

**PG and Research Department of Physics**  
**Minutes of the Board of Studies in Physics (UG) Meeting held on 6-11-2022**

A Meeting of the Board of studies in Physics (UG) was held in online mode through Google meet on 6-11-2022 at 11 am. The following members were present for the meeting.

Chairman: Dr. A. Albert Irudayaraj

Members:

- Mr. C. Tirupathi
- Mr. D. Daniel Lawrence
- Mr. M. Aravinthraj
- Mr. R. Ramesh
- Mr. D. Rajkumar
- Dr. A. Dhayal Raj
- Mr. N. Madhavan
- Dr. M. Jose
- Dr. S. A. Martin Britto Dhas
- Rev. Dr. G. Theophil Anad
- Mr. G. Jayakumar
- Dr. L. Anandaraj
- Dr. S. John Sundaram
- Rev. Dr. Gandhi Kallarasan
- Dr. P. Kannappan

University Nominee : Dr. D. Jaikumar,  
Assistant Professor & HOD of Physics,  
Voohrees College,  
Vellore-632001.

Subject Expert : Dr. J. Suresh  
Associate Professor & Principal  
The Madura College  
Madurai-625 011

Industrialist : Mr. S. Naresh,  
HR Representative II, Caterpillar India Pvt. Ltd.,  
Small Drivetrain systems,  
Hosur.

Student representatives: A. Isaac Brotherton (AU200324), III B. Sc. Physics  
A. Shiny (AU200317), III B. Sc. Physics  
R. Sonia (BU200318), III B. Sc. Physics  
I. Imran (BU200302), III B. Sc. Physics

**Members Absent :**

Mr. M. Selvam (Alumnus) and Dr. S. Kalaiarasi did not attend the meeting.

**Agenda:**

- To discuss and approve the Course outcomes (CO) for all the courses offered under choice based credit system in the III and IV semesters of B. Sc. Physics program and Allied Physics courses offered in the III and IV semesters of B. Sc. Chemistry and B. Sc. Computer Science programs for students admitted during 2021-22 and thereafter.

**Resolution:**

- Considered the Course outcomes (CO) for the Physics courses offered under choice based credit system in the III and IV semesters of B. Sc. Physics program and Allied Physics courses offered in the III and IV semesters of B. Sc. Chemistry and B. Sc. Computer Science programs for students admitted during 2021-22 and thereafter.

After due deliberations and detailed discussion, it was decided to approve the following Course outcomes (CO) for the Physics courses offered under choice based credit system in the III and IV semesters of B. Sc. Physics program and the Allied Physics courses offered in the III and IV semesters of B. Sc. Chemistry and B. Sc. Computer Science programs for students admitted during 2021-22 and thereafter.

**Suggestion :**

- Dr. D. Jaikumar, University nominee suggested that the title of the Allied Physics courses may be changed as Allied Physics – I (for Chemistry), Allied Physics – II (for Chemistry), Allied Physics – I (for Computer Science), and Allied Physics – II (for Computer Science).

Programme structure ( III & IV semesters) of B.Sc. Physics under CBCS

Sem	Paper	Title of the Paper	Hours/ Week	Credits	Marks	
					CA	Sem
III	Main Core	<b>Electricity and Magnetism</b>	3	3	50	50
	Main Core	<b>Optics</b>	3	3	50	50
	Main Core Practicals	<b>Physics Main Practicals – II</b>	4	4	50	50
	Allied	Allied Chemistry –I	4	3	50	50
	Allied	Allied Chemistry Lab work	2	1	50	50
	Language	Tamil	5	3	50	50
	Language	General English	5	3	50	50
	Life Education	Employability Skills –1	2	1	50	50
		Environmental Science	2	1	50	50
	Extra credit Course	1. Special Project- I 2. NPTEL online courses	-	2 <sup>#</sup>	100	
<b>TOTAL</b>			<b>30</b>	<b>22+2<sup>#</sup></b>		

