

成功大學生物醫學工程學系博士班修業辦法

Requirements for Ph.D. Program in Biomedical Engineering Department, National Cheng Kung University

83學年度醫學工程研究所第四次所務會議(84.01.04)通過
Approved at the 4th Faculty Meeting, 10/13/2003
92學年度醫學工程研究所第一學期第二次所務會議(92.10.13)修正通過
Approved at the 3rd Faculty Meeting, 10/13/2003
93學年度醫學工程研究所第二學期第三次所務會議(94.03.30)修正通過
Approved at the 3rd Faculty Meeting, 3/30/2005
94學年度醫學工程研究所第一學期第五次所務會議(95.01.25)修正通過, 95學年度實施
Approved at the 5th Faculty Meeting, 1/25/2006
95學年度醫學工程研究所第二學期第五次所務會議(96.04.20)修正通過, 96學年度實施
Approved at the 5th Faculty Meeting, 4/20/2007
96學年度醫學工程研究所第二學期第一次所務會議(97.02.29)修正通過
Approved at the 1st Faculty Meeting, 2/29/2008
98學年度醫學工程研究所第一學期第二次所務會議(98.10.23)修正通過
Approved at the 2nd Faculty Meeting, 10/23/2009
98學年度醫學工程研究所第二學期第一次所務會議(99.03.26)修正通過
Approved at the 1st Faculty Meeting, 3/26/2010
101學年度生物醫學工程學系第1學期第1次系務會議(101.08.21)修正通過
Approved at the 1st Faculty Meeting, 8/21/2012
104學年度生物醫學工程學系第1學期第3次系務會議(104.10.26)修正通過, 105學年度實施
Approved at the 3rd Faculty Meeting, 10/26/2015
104學年度生物醫學工程學系第1學期第5次系務會議(105.01.12)修正通過, 105學年度實施
Approved at the 5th Faculty Meeting, 1/12/2016
106學年度生物醫學工程學系第1學期第1次系務會議(106.09.14)修正通過
Approved at the 1st Faculty Meeting, 9/14/2017
107學年度生物醫學工程學系第1學期第3次系務會議(107.11.08)
Approved at the 3rd Faculty Meeting, 11/08/2018
107學年度生物醫學工程學系第1學期第4次系務會議(108.01.03)
Approved at the 4th Faculty Meeting, 1/03/2019
107學年度生物醫學工程學系第2學期第1次系務會議(108.03.07)
Approved at the 1st Faculty Meeting, 3/07/2019
108學年度生物醫學工程學系第2學期第6次系務會議(109.06.10)
Approved at the 6th Faculty Meeting, 6/10/2020
109學年度生物醫學工程學系第1學期第1次系務會議(109.08.06)
Approved at the 1st Faculty Meeting, 8/6/2020
109學年度生物醫學工程學系第2學期第2次系務會議(110.03.31)
Approved at the 2nd Faculty Meeting, 3/31/2021
110學年度第1學期第2次系務會議修正通過(110.09.07)
Amended and Approved at the 2nd Faculty Meeting, 09/07/2021
110學年度第2學期第1次系務會議修正通過(111.02.22)
Amended and Approved at the 1st Faculty Meeting, 02/22/2022
110學年度第2學期第3次系務會議修正通過(111.04.11)
Amended and Approved at the 3rd Faculty Meeting, 04/11/2022
110學年度第2學期第4次系務會議修正通過(111.05.24)
Amended and Approved at the 3rd Faculty Meeting, 04/11/2022

第一條 課程學分規定：

Article 1: Course Requirements

一、博士班研究生至少應修滿 **18 學分**(含專題討論)，論文、外國語文另計，不具醫學工程碩士學位者，應另補修醫學工程相關課程 **26 學分** (含經系務會議認可之抵免學分數。抵免申請應於入學第一學期第一個月向系務會議提出)。直攻博士者(含醫學士、學士、碩士直升者)應修滿 **36 學分** (含博士班 **18 學分**)。

1. Students of the Ph.D. program in Biomedical Engineering Institute are required to complete a minimum of 18 credits including 4 credits of seminars for graduation. Thesis credits are not included.

