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## 1. 修業年限 Years of Study

1. 博士班修業期限以二至七年為限。但以在職進修身分錄取或應修畢業學分數達六十學分以上之研究生未在規定修業期限修滿應修課程或未完成學位論文者，得酌予延長其修業期限，最高以二年為限。

The duration of the study is limited to two to seven years. However, part-time students or students who require 60 or more credits for graduation but cannot complete the required courses or the dissertation within the prescribed period of study may extend the period of their study for a maximum of two years.

2. 逕行修讀博士學位者，自轉入博士班起，其修業期限依照前項規定辦理。

The duration of study for a direct Ph.D. student after enrolment into the direct doctoral program is subjected to the same regulations in the preceding paragraph. (A direct Ph.D. student is a student transferred from the master's degree program to the doctoral program.)

## 2. 學分規定 Credit Requirement Regulations

1. 入博士班後應至少修滿 18 學分，可在本系所或相關系所開授之課程中選讀，但不包括專題討論、論文、外國語文或入博士班以前修讀之學分，若各學術分組有更嚴格之要求從其規定【博士班研究生必修科目表如下頁】。

Students in the doctoral program must complete a minimum of 18 credits after enrolment, which may include credits earned through courses offered in the department or by other relevant departments, but must exclude credits of division seminars, dissertations, and foreign language courses, and credits earned prior to enrolment. Additional or stricter division regulations must be followed.

2. 修習科目應包括入學前由甄試工作小組指定之必選科目，此項必選科目之學分，不能充抵前項規定內之學分數。

Additional course requirements made by the Admission Committee, if any, must be completed and of which credits cannot be counted towards achieving credit requirements.

3. 博士班研究生每學期課程之選定，必須經指導教授或導師同意，否則不予承認。

Courses selection of a student must be approved by the student's dissertation supervisor or academic advisor.

4. 直攻博士學位者，自轉入博士班起，其學分規定依上述規定辦理

A direct Ph.D. student must follow the foregoing credit requirements after enrolment into the doctoral program.

## 3. 臺大土木系博士班研究生各組必修科目及學分規定

## Division Regulations on Required Courses and Credits

主修學門 Division	必修科目名稱 Required Subjects	應修最低畢業學分數 Minimum Credit Requirement towards Graduation	備註 Remarks
大地工程 Geotechnical Engineering	000 90010 學術倫理 Academic Ethics 521 D0010 博士論文 Dissertation (Ph.D.) 521 M0180 大地工程專題討論(四學期) Seminar on Geotechnical Engineering (4 semesters, the credits could not be accounted for credits required toward graduation)	一般入學生：18 逕修博士生：30(含碩士班期間所修學分)  Standard requirement: 18 credits. Requirement for direct Ph.D. students: 30 (including credits earned during the Master's degree program)	1. 大學部(U字頭以外)課程之學分數不計入應修最低畢業學分數。  Credits earned through undergraduate level courses (excluding courses with U code in the Curriculum Identity Number) cannot be counted towards the minimum credit requirement.
測量及空間資訊 Surveying and Geospatial Engineering	000 90010 學術倫理 Academic Ethics 521 D0010 博士論文 Dissertation (Ph.D.) 521 M6430 測量專題討論(六學期) Seminars on Surveying (6 semesters)	一般入學生：18 逕修博士生：30(含碩士班期間所修學分)  Standard requirement: 18 Requirement for direct Ph.D. students: 30 (including credits earned during the Master's degree program)	2. 各組應修最低畢業學分數不包含論文及專題討論。  The minimum credit requirement cannot include credits earned for dissertation and seminars.

結構工程 Structural Engineering	000 90010 學術倫理 Academic Ethics 521 D0010 博士論文 Dissertation (Ph.D.) 521 M6200 結構力學專題討論(四學期) Seminars in Structural Engineering (4 semesters)	一般入學生：24 逕修博士生：42(含碩士班期間所修學分)  Standard requirement: 24 Requirement for direct Ph.D. students: 42 (including credits earned during the Master's degree program)	3. 博士生若依本校交換計畫到科技部、教育部之補助出國進修，可提出相關書面申請，並經指導教授及所長同意，則得於出國交換或進修期間以修課及格之課程抵免當學期之專題研究討論。(104.12.07 課程委員會通過)  Students enrolled in the doctoral program that plan to apply for the international exchange program sponsored by the Ministry of Science and Technology or Ministry of Education, upon approval from the dissertation supervisor as well as the department chair may have the seminar exempted for the semester, covering the period of exchange or sabbatical
水利工程 Hydraulic Engineering	000 90010 學術倫理 Academic Ethics 521 D0010 博士論文 Dissertation (Ph.D.) 521 M0040 水利工程專題討論(四學期) Seminars in Water Resources Engineering (4 semesters)	一般入學生：24 逕修博士生：42(含碩士班期間所修學分)  Standard requirement: 24 Requirement for direct Ph.D. students: 42 (including credits earned during the Master's degree program)	
交通工程 Transportation Engineering	000 90010 學術倫理 Academic Ethics 521 D0010 博士論文 Dissertation (Ph.D.) 521 M0320 運輸工程專題討論(四學期) Seminar on Transportation Engineering (4 semesters)	一般入學生：18 逕修博士生：30(含碩士班期間所修學分)  Standard requirement: 18 Requirement for direct Ph.D. students: 30 (including credits earned during the Master's degree program)	