Sem	Paper	Title of the Paper	Hours/ Week	Credits	Marks	
					CA	Sem
IV	Main Core	<b>Modern Physics</b>	3	3	50	50
	Main Core	<b>Electromagnetism</b>	3	3	50	50
	Main Core Practicals	<b>Physics Main Practicals – II</b>	4	4	50	50
	Allied	Allied Chemistry –II	4	3	50	50
	Allied	Allied Chemistry Lab work	2	1	50	50
	Language	Tamil	5	3	50	50
	Language	General English	5	3	50	50
	Life Education	Employability Skills –2	2	1	50	50
		Human Rights	2	1	50	50
	Extra Credit Course	1. Special Project II (Repair and Maintenance of Lab Equipments) 2. Internship	-	2 <sup>#</sup>	100	
	Extension	Outreach program	-	2		
		SHELTERS	-	2		
<b>TOTAL</b>			<b>30</b>	<b>26+2<sup>#</sup></b>		



Allied Physics courses offered in III & IV semesters

Sem	Paper	Title of the Paper	Hours / Week	Credits	Marks	
					CA	Sem
III	Allied -I	Allied Physics for Chemistry - I	4	3	50	50
	Allied practicals	Allied Physics practicals for Chemistry	2	1	50	50
IV	Allied -II	Allied Physics for Chemistry - II	4	3	50	50
	Allied practicals	Allied Physics practicals for Chemistry	2	1	50	50
III	Allied -I	Allied Physics for Computer Science - I	4	3	50	50
	Allied practicals	Allied Physics practicals for Computer Science	2	1	50	50
IV	Allied -II	Allied Physics for Computer Science -II	4	3	50	50
	Allied practicals	Allied Physics practicals for Computer Science	2	1	50	50

Course outcomes (CO) for all the Physics courses offered in the III and IV semesters of B. Sc. Physics program and Allied Physics courses offered in the III and IV semesters of B. Sc. Chemistry and B. Sc. Computer Science programs :

Electricity and Magnetism

Semester: III

Hours / Week: 3

Course code:

Credits: 3

Objectives

- To introduce to the students the basic concepts of Electrostatics
- To make the students understand concepts on working and applications of capacitors and electrometers
- To explain the principle and working of Potentiometer and Carey Foster's Bridge. Also to understand the working of LCR and resonance circuits.
- To provide an overview of the fundamental principles of Coulomb's law, Biot-Savart law and magnetostatics.
- To make the students understand the various types of magnetism.

## Course Learning outcomes

Sl. No.	Course outcomes	Knowledge level
	On successful completion of the course, the students will be able to	
CO1	Explain and differentiate between electric field and electric potential and also illustrate the coulomb's law and its applications	K2, K3, K4
CO2	Understand the functions and the basic principles of capacitors and electrometers.	K2, K1
CO3	Explain the working principle of Carey-Foster bridge and Potentiometer and apply their knowledge to set up experiments in the laboratory.	K2, K3, K5
CO4	State and explain various laws of magnetostatics and illustrate their applications.	K1, K2, K3
CO5	Compare the properties of Dia, Para and Ferro magnetic materials and identify the form of magnetism possessed by a material	K6, K2

### Unit I: Electrostatics

Gauss law – charge inside the closed surface – charge outside the closed surface – insulated conductor – electric field due to a uniformly charged sphere – Coulomb's law – electric field intensity – electric induction – electric potential – electric current – relation between electric field and electric potential in vector form – potential due to the charged conducting sphere – Poisson's and Laplace's equations

### Unit II: Capacitors and Electrometers

Capacitance – principle of a capacitor – capacitance of spherical (inner sphere earthed and outer sphere earthed) and cylindrical capacitors – energy of a charged capacitor – energy density – loss of energy due to sharing of charges

Electrometers – Kelvin's attracted disc electrometer – measurement of potential difference and relative permittivity of a dielectric slab – Quadrant electrometer – heterostatic and idiostatic uses



### **Unit-III: Current Electricity**

Carey foster's bridge – theory – measurement of resistance and temperature coefficient of resistance of a coil – Potentiometer – principle – resistance of potentiometer wire – calibration of ammeter – calibration of voltmeter (low range and high range) – LCR Circuit – series resonant circuit – parallel resonant circuit – comparison between series and parallel resonant circuits

### **Unit IV: Magnetostatics**

Ampere's circuital law – curl of magnetic field – Biot-Savart law – magnetic induction at a point on the axis of a circular coil carrying current – Force on a current carrying conductor placed in a magnetic field – theory of moving coil ballistic galvanometer – damping correction – figure of merit of BG – absolute capacitance of a capacitor

### **Unit - V: Magnetism**

Magnetic properties of materials: Magnetic intensity, permeability, magnetic susceptibility – relation between the three magnetic vectors B, H and M – Curie temperature – Magnetic materials: dia, para, ferro, antiferro, ferri – electron theory of magnetism – Langevin's theory of dia magnetism and para magnetism – general applications of magnetic materials

### **Books for study**

1. R. Murugesan, Electricity and Magnetism, S. Chand & Co, New Delhi, 2019.
2. M. Narayanamurthy., N. Nagarathanam., Electricity & Magnetism, Meerut, National publishing Co, 2001.

