Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2023-2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: This description of the academic program provides a brief summary of the main characteristics of the program and the expected learning outcomes of the students to demonstrate whether they have made the best use of the opportunities available. It is accompanied by a description of each course within the program.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: University of Technology
Faculty/Institute: Electrical Engineering Department
Scientific Department: Electrical Engineering Branch
Academic or Professional Program Name: Electrical Engineering Bachelor
Final Certificate Name: B.Sc.
Academic System: Semester system
Description Preparation Date: 26 /3/2024
File Completion Date: 26 /3/2024

Signature:
Head of Department Name:
Assist. Prof Dr. Mohammed Kdair Abd
Date: 1 /4/2024

Signature:
Scientific Associate Name:
Prof Dr. Mohammed Yousif Hassan
Date: 1 /4/2024

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Lecturer Sarab Ali Mahmood
Date: 28 /3/2024
Signature:

Approval of the Dean
Assist. Prof Dr. Jabbar Khalaf Mohammed
18-4-2024

1. Program Vision

The Electrical Engineering Branch seeks to prepare and graduate engineers specialized in electrical engineering that are able to apply engineering sciences in scientific life and make decisions to solve problems in a way that ensures community service and continued sustainable development.

2. Program Mission

Working to prepare and graduate leading scientific and leadership competencies in the field of engineering sciences, equipped with the foundations of knowledge and skills in accordance with international quality assurance standards and in a manner consistent with community service, responding to local market requirements, and consolidating the principles of sustainable development.

3. Program Objectives

(a) Preparing graduates in the field of understanding and design of electric circuits and the use of computer skills and software development.

(b) The ability to understand the problems to be solved and to find the target required representative of solving these problems through the collection of data for electric circuits and scientific programs and analysis.

(c) Provide the educational process within the department of teachers and researchers and provide public institutions with qualified engineers in the field of competence.

4. Program Accreditation

The department is preparing to obtain accreditation from the organization **ABET**.

5. Other external influences
Field visits, practical part, scientific consultations

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
College Requirements	128	298	42%	Basic +Optional (4)
Department Requirements	63	145	43%	Basic + Optional (2)
Summer Training	Yes			Basic
Other	8	2	25	Workshops

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours			
			Theoretical	Lab	Pra.	Tutorial
2023-2024 First Year First Semester Bologna system	DEHR105	Democracy and Human Rights	2			
	WSHE106	Workshops			6	
	COSC108	Computer	1	2		
	EDAC111	Engineering Drawing and AutoCAD		2	2	
	FUEE112	Fundamentals of Electrical Engineering 1	3	2		1
	MATH113	Mathematics 1	3			1
	MEEN114	Mechanical Engineering	3			
2023-2024 First Year	WSHE106	Workshops			6	
	ENLA107	English Language	2			
	DITE121	Digital Techniques	3	2		

Second Semester Bologna system	FUEE122	Fundamentals of Electrical Engineering 2	3	2		1
	MATH123	Mathematics 2	3			1
	PHEL124	Physics of Electronics	4			
Year/Level	Course Code	Course Name	Credit Hours			
			Theoretical	Pra.	Tutorial	
2023-2024 Second Year First Semester	EEU211	Crimes of the Ba'ath regime in Iraq	2			
	EEB212	Engineering Mathematics 1	3			
	EEB213	Probability Theory and Engineering Statistics	2			
	EEB214	Electromagnetic Fields 1	2		1	
	EEE215	Analog Electronics 1	2		1	
	EEE216	Electrical Circuits 1	2		1	
	EEE217	DC Machines	2		1	
	EEC218	Computer Programming	1	2		
	EEP219	Analog Electronics Lab. 1 and DC Machines Lab.		4		
2023-2024 Second Year Second Semester	EEU221	Technical English 2	2			
	EEU222	Human Rights and Democracy	2			
	EEB223	Engineering Mathematics 2	3			
	EEB224	Electromagnetic Fields 2	2		1	
	EEE225	Analog Electronics 2	2		1	
	EEE226	Electrical Circuits 2	2		1	
	EEE227	AC Machine 1	2		1	
	EEC228	Instrumentation and Measurements	2			
	EEP229	Analog Electronics Lab. 2 and AC Machines Lab. 1		4		