<p>電腦輔助工程 Computer Aided Engineering (CAE)</p>	<p>000 90010 學術倫理 Academic Ethics</p> <p>521 D0010 博士論文 Dissertation (Ph.D.)</p> <p>521 M6230 電腦輔助工程專題討論 (六學期) Computer-aided Engineering Seminar (6 semesters)</p> <p>521 M6620 英文寫作基礎 (若曾修習學術英文寫作或於下列以母語為 英文的國家之大學取得學位可免修習本課： 澳洲、加拿大、蓋亞那共和國、愛爾蘭、紐 西蘭、南非共和國、英國、美國和西印度群 島) Fundamentals of English Writing (Exemption may be granted if one of the following English language requirements is fulfilled: 1. You have taken and passed the course Academic English Writing; 2. You have successfully completed a degree at a University in one of the following native English speaking countries: Australia, Canada, Guyana, Ireland, New Zealand, South Africa, United Kingdom, United States of America and West Indies.)</p>	<p>一般入學生：18 逕修博士生：30(含碩士班期間所修學分)</p> <p>Standard requirement: 18 Requirement for direct Ph.D. students: 30 (including credits earned during the Master's program)</p>	<p>overseas.</p>
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營建工程與管理 <b>Construction Engineering and Management (CEM)</b>	000 90010 學術倫理 Academic Ethics 521 D0010 博士論文 Dissertation (Ph.D.) 521 M5950 營建管理專題討論(六學期) Seminars on Construction Management (6 semesters) 521 M6300 營建管理專案研究 Independent Study on Construction Management	一般入學生：18 逕修博士生：30(含碩士班期間所修學分)  Standard requirement: 18 Requirement for direct Ph.D. students: 30 (including credits earned during the Master's program)	
人工智慧 <b>AI for Engineering Application</b>	000 90010 學術倫理 Academic Ethics 521 D0010 博士論文 Dissertation (Ph.D.) 521 M0330 人工智慧工程應用專題討論 (四學期) Seminar on Artificial Intelligence for Engineering Applications (4 semesters)	一般入學生：18 逕修博士生：30(含碩士班期間所修學分)  Standard requirement: 18 credits. Requirement for direct Ph.D. students: 30 (including credits earned during the Master's degree program)	

## 4. 各組修課補充規定 Supplementary Division Regulations on Study Requirements

主修學門 Division	各組修課補充規定 Supplementary Regulations
大地組 Geotechnical Engineering	<p><b>107 學年度第二學期前:</b> 無特別規定  <b>Prior to the second semester of Academic Year 2018:</b> No supplementary regulations.</p> <p><b>108 學年度第一學期起適用</b>  <b>Began from the first semester of Academic Year 2019</b></p> <p>大地組現行博士班畢業學分為 <b>18</b> 學分，其中必須滿足三大領域的最低修習學分要求，分別為共同領域(大地材料組成律模式、大地工程之數值分析、大地工程可靠度分析與設計、大地工程實務)最低修習學分為 <b>6</b> 學分；土壤領域(中等土壤力學、土壤動力學、大地地震工程、土壤行為學、地工合成材料之應用、基礎設計與施工一、深開挖設計與分析)最低修習學分為 <b>9</b> 學分；岩石領域(岩石力學、高等工程地質、隧道工程)最低修習學分為 <b>3</b> 學分。上述修課規定若學生於碩士班期間已通過上述課程者則不在此限，亦即可抵課程但不抵學分。(108.8.19 學術委員會修訂、109.2.2 組務會議修正通過)</p> <p>The total number of graduation credits is 18 credits. Students must meet the credit requirements in three major categories. Six credits are required from the common category, including: Constitutive Law of Geomaterials, Numerical Methods in Geotechnical Engineering, Geotechnical Reliability Analysis and Reliability-based Design, and Geotechnical Engineering Practice. Nine credits are required in the category of soil mechanics, including: Intermediate Soil Mechanics, Soil Dynamics and Foundation Vibration, Geotechnical Earthquake Engineering, Soil Behavior, Application of Geosynthetics, and Foundation Design and Construction (I). Three credits are required in the category of rock mechanics, including: Rock Mechanics, Advanced Engineering Geology, and Tunnel</p>

Engineering. **Students who have passed the courses during their Master's degree study may apply for exemption from the course requirements above, but the total required number of credits is unchanged.**

109 學年度第一學期起適用

Began from the first semester of Academic Year 2020

大地工程組現行博士班畢業學分為 18 學分，其中必須滿足三大領域的最低修習學分要求，分別為共同領域(大地材料組成律模式、大地工程之數值分析、大地工程可靠度分析與設計、大地工程實務)最低修習學分為 6 學分；土壤領域(中等土壤力學、土壤動力學、大地地震工程、土壤行為學、地工合成材料之應用、基礎設計與施工一、深開挖設計與分析)最低修習學分為 9 學分；岩石領域(岩石力學、高等工程地質、隧道工程)最低修習學分為 3 學分。上述修課規定若學生於碩士班期間已通過上述課程且等第成績達 A 者則不在此限，亦即可抵課程但不抵學分。(110.1.14 組務會議修正通過)

The total number of graduation credits is 18 credits. Students must meet the credit requirements in three major categories. Six credits are required from the common category, including: Constitutive Law of Geomaterials, Numerical Methods in Geotechnical Engineering, Geotechnical Reliability Analysis and Reliability-based Design, and Geotechnical Engineering Practice. Nine credits are required in the category of soil mechanics, including: Intermediate Soil Mechanics, Soil Dynamics and Foundation Vibration, Geotechnical Earthquake Engineering, Soil Behavior, Application of Geosynthetics, and Foundation Design and Construction (I). Three credits are required in the category of rock mechanics, including: Rock Mechanics, Advanced Engineering Geology, and Tunnel Engineering. **Students who have obtain the course grades of A or above during their Master's degree study may apply for exemption from the course requirements above, but the total required number of credits is unchanged.**

結構組 Structural Engineering	<p>1. 博士班學生畢業前最低修課標準為 24 學分，應以不重複修習碩士階段已修過課程為原則。          Students must complete a minimum of 24 credits towards completion of the degree, and are not permitted to retake the courses that have already been taken towards their Master's degree.</p> <p>2. 在應修畢之 24 學分中，至少 6 學分為第二專長領域。第二專長領域之修課，由非本系之教師擔任其修課指導老師。修課指導老師由該生之指導教授指定，負責該研究生第二專長領域之修課指導。          At least 6 credits of the 24 credits should be earned in a minor discipline. Courses taken in the minor discipline should be determined by a course advisor, who is a professor from outside of the department who is assigned by the dissertation supervisor of the student, and is responsible for providing guidance in course selections in the minor discipline.</p> <p>3. 第二專長領域之修課需為一系列之相關課程，且其中至少包括一門研究所課程（U 或 M 或 D 字頭課程）。          Courses to take in the minor discipline should be a series of related courses, including at least one graduate course (i.e., a course with U, M, or D code in the Curriculum Identity Number).</p> <p>4. 每學年結束後，由組務會議追蹤博士班研究生第二專長領域之修課情形。          After each academic year, the performance of the students in their minor discipline for the past academic year will be reviewed in division affairs meetings.</p>
水利組 Hydraulic Engineering	<p>授權指導教授全權規定負責其指導學生應選科目內容。          A student's dissertation supervisor has authority over and is responsible for the student's course selection.</p>
交通組 Transportation Engineering	<p>無特別規定          No division-specific regulations</p>
電輔組 Computer Aided Engineering	<p>1. 除主修『電腦輔助工程』外，必須於本所其他領域或相關研究所中選擇一輔修領域。          In addition to Computer Aided Engineering, students must choose a minor discipline in other divisions or related graduate institutes.</p>