For non-Biomedical Engineering master's degree holders, additional 26 credits must be taken. Course credit waivers can be applied and discussed during the faculty meeting on the first month of your first semester in BME.

Students enrolled from 105 academic year, and students who applied for Direct Pursuit of Ph.D. degree (including doctor's, master's, and bachelor's) should complete 36 credits (including 18 credits for Ph.D. program).

二、第一款規定之外，博士班學生補修學分：

2. In addition, the required courses for Doctoral students are as follows:

(一) 甲乙組：選修本校醫學系或研究所生理學、解剖學或醫學院其他生命科學相關

的課程（需提請系務會議通過）6學分以上。選修其他生命科學相關課程學分超過3學分者，承認3學分。

- (1) Students in both groups A&B must enroll at least 6 credits in (1) Physiology, (2) Human Anatomy from NCKU medical school or other graduate schools in NCKU, or (3) other Biology related courses from NCKU medical school. Only 3 credits from biology related courses will be counted. The courses are subject to approval at the faculty meeting.
- (二) 丙 組：選修本校大學部工程數學、研究所醫用數學或生物統計6學分以上。
 - (2) Students in group C must take at least 6 credits in (1) college level Engineering Mathematics, (2) Engineering Mathematics in Medicine, or (3) Biostatistics at the graduate school level of NCKU.
- (三) 丁 組：選修本系醫療器材創新設計（一）、（二）。若未修過生理學或解剖學者，須修本校醫學系或研究所生理學或解剖學3學分。若未修過工程數學者，須修研究所的醫用數學或生物統計（醫療器材生醫統計與臨床實驗）3學分（註：大學部課程60分及格，但不計入畢業學分）。
- (3) Students in group D must take Biodesign 1 and 2 in BME. Those who don't have Physiology or Human Anatomy background are required to take 3 credits in Physiology or Human Anatomy from NCKU medical school or other graduate schools in NCKU.

For those who have no Engineering Mathematics background, 3 credits in Engineering Mathematics or Engineering Mathematics in Medicine (Statistics and Clinical Trials for Medical Device) from other graduate schools in NCKU must be taken. (Note: 60 is the passing score for college level courses, and college level credits will not be counted for graduation credits).

三、上述課程需經指導教授及系主任同意。

3. Before enrolling in any of the courses stated above, students must discuss and get approval from both their advisors and the department chair.

四、本系學、碩士直升博士者，至少應修習博士班專題討論二門（且含口頭報告2次）。

4. Students who are directly admitted into doctoral programs (from college level or master level) must take at least 2 "doctoral program seminar" courses, and must also include oral presentations in the two courses.

五、第二款所規定之解剖學，外籍生若因中文授課而無法修習時，得修習本校生醫相關科系英語授課3學分之細胞生物學相關科目抵免之。

5. For international students who are not able to take "Anatomy" taught in Chinese, which states in item 2. as required credits, can take any English taught 3 credits courses related to Cell Biology opened by NCKU Biomedical departments instead.

六、碩博士班研究生依規定應修習研究生通識課程，含學術倫理至少6小時、中英文寫作能力及溝通表達能力各1小時。本系研究生通識規劃於專題討論（二）及專題討論（三）課程中，若因故無法修習上述兩門課程時，應另行補足研究生通識時數，並於畢業審查時檢據證明之。

6. Doctoral students should practice in graduated general courses, including academic ethics

for at least 6 hours, Chinese and English writing skills, and communication skills. The graduated general courses are planned in the seminar (II) and seminar (III). If you are not able to practice the above two courses, the graduated general credits should be completed separately, and the inspection of check at the graduation review.

第二條 選定指導教授：

Article 2: Thesis Advisor

一、入學第一學年結束前必須選定，異動者，依「國立成功大學生物醫學工程學系研究生選擇及更換指導教授原則」提出申請。

1. Students should find their own thesis advisor before the end of the first semester of enrollment. In the event that a student wishes to change advisor, s/he must file an application following the “Guidelines for Selection and Changing of Graduate Thesis Advisor” and submit it to the department office.

