

**Course List for International Doctor of Philosophy (Ph.D.) Degree Program in Communication and Systems Engineering (Offered by Department of Electrical Engineering), Chang Gung University**

**( For 2016 Calendar Year Admission), April 21th 2016 )**

| Fields                                    | RE | Course Title                                           | Credits | Year of Class | 1st Semester | 2nd Semester | Fields                                    | RE | Course Title                                               | Credits | Year of Class | 1st Semester | 2nd Semester | R: Required; E: Elective |               |
|-------------------------------------------|----|--------------------------------------------------------|---------|---------------|--------------|--------------|-------------------------------------------|----|------------------------------------------------------------|---------|---------------|--------------|--------------|--------------------------|---------------|
|                                           |    |                                                        |         |               |              |              |                                           |    |                                                            |         |               |              |              | Credits                  | Year of Class |
| General Requirement                       | R  | Seminar(1)                                             | 1       | 1st           | 1            |              |                                           | E  | Medical Physics                                            | 3       | 1st           | 3            |              |                          |               |
|                                           | R  | Seminar(2)                                             | 1       | 1st           | 1            |              |                                           | E  | Design and Application of Mixed-Signal Integrated Circuits | 3       | 1st           | 3            |              |                          |               |
|                                           | R  | Seminar(3)                                             | 1       | 2nd           | 1            |              |                                           | E  | Nano Circuit Design                                        | 3       | 1st           | 3            |              |                          |               |
|                                           | R  | Seminar(4)                                             | 1       | 2nd           | 1            |              |                                           | E  | VLSI Computer-Aided Circuit Design                         | 3       | 2nd           | 3            |              |                          |               |
|                                           | R  | Ph.D. thesis                                           | 6       |               |              |              | Biomedical Engineering and Circuit System | E  | VLSI Digital Signal Processing Design                      | 3       | 2nd           | 3            |              |                          |               |
|                                           | R  | English Technical Writing (1) (2)                      | 2       | 1st           | 1            | 1            |                                           | E  | Biomedical Imaging System                                  | 3       | 2nd           | 3            |              |                          |               |
|                                           | E  | Scientific Writing                                     | 3       | 1st           | 3            | 3            |                                           | E  | Embedded Systems Programming                               | 3       | 2nd           | 3            |              |                          |               |
|                                           | E  | Advanced English Writing                               | 0       | 4th           | 0            | 0            |                                           | E  | Biophotonic Engineering and Experiments                    | 3       | 2nd           | 3            |              |                          |               |
|                                           |    |                                                        |         |               |              |              |                                           | E  | Bionedical Information Processing                          | 3       | 2nd           | 3            |              |                          |               |
|                                           | E  | Random Processes                                       | 3       | 1st           | 3            |              |                                           | E  | Medical Instrumentation                                    | 3       | 1st           | 3            |              |                          |               |
| Communications                            | E  | Number Theory                                          | 3       | 1st           | 3            |              |                                           | E  | Fuzzy Control                                              | 3       | 1st           | 3            |              |                          |               |
|                                           | E  | Optoelectronics                                        | 3       | 1st           | 3            |              |                                           | E  | Artificial Neural Network                                  | 3       | 1st           | 3            |              |                          |               |
|                                           | E  | Communication Theory                                   | 3       | 1st           | 3            |              |                                           | E  | Power System Stability and Control                         | 3       | 1st           | 3            |              |                          |               |
|                                           | E  | Detection and Evaluation Theory                        | 3       | 1st           | 3            |              |                                           | E  | Solid State Energy Conversion                              | 3       | 1st           | 3            |              |                          |               |
|                                           | E  | Queueing Theory                                        | 3       | 1st           | 3            |              |                                           | E  | Nonlinear Control                                          | 3       | 1st           | 3            |              |                          |               |
|                                           | E  | Advanced Digital Signal Processing                     | 3       | 1st           | 3            |              |                                           | E  | Power Quality                                              | 3       | 2nd           | 3            |              |                          |               |