Year/Level	Course Code	Course Name	Credit Hours		
			Theoretical	Pra.	Tutorial
2023-2024 Third Year First Semester	EE31 01	Electrical Power Engineering	2		
	EE31 02	AC Machines 2	2		1
	EE31 03	Microprocessor Engineering 1	2		
	EE31 04	Engineering Analysis 1	4		1
	EE31 05	Control Engineering 1	2		1
	EE31 06	Communication Engineering 1	2		
	EE31 07	Human Rights & Engineering Skills and Ethics	2		
	EE31 08	Electrical Engineering Lab. 3		4	
	EE31 09	Control Lab.		4	
2023-2024 Third Year Second Semester	EE32 10	High Voltage Engineering	2		
	EE32 11	AC Machines 3	2		1
	EE32 12	Microprocessor Engineering 2	2		
	EE32 13	Engineering Analysis 2	4		1
	EE32 14	Control Engineering 2	2		1
	EE32 15	Communication Engineering 2	2		
	EE32 16	Electronics 3	2		
	EE32 17	Electrical Engineering Lab. 4		4	
	EE32 18	Communication Lab.		4	

Year/Level	Course Code	Course Name	Credit Hours		
			Theoretical	Pra.	Tutorial
2023-2024	EE41 01	Final Year Project 1	1	2	

Fourth Year First Semester	**EE41 02**	**Power System Analysis 1**	**3**		
	EE41 03	**Elective Subject 1**	**2**		**1**
	EE41 04	**AC Machines 4**	**2**		**1**
	EE41 05	**Power Electronics 1**	**2**		**1**
	EE41 06	**Electronics 4**	**2**		**1**
	EE41 07	**Industrial Management**	**2**		
	EE41 08	**Electrical Engineering Lab. 5**		**4**	
2023-2024 Fourth Year Second Semester	**EE42 09**	**Final Year Project 2**	**2**		
	EE42 10	**Power System Analysis 2**	**2**		**1**
	EE42 11	**Elective Subject 2**	**2**		
	EE42 12	**Electrical Machines Drives**	**4**		**1**
	EE4213	**Power Electronics 2**	**2**		**1**
	EE42 14	**Communication Engineering 3**	**2**		
	EE42 15	**Operations Research**	**2**		
	EE42 16	**Electrical Engineering Lab. 6**		**4**	

8. **Expected learning outcomes of the program**	
Knowledge	
1-Fundamentals of Electronic Engineering	Mastery of basic concepts, theories, and principles in electrical engineering.
2-Engineering Applications	Understanding of the applications of electrical engineering in various industries and fields, such as power stations, transformers and control systems.
3-Latest Technologies	Knowledge of the latest technologies and innovations in the field of electrical engineering and how to apply them in solving practical problems.
Skills	

Analysis and Design	1. Ability to accurately analyze engineering problems and design innovative solutions using electrical engineering principles.
Practical and Experimental Skills	2. Proficiency in using electrical equipment, conducting experiments, and interpreting data to develop a deep understanding of theoretical concepts.
Technical Skills	3. Mastery of using specialized engineering software, programming and designing electrical circuits.
Ethics	
Professional Ethics	1. A strong commitment to ethical and professional standards, emphasizing the importance of integrity, responsibility, and respect for intellectual property rights.
Teamwork	2. Ability to work within multidisciplinary teams, with an appreciation for diversity and inclusivity in the workplace.
Continuous Improvement	3. Belief in the importance of lifelong learning and self-improvement as a foundation for professional and personal success in the field of electrical engineering.

9. **Teaching and Learning Strategies**
1. Presenting exercises during lectures and assigning them to students for completion at home, along with laboratory applications relevant to their field of study.

2. Monitoring students' learning methods and assessing their knowledge growth throughout the academic year, understanding their needs, weaknesses, and strengths, and possessing the ability to evaluate their progress realistically.
3. Utilizing modern electronic tools for illustration.
4. Adopting contemporary textbooks.

