**國立交通大學資訊工程學系「電子工程跨域學程」實施要點**

**National Chiao Tung University**

**Department of Computer Science**

**Implementation Guidelines for Cross-Disciplinary Program in Electronics Engineering Department**

資訊工程學系104學年度第10次課程委員會修訂(105年04月07日)

資訊學院104學年度第3次教學與課程委員會修訂(105年05月05日)

104學年度第5次教務會議核備(105年06月08日)

資訊工程學系105學年度第8次課程委員會修訂(106年04月20日)

資訊學院105學年度第3次教學與課程委員會修訂(106年04月24日)

1. 依據國立交通大學跨域學程實施辦法，國立交通大學資訊工程學系(以下簡稱本系)為鼓勵學生進行跨領域學習，建立跨域學習深度，協助學生拓展第二專長，提供學生可以在畢業學分不增加(或僅少量增加)情況下，修畢跨域學程，特訂定本實施要點。

These Implementation Guidelines are prescribed by National Chiao Tung University Department of Computer Science (hereinafter referred to as Our Department) based on NCTU Cross-Disciplinary Program Implementation Regulations to provide the opportunity for students to proceed cross-disciplinary learning without increasing graduate credits (or only a few extra credits) in order to encourage students to conduct cross-disciplinary study, build the depth of cross-disciplinary study, and assist students to expand second specialty.

1. 依據國立交通大學跨域學程實施辦法，本系學生修習「電子工程跨域學程」(以下簡稱本學程)，於修畢後可於畢業證書上加註「電子工程」為跨域專長。

According to NCTU Implementation Guidelines for Cross-Disciplinary Program, students in CS department could be remarked as “Cross-Disciplinary Specialty” on the diploma once they complete this program.

1. 本辦法實施細節
2. 適用對象：本校104學年度（含）之後入學之學士班學生均適用本要點。
3. 申請程序：
4. 本系學生欲修習本學程者得於大一下學期或大二下學期向本系提出申請，經本系及電子工程學系課程委員會審查通過後，並得優先修習本學程課程。
5. 本學程的課程列示於『資訊工程學系「電子工程跨域學程」必修科目表』，其課程包含：校必修(含共同必修28學分)，本系基礎必修課程(以資電組58學分為準)，以及電子工程學系的跨域模組課程(30學分)，畢業學分至少128學分。
6. 修習本學程之學生，若無法完成 (2)中所規定之課程，可回復修習原資訊工程學系的學士學位課程。
7. **除必修科目表備註可以抵免之科目外，其餘抵免皆需遞送免修申請表。**
8. **經申請免修後之不足學分，得修習資工系或電子系之專業選修。**

Guidelines in detail

1. People applicable to this program: undergraduate students who are or after class of 2019
2. Procedure to apply for this program:
3. The application could be submitted to our department during the second semester of the first year or the second semester of the second year. The application should be sent to the Curricular Committee at our department and the EE department. Students could only take the cross-disciplinary program after evaluation by both sides.
4. Courses included in this program are listed on “The Required Course List for the students at our department study cross-disciplinary program in department of Electricals Engineering”. Courses are classified as:

 Required courses of the university: 28 credits

 Core curriculum at CS department: take CS + EE Program 58 credits as criterion

 Cross-disciplinary program module courses at EE department: 30 credits

 At least 128 credits are required for graduation

1. For students at our department who study for cross-disciplinary program but are not able to complete the program, they shall give up the cross-disciplinary program and transfer to study for the bachelor degree program at the original department of Computer Science.
2. 本系指定一名專任教師擔任跨域學程導師，與電子工程學系的跨域學程導師組成導師群，專責輔導跨域學程的學生。

Our department assigned one full-time teacher to be the mentor of the cross-disciplinary program and formed mentor group with teachers of cross-disciplinary program at other department or college to give guidance to cross-disciplinary program students.

1. 本要點如遇修訂，須主動知會電子工程學系。

CS department should notify EE department if the guidelines need to be revised.

1. 本要點如有未盡事宜，悉依本校學則及其他相關規定辦理。

If there is any unaccomplished matter of these guidelines, it shall be handled in accordance with the school constitution of our university as well as other relevant regulations.

1. 本要點經校級課程委員會通過並提教務會議核備後實施，修訂時亦同。

These guidelines were approved by Curricular Committee at university level and then submitted to the Council of Academic Affairs for approval-for-reference before putting it into practice; the same shall be done upon any amendment thereto.