### **Books for reference**


1. K. K. Tewari, Electricity and Magnetism, Magnetism, S Chand & co., New Delhi, 2001.
2. Brijlal and N. Subramanyan, Electricity and Magnetism, Agra., Ratan & Prakash, 1995.
3. D. L. Shegal, K. L. Chopra, N. K. Sehgal, Electricity and Magnetism, Sultan Chand & Sons., New Delhi, 2006.
4. B. D. Dugal and C. L. Chopra. Fundamentals of Electricity and Magnetism, Shobanlal Nagin Chand, New Delhi, 2000.
5. Edward Purcell, Electricity and Magnetism, Cambridge University press, United Kingdom, 2011.
6. Dugald C. Jackson, An elementary book on Electricity, Magnetism and their Applications, The Macmillian Company, New York, 1994.

## Books for reference

1. Jain, A text book of Practicals in Electronics, Dhanpat Rai Pub Company, 2016.
2. L. K. Maheshwari, M. M. S. Anand, Laboratory Manuel for Introductory Electronics Experiments, New Age International, 2008.
3. K. Close, Experimental Electronics for students, Springer Science & Business Media, 2012.
4. C.C. Ouseph, U. J. Rao, V. Vijayendran, Practical Physics and Electronics, S. Viswanathan Pvt. Ltd., Chennai, 2012.
5. B. Sasikala, Electronics Laboratory Primer, S. Chand Publishing, 2008.
6. M. N. Srinivasan, S. Balasubramanian, and R. Ranganathan, A Text Book of Practical physics, 2<sup>nd</sup> revised edition, S. Sultan Chand & Sons publications, 2014.

Chairman:

Dr. A. Albert Irudayaraj

  
7/11/22

Members:

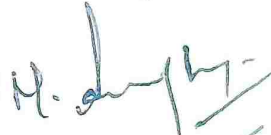
Mr. C. Tirupathi



Mr. D. Daniel Lawrence



Mr. M. Aravinthraj



Mr. R. Ramesh



Mr. D. Rajkumar



Dr. A. Dhayal Raj

  
7/11/22

Mr. N. Madhavan



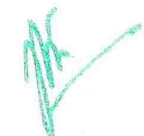
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R. Sonia (BU200318), III B. Sc. Physics   
I. Imran (BU200302), III B. Sc. Physics 

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**PG and Research Department of Physics**  
**Minutes of the Board of Studies in Physics (UG) Meeting held on 23-3-2023**

A Meeting of the Board of studies in Physics (UG) was held on 23-3-2023 at 11 am in the Board room. The following members were present for the meeting.

Chairman: Dr. A. Albert Irudayaraj

Members:

Mr. C. Tirupathi  
 Mr. D. Daniel Lawrence  
 Dr. M. Aravinthraj  
 Miss. S. Kalaiarasi  
 Dr. R. Ramesh  
 Mr. D. Rajkumar  
 Dr. A. Dhayal Raj  
 Mr. N. Madhavan  
 Dr. M. Jose  
 Dr. S. A. Martin Britto Dhas  
 Rev. Dr. G. Theophil Anand  
 Mr. G. Jayakumar  
 Dr. L. Anandaraj  
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 Dr. P. Kannappan

University Nominee :

Dr. D. Jaikumar,  
 Assistant Professor & HOD of Physics,  
 Voohees College, Vellore-632001.

Subject Expert :

Dr. J. Suresh  
 Associate Professor & Principal  
 The Madura College  
 Vidya Nagar, T.P.K. Road,  
 Madurai-625 011

Alumnus:

Mr. M. Selvam,  
 Assistant Head Master,  
 Higher secondary School, Palnakupam,  
 Tirupattur.

