

**Course Title** Advanced Electrical Engineering Design II (2<sup>nd</sup> Part of 3 parts)

**Course Number** LE302 (Communication Laboratory)

**Credit Hours** 2 (3 weeks)

**Prerequisites** LE301

**Expected previous knowledge** Fundamentals of communication systems, digital communications, and electromagnetics.

**Instructor** Dr. Pongsak Mahachoklertwattana, Assoc.Dr.Jarree Chaicharn

**Course Objectives** To help students obtain deeper knowledge regarding communications and communication systems via various experiment test sets, and learn how to use some measuring equipment in communication systems.

**Tentative Course Schedule** There will be 6 following laboratories regarding communications:

- |  |                            |
|--|----------------------------|
| 1) Spectrum Analyzer & Sampling Theory | 2) Amplitude Modulation    |
| 3) Optical Communication               | 4) Transmission Lines      |
| 5) Digital Communication               | 6) Vector Network Analyzer |

Students are required to do all laboratories (2 laboratories per week), write reports and submit them one week after. Refer to the group assignment and schedule in next page. Also follow the lab report guideline in page 3 when writing reports.

### **Textbook and Reference**

[1] Lab instructions

### **Grading**

|            |      |
|------------|------|
| Attendance | 20%  |
| Lab Report | 80%  |
| Total      | 100% |

## Grouping & Schedule

### 1 Group Assignment

| เลขที่ | เลขทะเบียน | ชื่อ                       | Group |
|--------|------------|----------------------------|-------|
| 1      | 5810751601 | นายชนน สักวาลย์เงิน        | 1     |
| 2      | 5810751643 | นายณัฐวุฒิ เหลืองสมบูรณ์   |       |
| 3      | 5810755537 | นายพัทธวุธ มานะพงศ์พันธ์   |       |
| 4      | 5910750263 | นายธีรวัช นาคเสนีย์        | 2     |
| 5      | 5910750685 | นางสาวสุชานันท์ พิชัยยุทธ์ |       |
| 6      | 5910751485 | นายวรภาพงษ์ ณรงค์ฤทธิ      |       |
| 7      | 5910752210 | นางสาวณัฐนรี แซ่ลิม        | 3     |
| 8      | 5910753069 | นางสาวรวีสร่า กาญจนสวัสดิ์ |       |
| 9      | 5910753085 | นายจิระวิน เขียวหนุ่น      |       |
| 10     | 5910755437 | นายธีรวัชร อัครผลพานิช     | 4     |
| 11     | 5910755536 | นายกันตพงศ์ วงศ์หิรัญรัตน์ |       |
| 12     | 5910755619 | นายธนภัทร ลาภอุดมพันธ์     |       |
| 13     | 5910755627 | นายเตชินท์ โชติพงศ์วัฒนา   | 5     |
| 14     | 5910755726 | นายกันต์ ดิสสร             |       |
| 15     | 5910756021 | นางสาวอภัสรา กริชกำจร      | 6     |
| 16     | 5910756062 | นายชยธร ไนยทอง             |       |

### 2 Schedule

Students are required to finish **two** laboratories per week; the schedule is listed below.

| Group | Week 1               |                      | Week 2               |                      | Week 3               |                      |
|-------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|       | 1 <sup>st</sup> half | 2 <sup>nd</sup> half | 1 <sup>st</sup> half | 2 <sup>nd</sup> half | 1 <sup>st</sup> half | 2 <sup>nd</sup> half |
| 1     | 1                    | 2                    | 3                    | 4                    | 5                    | 6                    |
| 2     | 2                    | 1                    | 4                    | 3                    | 6                    | 5                    |
| 3     | 3                    | 4                    | 5                    | 6                    | 1                    | 2                    |
| 4     | 4                    | 3                    | 6                    | 5                    | 2                    | 1                    |
| 5     | 5                    | 6                    | 1                    | 2                    | 3                    | 4                    |
| 6     | 6                    | 5                    | 2                    | 1                    | 4                    | 3                    |

## Lab Report Guideline

Writing lab reports is considered a good practice to write a thesis or a paper, thus it would be one important objective of this course as well.

**Format** A report must consist of the following:

**1. Title** Just write the title of the laboratory.

**2. Introduction** The introduction defines the subject of the report. It must outline the objective(s) for the experiments performed and give the reader sufficient background to understand the rest of the report. A good introduction will answer several questions, including the following:

*Why was this study performed?*

*What is the theoretical background of this subject?*

*What is the specific purpose of the study?*

### **Materials and Methods**

As the name implies, the materials and methods used in the experiments should be reported in this section. Write *actual* experiment procedures (the things you actually did during laboratory) succinctly using your own words; don't just copy them from lab instruction sheets. Generally, this section attempts to answer the following questions:

*What materials (or equipment) were used?*

*How were they used or what experiments were performed?*

### **Results**

The results section should summarize the data from the experiments without discussing their implications. The data should be organized into tables, figures, graphs, photographs, and so on. But data included in a table should not be duplicated in a figure or graph.

All figures and tables should have descriptive titles and should include a legend explaining any symbols, abbreviations, or special methods used. Figures and tables should be numbered separately and should be referred to in the text by number, for example:

1. Figure 1 shows that the E-plane radiation pattern of the dipole.
2. There are two prominent peaks opposite to each other (fig. 1).

Figures and tables should be self-explanatory; that is, the reader should be able to understand them without referring to the text. All columns and rows in tables and axes in figures should be labeled. See appendix B for graphing instructions.

This section of your report should concentrate on general trends and differences and not on trivial details. Many authors organize and write the results section before the rest of the report.

### **Discussion**

This section should not just be a restatement of the results but should emphasize interpretation of the data, relating them to existing theory and knowledge. Speculation is appropriate, if it is so identified. Suggestions for the improvement of techniques or experimental design may also be included here. In writing this section, you should explain the logic that allows you to confirm the theoretical backgrounds or speculate the causes which may lead to some contradictory results.