二、主要指導教授須為本系專任教師。

2. The primary thesis advisor must be a full-time faculty of BME.

第三條 資格考試：

Article 3: Qualifying Examinations：

甲、乙組學生得自行選擇考試組別為甲/乙或丁組。

Students in Group A and B have to choice Group A, B or D for the test

一、筆試：

1. Written test：

(一) 分組考試科目規定：

(1) Subjects:

甲組：

(A) 生理學、解剖學或細胞生物學 (選一)

(B) 專業科目：生物力學、生醫材料、生物流體力學、動態分析、電腦輔助工程、奈米生物醫學 (選二)

(C) 跨組科目：1 門 (含丁組醫療器材創新設計、科技創業與投資管理、醫療器材法規與實務/智慧財產權管理)

Group A

1. Physiology, Anatomy or Cell Biology (Choose One)

2. Professional subjects: Biomechanics, Biomaterials, Biofluid Mechanics, Motion Analysis, Computer Aided Engineering (Choose Two)

3. Cross-group subjects: Choose one course from other group's professional subjects (Including Group D: Biodesign, High-Techentrepreneurship and Venture Capital, Medical Device Regulatory/ Intellectual Property Rights and Management)

乙組：

(A) 生理學、解剖學或細胞生物學 (選一)

(B) 專業科目：醫療儀器之設計與應用、醫療影像處理、生醫感測器、生醫訊號處理、數位醫療 (選二)

(C) 跨組科目：1 門 (含丁組醫療器材創新設計、科技創業與投資管理、醫療器材法規與實務/智慧財產權管理)

B Group

1. Physiology, Anatomy or Cell Biology (Choose One)

2. Professional subjects: Medical Instrument Design & Application, Medical Image Processing, Biosensor, Biomedical Signal Processing, Medical System Analysis, Digital Health. (Choose Two)

3. Cross-group subjects: Choose one course from other group's professional subjects (Including Group D: Biodesign, High-Tech Entrepreneurship and Venture Capital, Medical Device Regulatory/ Intellectual Property Rights and Management)

丙組：

- (A) 醫用數學或生物統計
- (B) 專業科目：依研究方向，選擇甲組或乙組之專業科目（選二）
- (C) 跨組科目：1 門（含丁組醫療器材創新設計、科技創業與投資管理、醫療器材法規與實務/智慧財產權管理）

C Group

1. Engineering Mathematics in Medicine or Biostatistics
2. Professional subjects: The graduate students should choose professional subjects listed in A or B group according to their chosen research field. (Choose Two)
3. Cross-group subjects: Choose one course from other group's professional subjects (Including Group D: Biodesign, High-Tech Entrepreneurship and Venture Capital, Medical Device Regulatory/ Intellectual Property Rights and Management)

丁組：

- (A) 醫療器材創新設計或科技創業與投資管理
- (B) 專業科目：醫療器材法規與實務 / 智慧財產權管理、甲組或乙組之專業目（選二）
- (C) 跨組科目：
 - (工程背景) 生理學或解剖學
 - (非工程背景) 醫用數學或生物統計(醫療器材生醫統計與臨床實驗)

D Group

1. Biodesign or High-Tech Entrepreneurship and Venture Capital.
2. Professional subjects: Medical Device Regulation / Intellectual Property Rights and Management (Choose Two)
3. Cross-group subjects:
 - (Engineering background) Physiology or Anatomy
 - (Non-Engineering background) Engineering Mathematics in Medicine or Biostatistics (Statistics and Clinical Trials for Medical Device)

- (二) 選考科目須經指導教授或系主任簽名同意後始可提出申請，選考科目必須於入學後4年內完成始得發放證書，未於期限內完成者視同未通過資格考，應予退學。
- (2) The exam application for elective subjects must be signed by the advisor or the department chair. **The qualifying examination must be finished in four years after entering the school. Those who failed to finished the qualifying examination in the deadline will be dropped out.**
- (三) 筆試時，所有考試科目同時考，及格之科目成績得保留，筆試有3次考試之機會，若未如期通過者，應予退學。
- (3) All subjects chosen should be taken together in one exam day. If any subject has reached the passing score, it is considered as passed. However, if a student fails a subject, s/he is allowed to retake the exam excluding the subject(s) s/he already passed. If a student fails to pass any of the subjects in three attempts, the department has the right to expel the student.