Student representatives:

A. Isaac Brotherton (AU200324), III B. Sc. Physics  
 S. Shiny(AU200317), III B. Sc. Physics  
 R. Sonia (BU200318), III B.Sc. Physics  
 I. Imran (BU200302), III B.Sc. Physics

Mr. S. Naresh (Industrialist) expressed his inability to attend the meeting.

### Agenda:

- To discuss and approve the Course Outcomes (CO) for all the courses offered in the V and VI semesters of B. Sc. Physics program and Non major elective courses offered under choice based credit system, for students admitted during 2021-22 and thereafter.
- To discuss and approve the guidelines for internship program offered for B. Sc. Physics students admitted during 2021-22 and thereafter.
- To discuss and pass the syllabi of the two skill elective courses (value added courses) 'Cell phone servicing' and 'Repair and Maintenance of Domestic Electrical Appliances' to be offered by the department of Physics during the academic year 2023-'24 and thereafter.

### Resolutions:

- Considered the Course Outcomes (CO) for all the courses offered in the V and VI semesters of B. Sc. Physics program and Non major elective courses offered, under choice based credit system, for students admitted during 2021-22 and thereafter.

After due deliberations and detailed discussion, it was decided to approve the following Course outcomes (CO) for the courses offered in the V and VI semesters of B. Sc. Physics program and Non major elective courses offered, under choice based credit system, for students admitted during 2021-22 and thereafter.

- Considered the guidelines for internship program offered in the IV semester of B. Sc. Physics program for students admitted during 2021-22 and thereafter.

After due deliberations and detailed discussion, it was decided to adopt the following guidelines for internship program offered in the IV semester of B. Sc. Physics program for students admitted during 2021-22 and thereafter.

- Considered the syllabi of the two skill elective courses (value added courses) 'Cell phone servicing' and 'Repair and Maintenance of Domestic Electrical Appliances' to be offered by the department of Physics during the academic year 2023-'24 and thereafter.

After due deliberations and detailed discussion, it was decided to adopt the following syllabi of the two skill elective courses (value added courses) 'Cell phone servicing' and 'Repair and Maintenance of Domestic Electrical Appliances' to be offered by the department of Physics during the academic year 2023-'24 and thereafter.

Programme structure

Sem	Paper	Title of the Paper	Hours/ Week	Credits	Marks		
					CA	Sem	
IV	Main Core	Modern Physics	3	3	50	50	
	Main Core	Electromagnetism	3	3	50	50	
	Main Core Practicals	Physics Main Practicals – II	4	4	50	50	
	Allied	Allied Chemistry –II	4	3	50	50	
	Allied	Allied Chemistry Lab work	2	1	50	50	
	Language	Tamil	5	3	50	50	
	Language	General English	5	3	50	50	
	Life Education	Employability Skills –2	Human Rights	2	1	50	50
			1. Special Project II (Repair and Maintenance of Lab Equipments) 2. <b>Internship</b>	-	2 <sup>#</sup>	100	
	Extra Credit Course	Outreach program		-	2		
SHELTERS			-	2			
<b>TOTAL</b>			<b>30</b>	<b>26+2<sup>#</sup></b>			

Sem	Paper	Title of the Paper	Hours/ Week	Credits	Marks		
					CA	Sem	
V	Main Core	Classical mechanics and Statistical Physics	4	4	50	50	
	Main Core	Semiconductor devices and their Applications	4	4	50	50	
	Main Core	Solid State Physics	4	4	50	50	
	Main Core	Mathematical Physics	4	4	50	50	
	Main Core	Physics Main Practicals – III(General experiments)	3	3	50	50	
	Main Core	Physics Main Practicals – IV(Electronic experiments)	3	3	50	50	
	Subject Elective	1. Nanomaterials and their applications 2. Electronic communication systems 3. Renewable Energy and Energy Harvesting		3	2	50	50
			1. Programming in C	3	2	50	50



		2. 8085 Microprocessor and its applications 3. Medical Physics				
	Self-Study Paper	1. Astrophysics 2. Laser Physics and Fiber Optics	–	1*	100	
	Non-Major Elective	Offered by other departments	2	1	100	
<b>TOTAL</b>			<b>30</b>	<b>27+1*</b>		