**資訊工程學系「電子工程跨域學程」 必修科目表**

**Courses for CS Department**

**Cross-disciplinary Program in EE Department**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 類別Category | 選別Classification | 科目名稱Courses | 學分Credits | 開課系所Dept. | 備註Remarks |
| 上學期Fall Semester | 下學期Spring Semester |
| 本系基礎必修（58學分）Core curriculum at our department（58 credits） |  | 物理（一）（二）Physics (I)(II) | 3 | 3 | 本校NCTU | 三選一Pick 1 out of 3 |
| 普通生物（一）（二）General Biology (I)(II) |
| 化學（一）（二）Chemistry (I)(II) |
| 微積分（一）（二）Calculus(I)(II) | 4 | 4 |  |
| 線性代數Linear Algebra | 3 |  | 資工系CS |  |
| 計算機概論與程式設計Intro. to Computers and Programming | 3 |  |  |
| 資料結構與物件導向程式設計Data Structures and Object-oriented Programming |  | 3 |  |
| 離散數學Discrete Mathematics |  | 3 |  |
| 數位電路設計Digital Circuit Design |  | 3 |  |
| 數位電路實驗Digital Circuit Lab. | 2 |  |  |
| 演算法概論Intro. to Algorithms | 3 |  |  |
| 作業系統概論Intro. to Operating Systems | 3 |  |  |
| 計算機組織Computer Organization |  | 3 |  |
| 資訊工程專題（一）（二）Computer Science and Engineering Projects(I)(II) | 2 | 2 | **可以「跨領域專題(一)(二)」申請免修** |
| 微處理機系統實驗Microprocessor System Lab. | 2 |  |  |
| 電路與電子學（ㄧ）Electrical Circuits and Electronics I | 3 |  |  |
| 編譯器設計概論Intro. to Compiler Design | 3 |  |  |
| 訊號與系統Signals and Systems |  | 3 |  |
| 軟硬體協同設計概論與實作Hardware-Software Co-design and Implementation |  | 3 |  |
| 導師時間Mentor's Hours | 0 | 0 |  |
| 服務學習（一）Service Learning I |  | 0 |  |
| 服務學習（二）Service Learning II | 0 |  |  |
| 資訊工程研討Computer Science Seminars | 0 |  |  |
| 基礎程式設計Basic Programming |  | 0 | 本課程及格條件為通過『程式能力鑑定』Pass=Passing Basic Computer Programming Exam |
| 電子系跨域模組（30學分）修畢於畢業證書加註『跨域專長：電子工程』Cross-disciplinary modules at other department(30 credits)Could be remarked as “Cross-Disciplinary Specialty” on the diploma | 必修Compulsory Courses | 邏輯設計Logic Design | 3 |  | 電子系EE | 可以抵免之資工系課程「數位電路設計」Can be waived by “Digital Circuit Design” offered by CS Dept. |
| 跨領域專題（一）（二）Cross-disciplinary Project (I)(II) | 2 | 2 | 電子系/資工系EE /CS | **需資訊工程學系和電子工程學系教授共同指導** |
| 電子學（一）Electronics(I) | 3 |  | 電子系EE |  |
| 電子學（二）Electronics(II) |  | 3 | 電子系EE |  |
| 電子實驗（一）Electronics Lab.(I) | 2 |  | 電子系EE |  |
| 機率、微分方程、複變函數（三選一）Probability, Differential Equations, Complex Variable (Pick 1 out of 3) | 3 | 電子系EE | 可以抵免之資工系課程「機率、微分方程」Can be waived by “Probability”, “Differential Equations” offered by CS Dept. |
| 選修Elective Courses | 電磁學Electromagnetics | 3 | 電子系EE | **任選4科**（資工系類似課程可以申請抵免）**Pick at least 4 courses** (similar ones in CS department can be used to waive courses listed here) |
| 控制系統導論Introduction to Control Systems | 3 | 電子系EE |
| 數位訊號處理Digital Signal Processing | 3 | 電子系EE |
| 超大型積體電路設計導論Introduction to VLSI Design | 3 | 電子系EE |
| 類比積體電路導論Analog Integrated Circuits | 3 | 電子系EE |
| 電力電子導論Fundamental of Power Electronics | 3 | 電子系EE |
| 數位電路與系統Digital Circuits and Systems | 3 | 電子系EE |
| 通訊原理Principles of Communication Systems | 3 | 電子系EE |
| 半導體元件物理Semiconductor Device Physics | 3 | 電子系EE |
| 材料科學導論Introduction to Materials Science | 3 | 電子系EE |
| 電子設計自動化概論Introduction to Electronic Design Automation | 3 | 電子系EE |
| 固態物理（一）Solid State Physics (I) | 3 | 電子系EE |
| 校必修Common Required Courses | 28 | 校必修：含共同必修28學分（含外語課程必修8學分），至多採計40學分[註1]Required courses of the university (including 28 credits of general education subjects, 8 credits of foreign language course inclusive with the maximum 40 credits countable) |
| 最低畢業學分Minimum Credits Required for Graduation | 128 |  |

註1：本校共同必修科目表規定，外語課程必修至少6學分。如大學部學生修習共同必修學分數超過28學分以上，本校至多可採至40學分於最低畢業學分內，但各學系另有規定者，從其規定。