(四) 研究生若於時限內，跨組科目無法通過，經指導教授推薦，系主任認可後，得以選修相關學科及格，取代該跨組科目考試，但以選考前已經修過該科目學分者為限。

(4) If a student cannot pass the chosen cross-group subject in three attempts, the student is allowed to take a different cross-group subject as replacement, provided that s/he has already completed the subject credits before the examination. This course replacement application must be approved by the advisor and the department chair.

(五) 資格考試應於入學 4 年內完成。

(5) The qualifying exam must be completed within 4 academic years starting from the student's admission.

(六) 資格考得以發表論文方式抵免為之。學生仍需依規定申請資格考科，抵免科目屬性不限，一篇至多抵二科，以二科為限。該論文比照本辦法第四條畢業論文條件且須為IF排名前50% (含)，不得與畢業論文積分重覆計算，抵免科目與資格考成績一併提送系務會議審議。

(6) The qualifying exam can be waived by research papers publication. The students should still fill in the qualifying exam application to waive the subjects. The students can choose by themselves for the subjects they are going to waive. One published paper can waive 2 subjects at most, and only 2 subjects most can be waived by papers publication.

The IF ranking of paper published for qualify waive should be in the Journal ranking in the top 50% (inclusive), according to article 4 of this diploma regulations. However, this publication cannot be counted into the required 5 points research paper submissions or publications.

Both the subjects waived by paper publication and the grades of qualifying exam need to be approved by faculty meeting.

二、資格考試之筆試應於每學期之學期結束前提出申請，第二學期開學後第一個月舉行，相關日期每學期另行公告之。

2. If the student plans to take the written exam in a certain semester, s/he must complete the application in the previous semester. The exam will be held in the first month of the designated semester. The specific exam dates will be announced in the beginning of each semester.

三、通過資格考試者為博士學位候選人。

3. Students who passed the qualification exams are considered Doctoral Candidates.

四、學位口試至少 3 個月前，必須完成論文研究計畫書審查。

4. The review of the thesis research plan must be completed three months before the oral defense.

第四條 學位口試：

Article 4: Doctoral Degree Examinations

一、申請者須為博士學位候選人，且已修畢應修學分。

1. The applicant must be a Doctoral Candidate and have already obtained all required graduation credits.

二、博士論文以英文撰寫，內容須為修讀博士學位期間所完成之研究。申請學位口試前，應檢附下列資料，提送系務會議審核通過後，始得提出學位口試申請：

2. The doctoral thesis must be written in English. The content must elaborate the research completed while studying in the BME Ph.D. program. The candidate must file the following documents to the BME faculty meeting for review and approval before applying for oral defense:

(一) 本系博士班學生畢業前論文發表積分至少須滿 5 點，其中 3 點須是 SCI 論文，並以博士候選人為第一作者（若有共同第一作者（equal contributor），只認可排序第一位之作者），且文章的單位名稱排名應以本系名稱（Department of Biomedical Engineering, National Cheng Kung University）為第一位。論文記點之計算，以申請審查當時 JCR 的最新的期刊影響係數（impact factor, I.F.）及排名（category ranking）計算點數，如論文投稿（date of receiving）時之期刊論文點數高於最新期刊排名點數者，可從優採計。

(1) BME Ph.D. candidates must get at least 5 points from research paper submissions or publications before graduation. 3 of the 5 points must be from papers published in SCI journals. The Ph.D. candidate must be the primary author (if the authors are listed as equal contributors, only the first author is recognized). The Department of Biomedical Engineering, National Cheng Kung University must also be shown as the primary affiliation of the author.

The point system must follow these rules: (1) follow the latest JCR impact factor and category ranking at the time the candidate files the application for review; (2) If the impact factor of the journal was higher when the paper was received (judged by the date of receiving) than its latest impact factor, the higher impact factor is counted.