Sem	Paper	Title of the Paper	Hours/Week	Credits	Marks	
					CA	Sem
VI	Main Core	Applied Electronics	5	5	50	50
	Main Core	Nuclear and Particle Physics	5	5	50	50
	Main Core	Quantum Mechanics and Relativity	4	4	50	50
	Main Core	Physics Main Practicals – III (General experiments)	2	2	50	50
	Main Core	Physics Main Practicals – IV (Electronic experiments)	2	2	50	50
	Subject skill	Electrical circuits and Networks	5	4	50	50
	Subject skill	Basic Instrumentation	5	4	50	50
	Self-Study Paper	Physics Revisited	–	1*	100	
	Non-Major Elective	Offered by other departments	2	1	100	
<b>Total</b>			<b>30</b>	<b>27+1*</b>		

Semester	I	II	III	IV	V	VI	TOTAL
Hours	30	30	30	30	30	30	180
Credits	24	24	22+2 <sup>#</sup>	26+2 <sup>#</sup>	27+1*	27+1*	150+4 <sup>#</sup> +2*

Paper	Sem	Title of the Paper	Hours / Week	Credits	Marks	
					CA	Sem
Non-Major Elective	V	Repair and Maintenance of Household Appliances (offered by Physics department to other department students)	2	1	100	-
Non-Major Elective	VI	Physics in Everyday Life (offered by Physics department to other department students)	2	1	100	-

Course objectives and Learning outcomes of courses in the V and VI semesters

Classical mechanics and Statistical Physics

Semester : V  
Course Code :

Hours/Week : 4  
Credits : 4

**Objectives**

- To revise Newtonian mechanics and introduce Lagrangian formulation of mechanics.
- To learn Hamilton's principle and Hamiltonian formulation of mechanics.
- To realize the reduction of a two-body problem to a one-body problem in a central force system.
- To understand the properties of macroscopic systems using the knowledge of the properties of individual particles.
- To know about classical and quantum statistics and their applications.

Sl. No.	Course outcomes	Knowledge level
	On successful completion of the course, the students will be able to	
CO1	Identify the motion of mechanical systems and apply the Lagrangian formalism to generate equations of motion for them.	K1, K3
CO2	Apply the knowledge of Hamilton's principle to solve physical problems, including simple pendulum, compound pendulum, linear harmonic oscillator.	K3, K4
CO3	Determine the differential equation of orbit, stability of orbit under central force field	K5

CO4	Understand concepts of statistical mechanics and find the connection between statistics and thermodynamics	K2, K1
CO5	Differentiate between classical statistics and quantum statistics	K3
CO6	Solve some problems like monoatomic gas, photon gas and electron gas and find the energy distribution of them using statistical distribution laws.	K6, K1

### Semiconductor Devices and their Applications

Semester- V  
Course Code:

Hours/week: 4  
Credits: 4

#### Course Objectives

- To introduce diodes and their types along with their applications
- To provide an overview of the principles, operation and applications of FET, MOSFET, UJT and SCR.
- To Provide an overview of small signal and large signal amplifiers.
- To Inculcating basic concepts about oscillators, their construction and working.
- To introduce an operational amplifier and their linear and non-linear applications.

#### Learning Outcomes

Sl. No.	Course outcomes	Knowledge level
	On successful completion of the course, the students will be able to	
CO1	explain the implications of characteristics of various types of diodes and different rectification process.	K2,K4,K5
CO2	acquiring knowledge on Fabrication of a transistor, JFET, MOSFET, UJT and SCR	K1
CO3	demonstrate the basic concept behind the working of a transistor amplifier, and able to explain the working of R-C coupled amplifier and calculate the gain of multistage amplifiers.	K2,K3
CO4	demonstrate the basic concept behind the working of an oscillator and multivibrators.	K2,K3
CO5	solving various mathematical operations like summing, difference, integrators, differentiators, sign changers etc., using operational amplifier	K3,K6



CO2	explain the origin and applications of sound waves	K2
CO3	explain applications of heat in everyday life	K2
CO4	Rectify the faults in electrical heating devices	K3
CO5	describe the salient features of objects in the universe	K1

### Guidelines for Internship Program for Undergraduate Students

1. Internship programme (in IV semester) is optional (extra credit course) for B. Sc. Physics students.
2. Students may go for internship during summer vacation in IV semester.
3. Interested students should arrange for internship by themselves.
4. Students should go to an Institute/Industry for a period of minimum two weeks and carry out a project/ undergo training.
5. Before undertaking the internship the students should submit the following to the department
  - the Confirmation Letter / Email from the institute/industry
  - the letter of consent from the parents
6. After completing the internship the students should submit the following to the department
  - training/project report
  - Attendance certificate obtained from industry/Organization.
7. The Project/training report will be evaluated by the II B. Sc. Physics class teacher.
8. List of students who have completed their internship and who are eligible for extra credits will be issued by department to COE.