	<p>2.必選科目：於輔修領域選修 9 學分之課程（由指導教授與博士生共同討論決定）。</p> <p>Required courses: Students must complete 9 credits for courses in the minor discipline and the courses are selected jointly by students and their dissertation supervisors.</p> <p>3.選修科目：由博士生與指導教授共同討論決定。</p> <p>Elective courses will be selected jointly by students and their dissertation supervisors.</p>
營管組 Construction Engineering and Management	<p>須修習本組各專任教師至少一門課。專任老師含學生入學後三年內(含)新加入本組之老師。</p> <p>A student is required to take at least one course from each of the full-time professors of this division, including those joining the division within three years after the admission of the student.</p>
測量及空間資訊組 Surveying and Geospatial Engineering	<p>選修課程應由博士班研究生與其指導教授共同商議。</p> <p>Course selection should be determined jointly by the student and the student's dissertation supervisor.</p>
人工智慧工程領域 AI for Engineering Applications	<p>授權指導教授全權規定負責其指導學生應選科目內容。</p> <p>A student's dissertation supervisor has authority over and is responsible for the student's course selection.</p>

## 5. 資格考試規定 Doctoral Qualifying Examination Regulations

1. 博士班研究生經指導教授同意，並提出論文研究計畫，即可申請參加資格考試，惟若各學術分組另有規定，則從其規定；不及格者得申請重考，經重考一次仍不及格者，應簽請校方予以退學。

A student who has the approval of the dissertation supervisor and has submitted a research proposal may apply for the qualifying examination. If there are any further regulations by specific divisions, those regulations shall be followed. Students who failed the first qualifying examination may apply for a second examination. Students who failed both examinations will be expelled from the university.

2. 一般生除特殊情況外應於進入博士班就讀二年內申請參加資格考試，並於就讀三年內完成資格考試，各學術分組如有更短年限之要求，從其規定。未於規定年限內通過資格考試者，應簽請校方予以退學，以上特殊情況由學術委員會認定之。

Full-time students should apply for the qualifying examination within the first two academic years of study and pass the examination before the end of the third year except under special circumstances. If there are stricter regulations by specific divisions, those regulations shall be followed. Students who failed to pass the qualifying examination within the prescribed period will be expelled from the university. The aforementioned special circumstances are determined by the Academic Committee.

3. 在職生除特殊情況外應於進入博士班就讀三年內參加資格考試，並於就讀四年內完成資格考試，各學術分組如有更短年限之要求，從其規定。未於規定期限內通過資格考試者，應簽請校方予以退學，以上特殊情況由學術委員會認定之。

Part-time students should apply for the qualifying examination within the first three academic years of study and pass the examination before the end of the fourth year except under special circumstances. If there are stricter regulations by specific divisions, those regulations shall be followed. Students who failed to pass the qualifying examination within the prescribed period will be expelled from the university. The aforementioned special circumstances are determined by the Academic Committee.

4. 資格考試由各學術分組組織委員會辦理，委員至少三人，如有非指導委員之外系或外校委員，其人選應經本系學術委員會同意。

The qualifying examination is held by the Qualifying Examination Committee organized by the division to which the student belongs. The committee must consist of at least three members. Any member who is not a faculty member of the department, unless the member serves on the student's Advisory Committee, must be approved in advance by the Academic Committee.

5. 資格考包括筆試與口試兩部份，筆試內容為專門學科，考試內容至少包括兩大學科，選考之學科由指導教授依學生之論文研究主題建議並經學術分組同意之，於成立指導委員會同時，經學術委員會同意。

The qualifying examination should consist of a written and an oral examination. The written examination covers academic subjects in civil engineering exclusively and includes at least two subjects. The subjects of the written examination are determined by the student's dissertation supervisor based on the research topic of the dissertation and approved by the division to which the student belongs. The subjects must be further approved by the Academic Committee when the student's Advisory Committee is established.

6. 博士班資格考試應至遲於學位考試前一學期完成，其申請及考試日期於每學期開學初公告【博士班研究生資格考試科目表】

The qualifying examination must be passed at least one semester before the degree examination. The application deadline as well as the date of the qualifying examination will be announced by the department at the beginning of every semester.

## 6. 各組資格考試補充規定

## Supplementary Division Regulations on Doctoral Qualifying Examinations

組別 Division	資格考規定 Supplementary Regulations
大地組 Geotechnical Engineering	<p>原則上本組資格考筆試部分於學期初舉行，口試部分則於學期末舉行。</p> <p>In principle, the written examination is held at the beginning of the semester, and the oral examination is held at the end of the semester.</p>
結構組 Structural Engineering	<p>106 學年度第一學期前: 無特別規定</p> <p>Prior to the first semester of Academic Year 2017: No supplementary regulations.</p> <p>106 學年度第二學期起適用</p> <p>Began from the second semester of Academic Year 2017:</p> <p>1 博士班資格考筆試通過標準為三科皆 70 分以上；其中考試科目修課成績達 A-或以上(需為由本組研究所或應用力學研究所開設課程)，經指導教授同意得提出申請，結構組組務會議同意後該科目可免試視為通過，最多以抵免一科為限。(106-3 學術委員會修訂)</p> <p>The written examination is passed if all the scores of the three subjects are 70 points or above. If a student passes a course of one of the three subjects that is offered by the department or the Institute of Applied Mechanics with a grade of A- or above, the subject is considered passed and exempted from the requirements of the written examination, with the approval of the dissertation supervisor and the division committee of structural engineering. At most one subject can be exempted.</p>