10. Evaluation methods

1. Exam sudden and evaluation of homework in addition to the written exam quarterly
2. A quarterly exam
3. Exam quarterly "small projects
4. Preparing quarterly reports
5. Class discussions and discussions
6. Determine the grade for daily attendance

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Professor	Electrical Engineering	Power Engineering and Electrical Machines		1	

Professor	Electrical Engineering	Control and Direction Engineering		1	
Assistant Professor	Electrical Engineering	Electrical Power Engineering		8	
Assistant Professor	Electrical Engineering	Renewable Energy Engineering and Power Distribution Systems		1	
Assistant Professor	History	History of Modern Literature		1	
Lecturer	Electrical Engineering	Electrical Power Engineering		15	
Lecturer	Systems Engineering	Electrical Power Electronics Engineering		1	
Assistant Lecturer	Electrical Engineering	Electrical Power Engineering		6	
Assistant Lecturer	Electrical Engineering	Control and Computers		1	
Assistant Lecturer	Electrical Engineering	Electronics and Communications		1	
Assistant Lecturer	Science	Mathematics and Computer Applications		1	
Assistant Lecturer	Statistic	Time series		1	

Professional Development

Mentoring new faculty members

1. In the Electrical Engineering department, new members are developed through workshops, discussion circles, and training courses on topics such as teaching methods, educational qualifications, digital teaching strategies, and specialized courses in scientific research, among others. This also includes training for newly appointed staff under the supervision of competent, experienced professors from the department, and assessing their teaching eligibility to ensure it meets the requirements for obtaining an academic title.
2. Publication of a scientific paper in Scopus-indexed journals is mandatory.

Professional development of faculty members

1. Participating in courses aimed at developing teaching skills through continuing education programs.
2. Organizing specialized seminars and workshops.
3. Encouraging faculty members to participate in national and international conferences.

12. Acceptance Criterion

1. The central admission criteria are determined by the Ministry of Higher Education and Scientific Research for graduates of secondary schools (applied, biological).
2. The top ten outstanding students from graduates of vocational educational institutes within the specified specialties are accepted

13. The most important sources of information about the program

- Power Electronics: Circuits, Devices and Applications (3rd Edition) by M. H. Rashid, 2003.

- Power Electronics: Converters, Applications, and Design by Ned Mohan, 2002.
- Power Electronics, A First Course: Simulations and Laboratory Implementations by Ned Mohan, 2023.
- Electric Motors and Drives: Fundamentals, Types and Applications by Austin Hughes, 2006.
- Power Electronics by Daniel Hart, January 2010 ,McGraw Hill.
- Power Electronics by Cyril W Lander ,1987 ,McGraw Hill
- Ogata, K. (2010).Modern Control Engineering, Prentice Hall.
- Nise, N. S. (2011). Control Systems Engineering, John Wiley.
- Dorf, R. C. and R. H. Bishop (2011). Modern Control Systems, Prentice Hall.
- M.G. Say and E.O. Taylor, Direct Current Machines, Pitman Pub.
- H.C. Gerhard Henneberger, Electrical Machines.
- B.L.Theraja , A Textbook of Electrical Technology in S.I. units, S. Chand
- John Hindmarsh, Electrical Machines and their applications. □
- S.K. Pillia, First Course on Electrical drivers
- S.Dewan, G. Slemon & A. Straughen, Power Semiconductor Drives, John Wiley Pub.
- A. Fitzgerald, C. Kingsley & A. Kusko, Electric Machinery, McGraw-Hill Pub.
- Glover, J. D., Overbye, T. and Sarma, M.S., Power System Analysis and Design, 6th Ed., Cengage Learning, 2016.
- Weedy, B., Cory, B. and Jenkins, N., Electric Power Systems, 5th Ed., Wiley, 2012.
- Grainger, J. and Stevenson, W., Power System Analysis, McGraw Hill, 1994.
- Stevenson, W., Elements of Power System, 4th Ed., McGraw Hill, 1982.
- Elgerd, O. I., Electric Energy Systems Theory an Introduction, TMG Pub., 1982.

Guile, A. and Paterson, W., Electrical Power Systems, Pergamon Press, 1977.

14. Program Development Plan

1. Putting plans to develop curriculums and the vocabulary of curriculums to achieve sustainable development.
2. Providing software and virtual e-learning systems based on electronic platforms to support the continuation of the educational process.
3. Putting necessary plans and mechanisms to develop the scientific laboratories of the branch by supplying them with modern devices and

equipment with solid scientific origins to ensure the best practical training for students and in accordance with the field of work to serve society and to achieve the highest levels of sustainable development.

