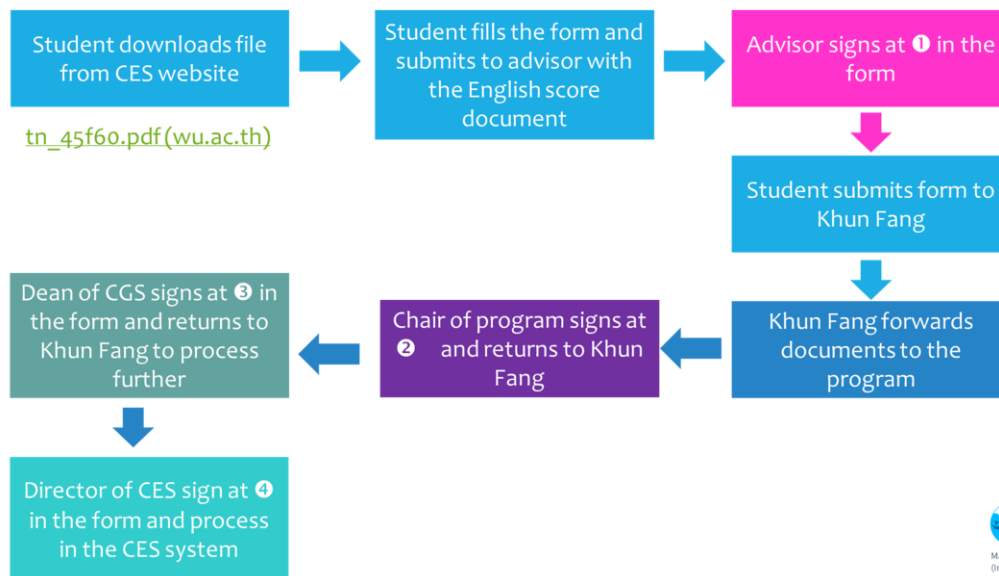
Table 2 Guideline for credits awarded

Total score	Credits awarded
< 20%	0
20%-85%	Total no. of credits awarded = {[Research score (50%) + Soft skills (10%) + Report score (30%) + Progress seminar (10%)]/100}*no. of credit registered
> 85%	Full credits registered

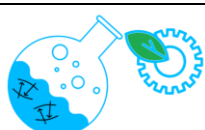
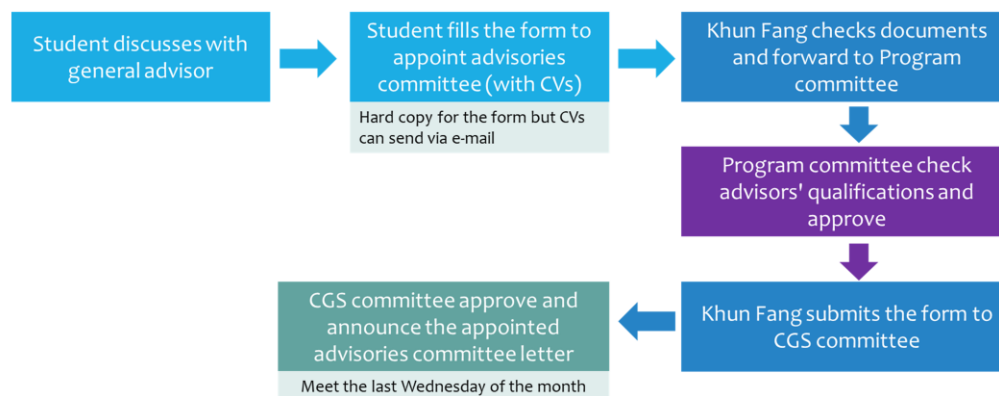