	<p>2 本組一般生除特殊情況外應於進入博士班就讀三個學期內申請參加資格考試，並於就讀四個學期內完成資格考試。未於規定年限內通過資格考試者，本組應報請所方予以退學；若有特殊情況，應報請學術委員會認定之。(106-3 學術委員會修訂)</p> <p>Full-time students should apply for the qualifying examination within the first three semesters after enrollment and should have passed it within the first four semesters, with the exception of extraordinary circumstances. Students who failed in passing the qualifying examination within the prescribed duration will be expelled from the university. The aforementioned extraordinary circumstances are determined by the Academic Committee.</p>
<p>水利組 Hydraulic Engineering</p>	<p>無特別規定 No supplementary regulations</p>
<p>交通組 Transportation Engineering</p>	<p>1 專門學科考試分為兩部分：一為筆試、一為口試。筆試科目包括「運輸系統規劃」、「運輸系統設計」、「運輸系統分析」三科，三科皆通過後再考「研究方法」筆試，四科筆試合格後方能進行口試。學生獲口試資格者於一週後進行口試；口試內容包括研究計畫書、專門學科及相關研究領域，口試未通過者得於該學期規定期限內重考第二次。口試通過方認定學科考試通過。</p> <p>The qualifying examination consists of a written and an oral examination. For the written examination, students need to first take the examination of three subjects: Transportation System Planning, Transportation System Design, and Transportation System Analysis. After all three subjects have been passed, then students can take the written examination for Research Methodology. Students are only permitted to take the oral examination after all four subjects have been passed. The oral examination will be held a week after students become qualified for the oral examination, which covers the research proposal, specialized subjects, and related research areas. Students who fail the oral examination must retake the oral examination within a designated time during the same semester.</p>

	<p>Students are regarded to have passed the qualifying examination and obtained Ph.D. candidacy only when the oral examination is passed.</p> <p>2 各科筆試以開書或閉書方式（依試題上之規定）在指定場所舉行，各科涵蓋範圍以相關課程及考生主、副修領域為原則，其中「研究方法」係撰寫研究計畫書。考試時間以運輸系統規劃、運輸系統設計及運輸系統分析三科在同一天完成，研究方法一科在另一天完成，各科之筆試時間長短依試題之規定。</p> <p>Subjects covered by the written examination will be examined in either an open-book or a closed-book manner (according to rules specific to each of the subjects). The written examination will be held in a predetermined location. The content covered in each subject is primarily based on the relevant courses offered in the program and the student's research fields. Research Methodology, in particular, will be examined with regard to writing research proposals. The first three subjects, i.e., Transportation System Planning, Transportation System Design, and Transportation System Analysis, will be tested during the same day, while the fourth subject, Research Methodology, will be tested on another day. The time duration for each subject will be determined by their respective regulations.</p>
<p>電輔組 Computer Aided Engineering</p>	<p>1 筆試不及格者，得就不及格之科目申請重考一次。筆試皆及格後，方能進行口試。口試不及格亦得申請重考一次。</p> <p>A student who fails any of the subjects of the written examination can apply for a retest on the failed subject (once only). The oral examination will only be permitted after all the subjects in the written examination have been passed. A student who fails the oral examination can apply for a retest (once only).</p> <p>2 各科筆試以開書為原則，若需閉書考試，則會事先公告。</p> <p>All written examinations are open-book unless announced otherwise in advance.</p>

<p>營管組 Construction Engineering and Management</p>	<p>1 資格考每學年舉行一次，訂於每學年第二學期舉行。博士班申請資格考試以博二為原則，如有特殊情形，經指導教授同意者，得延長一年，資格考第一次如未通過，應在次學年度再考，兩次不通過者即應退學。</p> <p>A qualifying examination will be held in the second semester every academic year. Full-time students should apply for the qualifying examination in the second year after enrollment, with the exception of extraordinary circumstances. In cases of extraordinary circumstances, students may defer the examination for one year with the approval of the dissertation supervisor. Students who have failed the qualifying examination should test a second examination the following year. Students who have failed for the second time will be expelled from the university.</p> <p>2 資格考分為兩部分，一為筆試，一為口試，筆試通過後方能進行口試。筆試部分為學科考試，口試部分則為論文研究計畫，資格考第一次未通過者，其第二次考試內容得依第一次考試成績由考試委員建議下列方式擇一進行：(1)重考筆試和口試 (2)僅重考口試。</p> <p>The qualifying examination consists of two parts, a written and an oral examination. Students can only proceed to the oral examination after passing the written examination. Academic subjects are tested in the written examination and the students' research proposals are examined in the oral examination. For students who fail to pass the qualifying examination at the first time, the format of the second qualifying examination could be (1) retake both written and oral examinations or (2) retake oral examination only, which is decided by the Qualifying Examination Committee based on the outcome of the first qualifying examination.</p>
<p>測量及空間資訊組 Surveying and Geospatial Engineering</p>	<p>1 博士班研究生以博二申請參加專門學科考試為原則。如有特殊情形，經指導教授同意，並報請學術委員會核定後（在職生免核定），可延長一年。</p>