4. Using new concepts in the field of electrical engineering science.

Program Skills Outline															
			Required program Learning outcomes												
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2023-2024 First Year First Semester	DEHR105	Democracy and Human Rights	C	*	*	*	*	*	*	*	*	*	*	*	*
	WSHE106	Workshops	C	*	*	*	*	*	*	*	*	*	*	*	*
	COSC108	Computer	C	*	*	*		*	*	*		*	*	*	
	EDAC111	Engineering Drawing and AutoCAD	C	*	*	*		*	*	*		*	*	*	
	FUEE112	Fundamentals of Electrical Engineering 1	C	*	*	*		*	*	*	*	*	*	*	*
	MATH113	Mathematics 1	C	*	*			*	*	*		*			
	MEEN114	Mechanical Engineering	C	*	*	*				*		*	*	*	
2023-2024 First Year Second Semester	WSHE106	Workshops	C	*	*	*	*	*	*	*	*	*	*	*	*
	ENLA107	English Language	C	*	*	*		*	*	*		*	*	*	
	DITE121	Digital Techniques	C	*	*	*	*	*	*	*	*	*	*	*	*
	FUEE122	Fundamentals of Electrical Engineering 2	C	*	*	*	*	*	*	*	*	*	*	*	*
	MATH123	Mathematics 2	C	*	*	*		*	*	*		*	*	*	
	PHEL124	Physics of Electronics	C	*	*	*	*	*	*	*	*	*	*	*	*
	EEU211	Crimes of the Ba'ath regime in Iraq	C	*	*	*	*	*	*	*	*	*	*	*	*
	EEB212	Engineering Mathematics I	C	*	*	*	*	*	*	*	*	*	*	*	*

2023-2024 Second Year First Semester	EEB213	Probability Theory and Engineering Statistics	C	*	*			*	*			*	*		
	EEB214	Electromagnetic Fields I	C	*	*	*	*	*	*	*	*	*	*	*	*
	EEE215	Analog Electronics I	C	*	*	*		*	*			*	*	*	*
	EEE216	Electrical Circuits I	C	*	*	*		*	*	*	*	*			
	EEE217	DC Machines	C	*	*	*	*	*	*	*	*	*	*	*	
	EEC218	Computer Programming	c	*	*			*				*	*	*	*
	EEP219	Analog Electronics Lab. I and DC Machines Lab.	C	*	*	*		*	*	*	*	*			
2023-2024 Second Year Second Semester	EEU221	Technical English II	C	*	*			*				*	*	*	*
	EEU222	Human Rights and Democracy	C	*	*	*	*	*	*	*	*	*	*	*	*
	EEB223	Engineering Mathematics II	C	*	*	*	*	*	*	*		*	*	*	*
	EEB224	Electromagnetic Fields II	C	*	*	*	*	*	*	*	*	*	*	*	*
	EEE225	Analog Electronics II	C	*	*	*		*	*			*	*	*	*
	EEE226	Electrical Circuits II	C	*	*	*		*	*	*	*	*			
	EEE227	AC Machine I	C	*	*	*		*	*	*	*	*			
	EEC228	Instrumentation and Measurements	C	*	*	*	*	*	*	*		*	*	*	*
	EEP229	Analog Electronics Lab. II and AC Machines Lab. I	C	*	*	*	*	*	*	*	*	*	*	*	
2023-2024 Third Year First Semester	EE31 01	Electrical Power Engineering	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE31 02	AC Machines II	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE31 03	Microprocessor Engineering I	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE31 04	Engineering Analysis I	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE31 05	Control Engineering I	C	*	*	*		*	*	*		*	*	*	*
	EE31 06	Communication Engineering I	C	*	*	*	*	*	*	*		*	*	*	*
	EE31 07	Human Rights & Engineering Skills and Ethics	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE31 08	Electrical Engineering Lab. III	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE31 09	Control Lab.	C	*	*	*	*	*	*	*	*	*	*	*	*