Flow chart for all documents submission

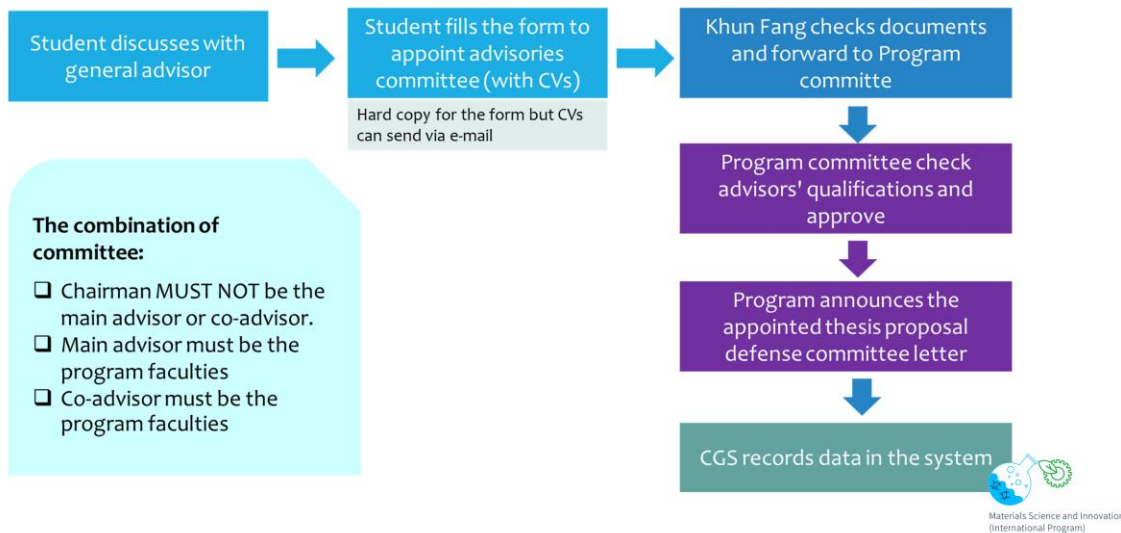
English Proficiency Form Submission



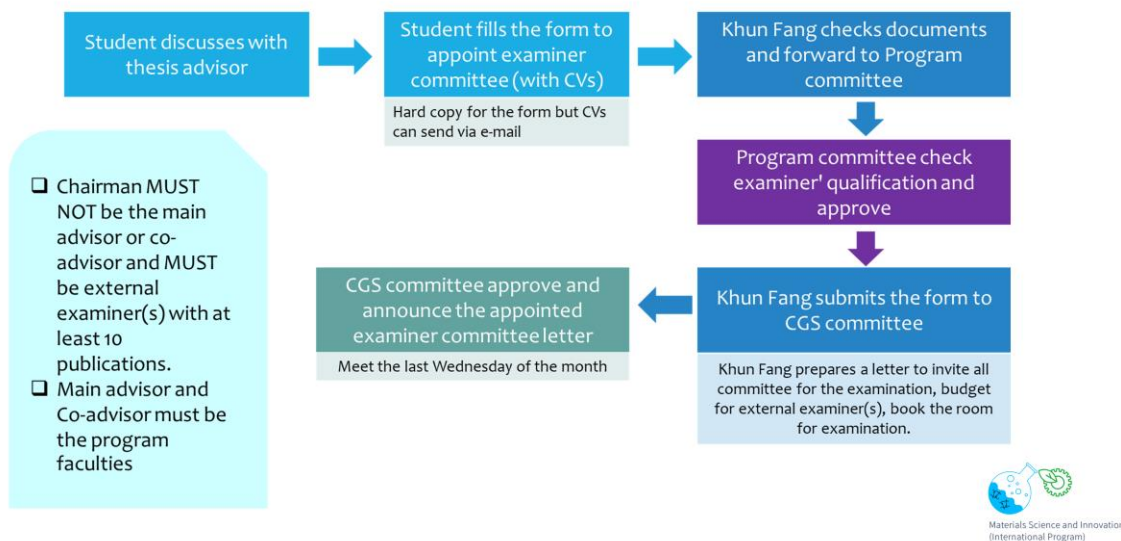
Appointment for Advisories Committee



Appointment for Thesis Proposal Defense Committee



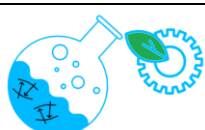
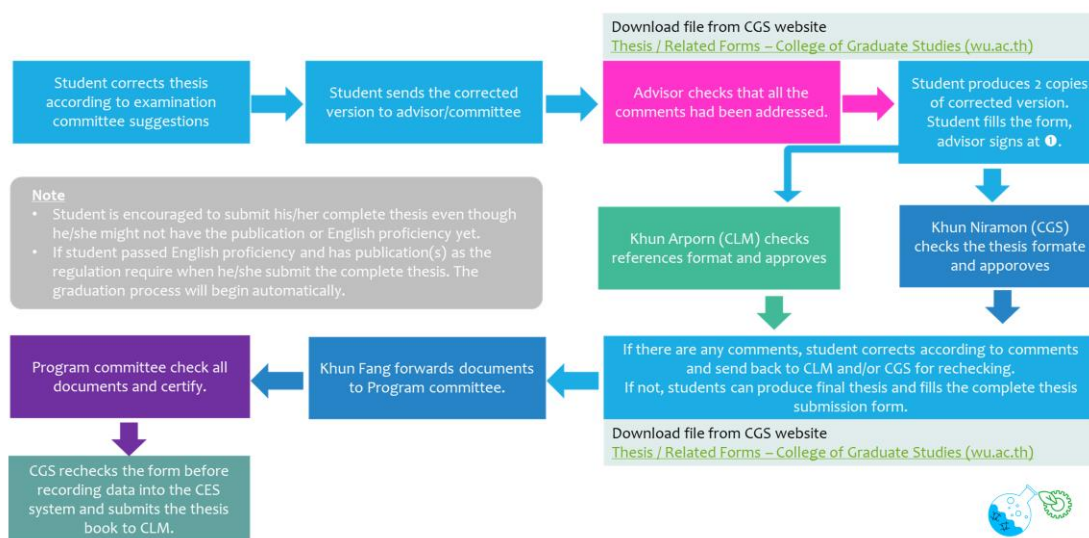
Appointment for Thesis Defense Committee



Thesis Examination Report



Complete Thesis Submission



Publication Submission & Graduation

In case student submitted the complete thesis before publication has been accepted/published.