	<p>A student should apply for the qualifying examination during their second year in the program. In cases of special circumstances, the time to apply for the qualification examination may be deferred for one year with approval from the student's dissertation supervisor. For full-time students, this deferral must be further approved by the Academic Committee. The approval by the Academic Committee is not necessary for part-time students.</p> <p>2 專門學科考試分為筆試及口試兩部分；筆試所有科目通過後方能進行口試 The qualifying examination consists of a written and an oral examination. Students can only proceed to the oral examination after passing the written examination.</p> <p>3 筆試科目：「誤差理論」、「遙感探測」、「數值攝影測量」、「衛星大地測量」、「地理資訊系統」（5科選3科） The subjects of the written examination are three out of the following five subjects: Theory of Error, Remote Sensing, Digital Photogrammetry, Satellite Geodesy, and Geographic Information System.</p> <p>4 口試內容包括研究計畫書、專門學科及相關研究領域。 The oral examination covers the research proposal, academic subjects and related research areas.</p>
<p>人工智慧工程領域 AI for Engineering Applications</p>	<p>1 筆試不及格者，得就不及格之科目申請重考一次。筆試皆及格後，方能進行口試。口試不及格亦得申請重考一次。 A student who fails any of the subjects of the written examination can apply for a retest on the failed subject (once only). The oral examination will only be permitted after all the subjects in the written examination have been passed. A student who fails the oral examination can apply for a retest (once only)</p> <p>2 筆試科目為：(1)「人工智慧技術」、(2)「人工智慧於工程上之應用」與(3)「由本系認可之博士班資格考考科中擇一科目進行考試」</p>

	<p>The subjects of the written examination are (1) Artificial intelligence techniques, (2) engineering applications of Artificial Intelligence, and (3) Choose one subject from the doctoral qualification exams recognized by NTUCE.</p>
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## 7. 臺灣大學土木工程學系研究所博士班資格考試科目表

### Subjects of Doctoral Qualifying Examination

資格考試事宜請詳閱本所「博士學位候選人資格考試實施辦法」之規定。各組的筆試科目詳列如下表。

1. For details please read the Department's "Guidelines for the Implementation of Doctoral Qualifying Examination".
2. The subjects of the written examination for each division are listed below. (The examination covers a wide range of subject matter, which requires the student to have extensive knowledge of his/her field.)

學 門 Field	學 科 Subjects
大地工程 Geotechnical Engineering	1. 土壤力學 Soil Mechanics 2. 岩石力學 Rock Mechanics 3. 土壤動力學或工程地質學 (任選一科) Soil Dynamics and Foundation Vibration or Engineering Geology (Select either one)  94.10.14修定 Revised on 14 October 2005
結構工程 Structural Engineering	1. 結構動力學或高等混凝土學 Structural Dynamics or Advanced concrete Theory 2. 結構力學 Structural Mechanics (含彈性力學與塑性力學) (including Theory of Elasticity and Theory of Plasticity) 3. 結構學 Structural Theory (含高等結構學與有限元素法) (including Advanced Structural Theory and Finite Element

	<p>Method)  <b>共考三科 All three subjects are required.</b>  (適用於106學年度前入學學生)  (Applicable to students who entered the program before fall 2017)</p> <p>1. 結構動力學或高等混凝土學  Structural Dynamics or Advanced Concrete Theory</p> <p>2. 結構力學 Structural Mechanics  (含彈性力學與塑性力學)  (including Theory of Elasticity and Theory of Plasticity)</p> <p>3. 高等結構學或有限元素法  Advanced Structural Theory or Finite Element Method</p> <p><b>共考三科 All three subjects are required.</b>  (適用於 106 學年度入學學生)  (Applicable to students who entered the Program from fall 2017)</p> <p>106.10.3 修定 Revised on 3 October 2017</p>
<p>水 利 工 程  Hydraulic Engineering</p>	<p>1. 水利工程理論  Hydraulic Engineering Theories</p> <p>2. 水利工程方法論  Hydraulic Engineering Methodologies  (包括工數、統計、數值與實驗 including Engineering Mathematics, Statistics, Numerical Analysis, and Experiments)</p> <p>3. 水利工程應用  Hydraulic Engineering Applications</p> <p>94.09.26修定 Revised on 26 September 2005</p>
<p>交 通 工 程</p>	<p>1. 運輸系統規劃  Transportation System Planning</p>

<p>Transportation Engineering</p>	<p>2. 運輸系統設計 Transportation System Design 3. 運輸系統分析 Transportation System Analysis 4. 研究方法 Research Methodology</p>
<p>營建工程與管理 Construction Engineering and Management</p>	<p>1. 工程專案管理 Project Management for Construction 2. 營建財務 Construction Finance 3. 計量實證研究方法論 Econometric and Empirical Research Methodology 以上皆為必考 <b>All three subjects are required</b> 108.11.05修定 Revised on 5 November 2019</p>
<p>電腦輔助工程 Computer-Aided Engineering (CAE)</p>	<p>1. CAE 應用 CAE Applications 2. CAE 技術 CAE Technology (數值分析或工程資訊管理或電腦視覺技術或自動化技術) (Numerical Analysis, Engineering Information Management, Engineering Visualization, or Automation and Robotics) 3. CAE 系統開發 CAE Systems Development (軟體系統分析與設計或專案管理或人機介面設計) (Software Systems Analysis and Design, Project Management, or User Interface Design) 98.05.05修定 Revised on 5 May 2009</p>
<p>測量及空間資訊 Survey and Geospatial Engineering</p>	<p>1. 誤差理論 Error Theory 2. 遙感探測 Remote Sensing</p>

	<p>3. 數值攝影測量 Digital Photogrammetry  4. 衛星大地測量 Satellite Geodesy  5. 地理資訊系統  Geographic Information System  <b>以上 5 科選 3 科 Three subjects are selected out of the five listed above.</b></p> <p>98.09.04修定 Revised on 04 Sept 2009</p>
<p style="text-align: center;">人工智慧  AI for Engineering Applications</p>	<p>1. 人工智慧技術 Artificial Intelligence Techniques  2. 人工智慧於工程上之應用 Engineering Applications of Artificial Intelligence  3. 由本系認可之博士班資格考考科中擇一科目進行考試  Choose one subject from the doctoral qualification exams recognized by the Department</p> <p>109.04.09 修定 Revised on 09 April 2020</p>

三、申請時間:自即日起至\_\_年\_\_月\_\_日止,申請時需附論文研究計劃電子檔寄至 tcshen@ntu.edu.tw。

Application deadline: \_\_\_\_\_

To apply for the qualifying examination, please email your application form, research proposal to Mr. Shen (tcshen@ntu.edu.tw).

四、筆試時間: \_\_年\_\_月\_\_日(詳細時間地點另行通知)

Written examination date: \_\_\_\_\_ (The examination location will be announced later.)