### Skill Elective Courses offered by the Department of Physics(UG)

#### Skill Elective - I

#### Cell Phone Servicing

#### Course Objectives

(30 Hours)

- To provide an insight into the basic concepts of mobile communication and various technology standards used around the world.

- To introduce the students to various sections on the motherboard of a mobile phone device, their functions and uses.
- To learn the cell phone hardware repair procedures in a more comprehensive manner.
- To gain an understanding of various software repairing techniques.
- To acquire skill in circuit tracing and troubleshooting through internet.

### **Learning Outcomes**

After completing the course, the students will be able to

- Gain an understanding of the basic concepts of mobile communication and various technology standards used around the world.
- Describe the various sections on the motherboard of a mobile phone device, their functions and uses.
- Learn all the hardware repair procedures in a more comprehensive manner.
- Acquire software repairing skills.
- Perform circuit tracing and troubleshooting through internet.

### **Unit I**

Introduction to mobile phones, Generations of mobile phones, FHSS networks, GSM, Spread spectrum, CDMA, TDMA.

Introduction to different types of mobile cell phones- Introduction and working principle of different sections of Mobile phones .

### **Unit II**

#### **Cellphone Hardware**

Introduction and study about Motherboard (Printed circuit board)-Details of components in the motherboard-Testing of various components and parts-study of ICs used on the motherboard-Recognition of chips.

### **Unit III**

#### **Hardware Repairing**

Tools & equipment used for repairing & maintenance of mobile handsets-Handsets assembly& disassembly (How to remove and fix All Mobile Components like Charger jack, Mic jack, Camera,

speaker, jumper, SIM, Headphone jack etc.)-Soldering and Desoldering of components using a soldering iron and rework station-Mounting and Reheating of various SMD(Surface Mount Device) and BGA(Ball Grid Array) chips-Types of power supply & batteries- boosting a battery-Troubleshooting basics -Troubleshooting, fault finding and repairing of various faults-Changing/removing mobile screen (folder) & Mobile screen repair-Mobile phone hardware troubleshooting (water damage, hanging, charging & keypad problems, Power failure (dead))- Mobile camera and circuit tracing and repair.

#### **Unit IV**

##### **Software Repairing**

Faults which arises when Software corrupt-Introduction of various software and flasher boxes- Removal of the virus from the infected phones-Unlocking of phones through software or codes- Various secret codes.

#### **Unit V**

##### **Advanced Troubleshooting**

Repair procedure in case of Hardware issue-Repair procedure in case of a Software issue-Circuit tracing; Jumper techniques and solutions-Internet use for solving troubleshooting problems- Advanced troubleshooting techniques.

#### **Books for Reference**

1. Learn Cell Phone Repairing, Muhamed Asif Azeemi, Kindle Edition, 2019
2. Mobile Phones and Tablets Repairs, Chukky Operandu, Mondraim Nig Ltd., 2016
3. Cell Phone Repair Guide for Beginners, Hossne Mamun, Amazon Publishing, 2021.

#### **Websites To Learn Mobile Repairing**

- [iFixit.com](http://iFixit.com), [ifixit.com](http://ifixit.com)
- Cellphone repair tutorials
- [Allgsmtips.com](http://Allgsmtips.com)
- [Vkrepare.com](http://Vkrepare.com)
- [Mobilerepairingonline.com](http://Mobilerepairingonline.com)
- GSM-Forum



- REWA Technology
- Youtube.

**Skill Elective - II**  
Repair and maintenance of Domestic Electrical Appliances

(30 Hours)

**Course Objectives**

- To gain knowledge on working principles, testing and repairing of Electric Iron, Water Heater & Geyser
- To acquire knowledge of various parts of Oven, Toaster, Griller and learn to test, detect faults and trouble shoot.
- To acquire basic skill in dismantling, re-assembling and troubleshooting of Electric Fan and Exhaust fan.
- To familiarize diagnosing, detecting and repairing of faults in electric mixer and grinder.
- To understand the operation, servicing and maintenance of Water purifier and to learn about Electrical Hazards and Safety measures.