|                                           | E  | Principle and Application of Computer Vision           | 3       | 1st           | 3            |              |                                           | E  | Renewable Energy Technologies                              | 3       | 2nd           | 3            |              |                          |               |
|                                           | E  | Advanced Error Control Coding and Applications         | 3       | 1st           | 3            |              |                                           | E  | Robust Control                                             | 3       | 2nd           | 3            |              |                          |               |
|                                           | E  | Cryptography                                           | 3       | 2nd           | 3            |              |                                           | E  | Advanced Topics of Electric Machines and Drives            | 3       | 2nd           | 3            |              |                          |               |
|                                           | E  | Wireless Network                                       | 3       | 2nd           | 3            |              |                                           | E  | Electrical Machine Control                                 | 3       | 2nd           | 3            |              |                          |               |
| Biomedical Engineering and Circuit System | E  | Network Security                                       | 3       | 2nd           | 3            |              | Power and Control                         | E  | Electromagnetic Transients Analysis                        | 3       | 2nd           | 3            |              |                          |               |
|                                           | E  | Spread Spectrum Communication                          | 3       | 2nd           | 3            |              |                                           | E  | Adaptive Control                                           | 3       | 2nd           | 3            |              |                          |               |
|                                           | E  | Adaptive Filter Principle                              | 3       | 2nd           | 3            |              |                                           |    |                                                            |         |               |              |              |                          |               |
|                                           |    |                                                        |         |               |              |              |                                           |    |                                                            |         |               |              |              |                          |               |
|                                           | E  | Biomedical Electronics                                 | 3       | 1st           | 3            |              |                                           |    |                                                            |         |               |              |              |                          |               |
|                                           | E  | Medical Imaging                                        | 3       | 2nd           | 3            |              |                                           |    |                                                            |         |               |              |              |                          |               |
|                                           | E  | SOC Systems Design Overview                            | 3       | 1st           | 3            |              |                                           |    |                                                            |         |               |              |              |                          |               |
|                                           | E  | Digital Silicon Intellectual Property Design           | 3       | 1st           | 3            |              |                                           |    |                                                            |         |               |              |              |                          |               |
|                                           | E  | Biomedical Application of Chip Design and Experimental | 3       | 1st           | 3            |              |                                           |    |                                                            |         |               |              |              |                          |               |
|                                           | E  | Pattern Recognition                                    | 3       | 1st           | 3            |              |                                           |    |                                                            |         |               |              |              |                          |               |
| Comments                                  | E  | Advanced Computer Architecture                         | 3       | 1st           | 3            |              |                                           |    |                                                            |         |               |              |              |                          |               |
|                                           | E  | Biomedical Signal Analysis                             | 3       | 1st           | 3            |              |                                           |    |                                                            |         |               |              |              |                          |               |

1. Graduation credits: 30 (12 credits for the General Requirement courses including 6 credits of Ph.D. thesis, and at least 18 credits from the elective courses in Communication and Systems Engineering as well as Computer Science and Information Engineering).

2. The certification of English proficiency is mandatory based on the requirement of "The implementation plan of English capability testing for Ph. D. students of Engineering School at Chang Gung University"

3. "Thesis Writing" courses are required for the 2nd and above years and the 6 credits of "Ph.D. Thesis" will be granted after the pass of Ph.D. dissertation defense.

4. Seminar (1)(2)(3)(4) are required for the 1st and 2nd years (1 credit for each course). Total 8 semesters of Seminar courses have to pass before graduation. This requirement is not applicable to the Ph.D. students who graduate within 4 academic years and pass all the Seminar courses every semester before graduation. The time in school of the 5th and above year Ph.D. students will be managed by their academic advisors and basically should attend the lab weekly meeting to maintain the interaction in academic study.

Chair of Department:

Curriculum Committee:

張偉能

林 俊 4/21

2016/04/21