五、口試由各組資格考試委員會辦理。

The oral examination is held by the Qualifying Examination Committee of the corresponding division.

## 8. Advisory Committee Regulations 指導委員會規定

1. 每位博士班學生之指導教授應於入學後第一學期內正式確定，如有特殊原因，得經系主任同意展期，展期以一學期為限。每位博士班研究生之指導委員會至遲應於入學後第一學年內成立，以指導該生之選課方向、論文及與博士學位有關事項，如有特殊原因，得經系主任同意展期，展期以一學期為限。

The dissertation supervisor for each student should be determined within the first semester after enrolment. In cases of special circumstances, the determination can be deferred for one semester, with approval from the department chair. The Advisory Committee for each student should be established within the first academic year after enrolment to provide guidance in course selection, dissertation, and other matters relevant to the pursuit of the doctoral degree. In cases of special circumstances, the establishment of the Advisory Committee can be deferred for one semester with the approval of the department chair.

2. 指導委員會之成員不宜過多，並以校內委員為主，由指導教授推薦，經本系學術委員會同意後組成之。

The number of members in the Advisory Committee should be confined and the majority of committee members should be affiliated to the university. Committee members are recommended by the dissertation supervisor and should be approved by the Academic Committee.

3. 博士班學生在未選定指導教授前，可先選定博士班導師（Academic Advisor）指導選課及有關事宜。如未選定則由各學術分組代為指定導師。

A student can choose an academic advisor responsible for providing guidance in course selection and other relevant matters before the dissertation supervisor of the student is determined. The division to which the student belongs can assign an academic advisor to the student if a student does not choose one.

4. 指導教授之更換，可由指導教授或學生向系主任提出申請，經學術委員會及系主任同意後行之。

To change the dissertation supervisor of a student, an application can be submitted by either the supervisor or student, to the department chair. The application must be approved by the Academic Committee and the department chair.

5. 指導委員會委員之更換由指導教授向系主任提出申請，經學術委員會及系主任同意後行之。

To substitute a member of the Advisory Committee, an application must be submitted by the dissertation supervisor

of the student to the department chair. The substitution must be approved by the Academic Committee and the department chair.

6. 指導教授或指導委員會委員如無法確實執行本規定，情形嚴重者經學術委員會三分之二以上委員之決議得更換之。

The dissertation supervisor or members on the Advisory Committee should enforce the relevant regulations involving the Advisory Committee. In case of serious violations of the regulations, the Academic Committee may replace the dissertation supervisor or the members on the Advisory Committee when votes from more than two-thirds of the Academic Committee members have been obtained.

## 9. 博士班督導規定 Regulations for Work during Study and Regular Assessments

1. 一般生未通過資格考前不得兼職，如需兼職，一、二年級以參與經本系同意之研究計畫為限，且每週不得超過二十小時；三年級（含）以上以不超過每週二十小時為限，且其工作性質須與主修課程及研究工作性質相近，並應於每學期初向學術委員會及系主任報備。惟三年級（含）以上且通過資格考試之研究生，得擔任專職工作，須將工作性質提請學術委員會及系主任審查，確認其與主修課程及研究工作性質相近，獲得同意後始得專職。

Full-time students cannot be employed prior to passing the qualifying examination except for the following two cases: (1) a first- or second-year student working for a research project that is approved by the department for no more than 20 hours per week and (2) a third-year student working for a research project closely related to the courses taken and research work and reporting the working status to the Academic Committee and department chair at the beginning of each semester. A student who is in the third year or higher and has passed the qualifying examination are allowed to be employed. However, the employment must be reviewed and approved by the Academic Committee and the department chair to ensure that the work closely related to the courses taken and research work.

2. 在職生之工作性質以報考時經同意者為限，惟如於特殊情形下須有所變更時，指導教授得提報學術委員會討論，以為必要之處置。

The job type of a part-time student is limited to the one that was approved when the student was admitted to the program. In cases of special circumstances where a change in the job type is necessary, the dissertation supervisor should report to the Academic Committee to evaluate the circumstances and take necessary measures.

3. 博士班研究生應每學年以書面方式自行向指導委員會報告研究工作之進展，並向學術委員會報備，必要時學術委員會得要求研究生或指導教授蒞會說明。

Each student must report the student's research progress to the Advisory Committee in written every academic year. The report must also be submitted to the Academic Committee for record purposes. If necessary, the Academic Committee may ask the student or the student's dissertation supervisor to attend the meetings to provide further details.

4. 研究生應確實遵守上列規定，如違反規定，由指導教授請其注意改善，情形嚴重者應提報系主任處理。

Students must be in compliance with all the aforementioned regulations involving work and assessment. If any of the regulations are violated, the advisor should ask the student to take necessary actions to improve or rectify the situation. In case of severe violation of regulations, the advisor should report the infraction to the department chair for further punitive actions.

5. 指導教授應嚴格執行上列規定，如違反規定，情形嚴重者提學術委員會討論。

The dissertation supervisor must strictly enforce all the aforementioned regulations involving work and assessment. Severe violations by the supervisor will be investigated by the Academic Committee.

## 10. 學位考規定 Degree Examination Regulations

1. 博士班研究生於入學後，申請論文口試前應至少有二篇與其博士論文相關之論文被國內外具水準之學術性期刊接受發表，並同時合乎以下規定：

- (1) 至少一篇論文被 SCI 或 SSCI 所收錄之期刊接受刊登，且該篇論文不得重複用於本系其他博士生學位考試相同條件之用。
- (2) 另一篇論文被 SCI 或 SSCI 或 EI 或學術委員會所認定之期刊接受刊登。

鼓勵博士班研究生親自於國際會議中以外文發表論文至少一次。

以上論文須與博士論文相關，又作者身分須註有『國立台灣大學土木工程學系』或等同之外文字樣。

Prior to applying for the oral defense of the doctoral dissertation, students must have had at least two publications related to the topic of their dissertations published in well-recognized national or international journals, with the following conditions being met:

- (1) At least one publication must be published in journals that are indexed by SCI or SSCI, which cannot be reused by any other doctoral students in the department to fulfill the same requirement.
- (2) The other publication must be published in journals that are indexed by SCI, SSCI, or EI, or in journals that are acknowledged by the Academic Committee.