2023-2024 Third Year Second Semester																
	EE32 10	High Voltage Engineering	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE32 11	AC Machines III	C	*	*	*		*	*	*		*	*	*	
	EE32 12	Microprocessor Engineering II	C	*	*	*		*	*			*	*	*	*
	EE32 13	Engineering Analysis II	C	*	*	*	*	*	*	*	*	*		*	*
	EE32 14	Control Engineering II	C	*	*	*		*	*	*		*	*	*	*
	EE32 15	Communication Engineering II	C	*	*	*		*	*	*		*	*	*	*
	EE32 16	Electronics III	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE32 17	Electrical Engineering Lab. IV	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE32 18	Communication Lab.	C	*	*	*	*	*	*	*	*	*	*	*	*
2023-2024 Fourth Year First Semester	EE41 01	Final Year Project I	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE41 02	Power System Analysis I	C	*	*	*		*	*	*		*	*	*	*
	EE41 03	Elective Subject I	O	*	*	*	*	*	*	*	*	*	*	*	*
	EE41 04	AC Machines IV	C	*	*	*	*	*	*	*		*	*	*	*
	EE41 05	Power Electronics I	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE41 06	Electronics IV	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE41 07	Industrial Management	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE41 08	Electrical Engineering Lab. V	C	*	*	*	*	*	*	*	*	*	*	*	*
2023-2024 Fourth Year Second Semester	EE42 09	Final Year Project II	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE42 10	Power System Analysis II	C	*	*	*		*	*	*		*	*	*	*
	EE42 11	Elective Subject II	O	*	*	*		*	*	*		*	*	*	
	EE42 12	Electrical Machines Drives	C	*	*		*	*	*		*	*	*	*	*
	EE4213	Power Electronics II	C	*	*	*	*	*	*	*	*	*	*	*	*
	EE42 14	Communication Engineering III	C	*	*	*		*	*	*		*	*	*	*
	EE42 15	Operations Research	C	*	*	*	*	*	*	*		*	*	*	*
	EE42 16	Electrical Engineering Lab. VI	C	*	*	*	*	*	*	*	*	*	*	*	*

Course Description Form

1. Course Name:
High Voltage Engineering
2. Course Code:
EE32 10
3. Semester / Year:
2nd Semester / 2023−2024
4. Description Preparation Date:
3−1−2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours / 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Aws Habeeb Mohammed Al-Taie Email: aws.h.mohammed@uotechnology.edu.iq
8. Course Objectives

Course Objectives	• Gain the theoretical and experimental knowledge regarding the electrical insulation systems • Be familiar with the high voltage engineering techniques. • Design electrical insulation systems for power devices
9. Teaching and Learning Strategies	
Strategy	Teaching strategies include the presentation of a theoretical background with the aid of white board and the Data Show which serves demonstrating pictures, figures, and videos. Giving examples and exercises, with using textbooks. In addition, lab is visited periodically for the demonstration of the taught materials and subjects. Finally, For the purpose of evaluation, weekly oral and written quizzes, homework, and midterm exam are used.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1-2	4	High Voltage Concepts	Electric stress and electric strength. Breakdown in vacuum and gases. Breakdown in solids and liquids. High voltage measurements. Testing voltages.	White board and the Data Show	Quiz, HW, Exam
3-5	6	Generation of High Voltages	DC voltages. AC to DC conversion. Electrostatic generators. AC voltages. Testing transformers. Series resonant circuits. Impulse voltage generator circuits.	White board and the Data Show	Quiz, HW, Exam
6-9	8	Measurement of High Voltages	Peak voltage measurement by spark gap. Electrostatic voltmeters. Ammeter in series with voltage divider generating voltmeter. The Chubb-Fortescue methods. Passive and active circuits. High voltage capacitors. Generalized voltage generation and measuring circuit. Potential dividers.	White board and the Data Show	Quiz, HW, Exam
10-13	8	Non-Destructive Insulation Test Techniques	High voltage dielectric loss and capacitance measurements. The Schering Bridge.	White board and the Data Show	Quiz, HW, Exam

			Transformer-ratio Arm Bridge. Null detectors. Partial discharge measurements and equivalent circuit.		
14-15	4	Overvoltages and Insulation Coordination	The lightning mechanism. Lightning surges for testing. Switching surge test voltage characteristics. Insulation coordination.	White board and the Data Show	Quiz, HW, Exam

11. Course Evaluation

The distribution the class grades of the total 100 is as follows:
5% Oral and written quizzes
5% Homework
20% Midterm exam
70% Final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	E. Kuffel, & M. Abdullah, *High Voltage Engineering*, Pergamon Press, 1970.
Main references (sources)	E. Kuffel & W. S. Zaengl, *High Voltage Engineering*, Pergamon Press, 1984.
Recommended books and references (scientific journals, reports…)	C.L. Wadhwa High voltage engineering, second edition, New Age International, 2007.
Electronic References, Websites	https://ieeexplore.ieee.org/Xplore/home.jsp