**Learning outcomes**

After completion of the course, the students will be able to

- gain knowledge on working principles, testing and repairing of Electric Iron, Water Heater & Geyser
- acquire knowledge of various parts of Oven, Toaster, Griller and learn to test , detect faults and trouble shoot.
- acquire basic skill in dismantling, re-assembling and troubleshooting of Electric Fan and Exhaust fan.
- diagnose, detect and repair faults in electric mixer and grinder.
- understand the operation, servicing and maintenance of Water purifier and to learn about Electrical Hazards and Safety measures.

### **Unit I**

**Electric Iron** - Principle, working, types(automatic and Non-automatic), specification, maintenance and trouble shooting.

**Water Heater & Geyser** : Principle, working, maintenance and trouble shooting.

### **Unit II**

**OTG (Oven, Toaster, Griller)** - Block Description - Basic Working Principle- Fault identification - trouble shooting.

### **Unit III**

**Electric fans** - Types of Fans; ceiling fan, table fan, exhaust fan- installation- testing- common faults and their causes- trouble shooting.

### **Unit IV**

**Electric Mixer and Grinder**- Working principle, common faults and their causes- trouble shooting.

### **Unit V**

**Water purifier** - Working principle - Fault identification- Possible causes and solution.

Understanding drawings, circuit diagrams and electrical code specifications of the electrical equipment and gadgets-Understanding the capacity in kW, load in Amperes and power consumption in kWh for each appliance-Electrical Hazards and Safety measures(Electrical Hazards and its effects - Basic safety introduction - Personal protection and PPE - Basic injury prevention - Basic first aid - Hazard identification and avoidance).

### **Books for Reference**

1. Household Electricity and Appliances, S. C. Bhargava, B. S. Publications, 2020.
2. Testing, Commissioning, Operation and Maintenance of Electrical Equipments, S. Rao, Kanna Publishers, 1991.
3. Study of Electrical Appliances and Devices, K.B.Bhatia, Khanna Publishers, 1988.

Suggestions:

Dr. J. Suresh, the subject expert suggested that mapping the course outcomes with the levels K5 and K6 are not possible at the UG level.

Dr. J. Suresh, the subject expert suggested that the syllabus content must be in line with the TANCHE syllabus.

Dr. J. Suresh, the subject expert suggested that the credits should not exceed the hours of contact.

Dr. J. Suresh, the subject expert suggested that internship reports must be evaluated and the credits must be awarded based on the evaluation.

Student representative Ms. Shiny requested that the syllabus content of Electronic communication system paper in V semester may be reduced.

After discussion, the following titles were suggested by the board for the skill elective courses (value added courses).

1. **Cell Phone and laptop servicing**
2. **Repair and maintenance of electrical appliances**

Dr. A. Albert Irudayaraj  
Chairman

*Albert*  
23/4/23

Dr. D. Jaikumar  
University Nominee

*D. Jaikumar*

Dr. J. Suresh  
Subject Expert

*J. Suresh*



Mr. M. Selvam  
Alumnus

*601-0000000*

**Members :**

Mr. C. Tirupathi

*[Signature]*

Mr. D. Daniel Lawrence

*[Signature]*

Dr. M. Aravinthraj

*M. Aravinthraj*

Dr. S. Kalaiarasi

*[Signature]*

Dr. R. Ramesh

*[Signature]*

Mr. D. Rajkumar

*[Signature]*

Dr. A. Dhayal Raj

*A. Dhayal Raj*

Mr. N. Madhavan

*N. Madhavan*

Dr. M. Jose

*[Signature]*

Dr. S. A. Martin Britto Dhas

*[Signature]*

Rev. Dr. G. Theophil Anand

*[Signature]*

Mr. G. Jayakumar

*[Signature]*

Dr. L. Anandaraj

*[Signature]*

Dr. S. John Sundaram



Rev. Dr. Gandhi Kalarasan

**Student representatives:**

A. Isaac Brotherton (AU200324), III B. Sc. Physics



S. Shiny (AU200317), III B. Sc. Physics



R. Sonia (BU200318), III B.Sc. Physics



I. Imran (BU200302), III B.Sc. Physics