The doctoral students are encouraged to publish and present papers at international conferences in a foreign language at least once. The above publications should be related to the research topic of the dissertation, and the affiliation of the student must be “Department of Civil Engineering, National Taiwan University” (or equivalent in other languages).

2. 博士班研究生於資格考試通過後，得於論文學位考試前三個月以論文初稿申請舉行論文指導會議，會議應公告並採公開方式進行，成員則以指導委員為主，必要時可邀請相關學者專家參與。

A student who has passed the qualifying examination may apply for the dissertation seminar with a draft of the dissertation three months prior to the degree examination. The seminar should be announced in advance and held openly, with the majority of participants being the members of the Advisory Committee. Relevant researchers or experts may also be invited to the dissertation seminar if necessary.

3. 論文學位考試應公告並採公開方式進行，考試委員之成員由指導教授推薦系內外教授或專家至少五人，經學術委員會同意後，由本系具函邀請，組成考試委員會。除特殊原因經系主任核准外，考試委員之成員應包括指導委員。

Degree examinations must be announced in advance and conducted openly. Members of the Examination Committee should include at least five internal or external professors or experts that are recommended by the dissertation supervisor and approval by the Academic Committee. The department will send the written invitations to the members of the Examination Committee to establish the committee. Except in special circumstances upon approval by the department chair, the Examination Committee should include the members of the Advisory Committee.

4. 博士班研究生申請論文指導會議、論文學位考試須經指導教授簽名同意。

The applications for dissertation seminars and degree examinations must be approved and signed by the dissertation supervisor.

5. 直攻博士班研究生之論文學位考試，如經考試委員會評定未達博士學位水準，但符合碩士學位水準者，得改頒給碩士學位。

A direct Ph.D. student will be granted a Master's degree instead if the Degree Examination Committee determines that the student is not qualified for a doctoral degree but is qualified for a Master's degree.

6. 博士班研究生各階段考試結果均應向系主任報備。

Results of all examinations that have been taken by the student must be reported to the department chair.

## 11. 各組學位考補充規定 Supplementary Division Regulations of Degree Examinations

組別 Division	學位考各組補充規定 Supplementary Regulations
大地組 Geotechnical Engineering	無特別規定 No other regulations.
結構組 Structural Engineering	無特別規定 No other regulations.
水利組 Hydraulic Engineering	博士候選人應以其論文研究內容，於論文口試前在水利工程專題討論課程中演講。 Ph.D. candidates should give a presentation about their dissertations in Seminars in Water Resources Engineering before the oral defense.
交通組 Transportation Engineering	無特別規定 No other regulations.
電輔組 Computer-Aided Engineering	<ol style="list-style-type: none"> <li>1. 應於申請正式論文口試前至少一個月前，提出論文初審，由本組教師三分之二以上認可，方得申請正式論文口試。 A student must apply for a preliminary oral defense of the dissertation no less than a month prior to application for the official one, and obtain approval from at least two-thirds of the professors in the division before the student is allowed to apply for the official oral defense.</li> <li>2. 應積極主動參與組務工作之推展，應於論文初審時，提出對本組之具體貢獻及服務說明，列入初審成績考核。 Students enrolled in the program are encouraged to actively participate in division affairs. During the preliminary oral defense, they are required to demonstrate any detailed contributions or efforts they have made to the division, which is part of the evaluation in the preliminary oral defense.</li> </ol>

	<p>3. 申請論文口試前之期刊論文發表應符合本所博士班研究生有關規定中第五條第二款之規定。另至少應有兩篇研討會論文被國內外學術性研討會接受刊登，至少出席參加一次國際性學術研討會，並親自以外文發表論文。</p> <p>Students should be in compliance with the regulations stated in Section 10.1 prior to applying for the oral defense. Students are required to publish at least two conference papers in national or international academic conferences and make presentation in a foreign language at an international conference at least once.</p>
<p>營管組 Construction Engineering and Management</p>	<p>1. 學生於論文口試前，必須以其論文內容為主題於系上舉行一場公開演講。</p> <p>Students must deliver a public speech in the department on their doctoral research before taking the oral defense.</p> <p>2. 申請論文口試前之期刊論文發表應符合本所博士班研究生學位考之關規定。</p> <p>The journal paper publication requirement for applying for the oral defense follows the regulations of the department as specified in Section 10.1.</p> <p>3. 申請本組論文口試前，額外學術發表規定如下：(1)至少須另有三篇其它研討會論文/摘要或期刊論文被學術性研討會或期刊接受刊登，(2)其中包括至少一篇於國際性研討會中報告並發表之論文。</p> <p>Additional publication and conference presentation requirements for applying for the oral defense in this division are as follows :</p> <p>(1) At least three additional conference papers/abstracts or journal papers are accepted for publication.</p> <p>(2) At least one of the above papers is presented at an international conference.</p>

<p>測量及空間資訊組 Surveying and Geospatial Engineering</p>	<p>博士班研究生於申請學位考試前，應符合本所博士班研究生有關規定中第 5 條第 2 款之要求。 註：依本所規定需至少一篇 SCI/SSCI 及一篇 SCI/SSCI/EI/學術委員會認定之期刊論文始能提出學位考試申請。本組認定期刊：測量工程、航測及遙測學刊。 Students should be in compliance with the regulations stated in Section 10.1 prior to applying for the degree examination. The acknowledged journals of the division include the Journal of Engineering Surveying and Journal of Photogrammetry and Remote Sensing.</p>
<p>人工智慧工程組 AI for Engineering Applications</p>	<p>無特別規定 No other regulations.</p>