論文積分計算如下：

The paper points are calculated as follows:

1. IF 排名在該領域前 10%（含）或 $IF \geq 5.0$ 者為 5 點。
(1) The Journal whose IF ranking is in the top 10% (inclusive) or $IF \geq 5.0$ in the field will be 5 points.
2. IF 排名在該領域前 25%（含）或 $IF \geq 3.0$ 者為 4 點。
(2) The Journal whose IF ranking is in the top 25% (inclusive) or $IF \geq 3.0$ in the field will be 4 points.
3. IF 排名在該領域前 50%（含）或 $IF \geq 2.0$ 者為 3 點。
(3) The Journal whose IF ranking is in the top 50% (inclusive) or $IF \geq 2.0$ in the field will be 3 points.
4. IF 排名在該領域前 75%（含）或 $IF \geq 1.0$ 者為 2 點。
(4) The Journal whose IF ranking is in the top 75% (inclusive) or $IF \geq 1.0$ in the field will be 2 points.
5. 其他 SCI (含 SCIE) 為 1 點。（以 2 點為限）
(5) The Other SCI Journal (including SCIE) will be 1 point. (limited to 2 points)
6. 與論文研究相關之文稿，並已投稿於最近三年 SCI 引用期刊者為 1 點。與論文研究相關的醫療器材查驗登記文件（如 FDA 510k, PMA 或 CE）備齊並完成登記者或 TFDA Class II 以上獲證者為 1 點（以 1 點為限）。
(6) Papers which are directly related to their thesis and have already been submitted to a journal listed in SCI will get 1 point. Medical devices which are directly related to their thesis, of which the inspection and registration documents (such as FDA 501K, PMA or CE) have been completely prepared, and also have completed the registration process, will get 1 point. An FDA Class II registration will also get 1 point. (Points from medical devices registration documents will get a maximum of 1 point.)
7. 修業年限（不含休學）在 6 年（含）以上者，其第一作者的國際會議論文、EI 的英文期刊論文或獲得國內外發明專利（不含新型專利）者為 0.5 點（以 1 點）為限。

- (7) The Ph.D. candidates whose years of study is above 6 years (including the 6th year, but excluding the suspension years), can get 0.5 point from: (1) international conference papers of which s/he is the primary author, (2) papers written in English and posted in Journals listed in EI, (3) obtained an invention patent (exclude the utility model patent) at home and abroad. (Points from this article will get a maximum of 1 point.)
8. SSCI 期刊論文，比照 SCI 排名計分標準，乘上二倍。
- (8) Articles from SSCI Journals, will be 2 times the points of SCI journals
- (二) 以上資料檢附格式另訂之，如獲專利暫時無法發表者，須檢附專利文件及完成之文稿，交由系務會議審議之。
- (2) The format of the research papers will be made for reference. If any of the publication is one patent which cannot be published by the time of application, the candidate can file the completed documents of the patent to the faculty meeting for review.
- 三、口試委員：由指導教授推薦 5 至 9 位委員組成，校外委員須1/3 以上。召集人由校內委員（非指導教授）一人擔任，其餘委員選任相關規定依本校規定辦理。
3. Committee Members of Doctoral Oral defense: The doctoral examination committee members must be recommended by the advisor and shall consist of 5 to 9 members, including one-third or more non-NCKU faculty members. The convener should be an NCKU faculty (excluding the advisor) and the rest of the committee members shall be elected in accordance with the NCKU regulations.
- 四、學位考試方式：
- 依本校及本系規定辦理，且應於一週前公告之。
4. Doctoral Degree Examinations:
Must be conducted in accordance with the NCKU and BME regulations. The date must be announced one week before the examination.

第五條 其他相關規定：

Article 5: Other Regulations

- 一、博士班學生得視需要擔任助教工作。
1. Ph.D. students are required to serve as teaching assistants if needed.
- 二、研究生校外有專職者須向指導教授報備。
2. Ph.D. students who have a full time job outside the university, shall notify the advisors.
- 三、博士班學位候選人若需至設備較本系為佳之機關做實驗時，應提出書面申請，經指導教授及系主任同意後，得至該機關研究。
3. When a doctoral candidate needs to conduct an experiment in an off-campus lab or institution, a written application should be submitted to the department office. The application is subject to approval of the advisor and the department chair before the off-campus lab use.

第六條 如有未盡事宜依本系、本校及教育部相關規定辦理。

Article 6 For other matters, follow the relevant regulations of the department, the university and the Ministry of Education.