## 12. 各組研究生抵免有關規定 Division Regulations on Credit Exemption

組別 Division	相關規定 Regulations
大地組 Geotechnical Engineering	<p>學生若於碩士班期間已經通過修課規定之相關課程則可以抵免課程，但不能抵免學分，亦即新修課程學分要求仍維持 18 學分</p> <p>Students who have passed the required courses during their Master's degree study may apply for course exemption, but the required number of credits remains as 18.</p>
結構組 Structural Engineering	<ol style="list-style-type: none"> <li>1. 學生欲提出抵免申請前，需先經過指導教授同意。 Students must have the approval of the dissertation supervisor to be eligible to apply for credit exemptions.</li> <li>2. 研究生於本校大學部已修畢本組認定之研究所開授課程，包含本校及三校聯盟或本組教師開授所有 M 字頭課程及 7 門 U 字頭課程「彈性力學一」、「基礎複合材料設計與實作」、「高等材料力學」、「訊號處理與頻譜分析」、「電腦模擬與計算材料力學」、「工程數學三」、「工程數學四」，等第成績達 A-者，經指導教授同意，可用以抵免學分數。抵免之總學分數以該學位應修最低畢業學分數四分之一為上限。於碩士班階段抵免之學分不得於博士班階段重複抵免。 For the credit exemption, the following requirements shall be met:             <ol style="list-style-type: none"> <li>a. The following courses have been taken in the students' undergraduate studies at National Taiwan University.                 <ol style="list-style-type: none"> <li>(1). Course numbers beginning with the letter M offered by National Taiwan University and National Taiwan University System and acknowledged by the structural division.</li> <li>(2). Course numbers beginning with the letter U and acknowledged by the structural division, including Theory of Elasticity (I), Fundamental Design and Manufacture of Fiber-Reinforced-Polymer (FRP)</li> </ol> </li> </ol> </li> </ol>

	<p>Composites, Advanced Mechanics of Materials, Signal Processing and Spectral Analysis, Computational Modeling for Mechanics of Materials, Engineering Mathematics (III), and Engineering Mathematics (IV).</p> <p>b. The course grade must be A- or above.</p> <p>c. The applications must be approved by the thesis advisor.</p> <p>d. The total credits to be exempted cannot be greater than 1/4 of the minimum credit requirement for the degree.</p> <p>e. The credits that have been exempted in the master's program cannot be reused and/or exempted in the doctoral program.</p>
<p>水利組 Hydraulic Engineering</p>	<p>本校生於大學部已修畢土木系研究所必修或土木系各組認定之課程，成績已達 70(B-)分者可抵免該課程，但不可抵免學分。</p> <p>The required courses and acknowledged courses can only be exempted when meeting all the following requirements:</p> <p>a. The courses have to be taken during the students' undergraduate studies at National Taiwan University.</p> <p>b. Students must obtain a grade 70(B-) or above in the courses.</p> <p>The credits of the exempted courses are not counted in the required credits toward graduation.</p>
<p>交通組 Transportation Engineering</p>	<p>1. 交通組博士班總抵免學分以 6 學分為上限。</p> <p>The total credits that can be exempted for the doctoral program cannot be higher than 6 credits.</p> <p>2. 本組研究生於本校已修畢本組研究所開授若干課程且及格，成績超過 85 (A 含) 分者，經組務會議同意，可用以抵免學分。研究所期間可不再重複修前述課程。</p> <p>The courses offered by the division that students have already taken at National Taiwan University and earned grade 85 (A) or above can be used for credit exemption upon approval by the Division Affairs Meeting. The courses that have already been exempted need not be retaken by students.</p>

	<p>3. 於碩士班階段抵免之學分不得於博士班階段重複抵免。 The credits that have been exempted during the Master's degree program cannot be reused and exempted in the doctoral program.</p>
<p>電輔組 Computer-Aided Engineering</p>	<p>1. 研究生曾於他校研究所修習及格之課程，該課程可否抵免需由組務會議審核，其餘皆不得抵免。 The credit exemption of courses that students have taken during their graduate studies at other universities is determined by the Division Affairs Meeting. No other courses that students have taken can be exempted.</p> <p>2. 本組研究生於本校大學部已修畢本組研究所必修或本組認定之研究所開授之課程，等第成績達 A 者，經指導教授同意，可用以抵免學分數。抵免之總學分數以該學位應修最低畢業學分數四分之一為上限。於碩士班階段抵免之學分不得於博士班階段重複抵免。 The required courses of the division or courses that are acknowledged by the division that students have already taken during their undergraduate studies at National Taiwan University with a grade A or above can be used for credit exemption upon approval by the dissertation supervisor. The total exempted credits cannot be higher than 1/4 of the minimum credit requirement for the degree. The credits that have been exempted during the Master's degree program cannot be reused and exempted in the doctoral program.</p>
<p>營管組 Construction Engineering and Management</p>	<p>1. 營建工程與管理組碩（博）士班總抵免學分以 6 學分為上限。 The total credits that can be exempted for the doctoral program cannot be higher than 6 credits.</p> <p>2. 本組研究生於本校已修畢本組研究所開授若干課程且及格，成績達 A 或 A+者，經指導教授簽名核可，可用以抵免學分。研究所期間可不再重複修前述課程。</p>

	<p>The courses offered by the division that students have already taken at National Taiwan University for which the grade A or A+ is achieved can be used for credit exemption upon approval by the dissertation supervisor. The course that has already been exempted need not be retaken by the student.</p> <p>3. 於碩士班階段抵免之學分不得於博士班階段重複抵免。</p> <p>The credits that have been exempted during the Master's degree program cannot be reused and exempted in the doctoral program.</p>
<p>測量及空間資訊組 Surveying and Geospatial Engineering</p>	<p>選修課程應由博士班研究生與其指導教授共同商議。對於曾修畢本組研究所之課程，且分數達八十五分(A)以上者，其學分之抵免與否應由其指導教授決定。</p> <p>Courses to take during their doctoral studies should be decided jointly by students and their dissertation supervisors. The credit exemption of courses required by the division that students have already taken for which the grade above 85 (A) is achieved is determined by the dissertation supervisor.</p>
<p>人工智慧領域 AI for Engineering Applications</p>	<p>選修課程應由博士班研究生與其指導教授共同商議。對於曾修畢本組研究所之課程，且分數達八十五分(A)以上者，其學分之抵免與否應由其指導教授決定。</p> <p>Courses to take during their doctoral studies should be decided jointly by students and their dissertation supervisors. The credit exemption of courses required by the division that students have already taken for which the grade above 85 (A) is achieved is determined by the dissertation supervisor.</p>