

Govt. Polytechnic Hamirpur (H.P.)

Lesson Planning (Theory)

Branch : Electrical Engg.

Subject : ELECTRICAL ESTIMATING AND CONTRACTING

Teacher : Parveen Dogra

Semester: 4th

Session: Jan-May, 26

Cass Room :

| Sr. No. | No. of Lectures | Chapter/ Unit Description | Detail of Contents | Reference Resources | Remarks |
|---------|-----------------|---|--|---------------------|---------|
| 1. | 1-10 | Electric Installation and Safety | Scope and features of National electric code 2011 Types of electrical installation Fundamental principles for electrical installation Permit to work, safety instructions and safety practices. Purpose of estimating and costing. | R1,R2, R3,R4,R5,R6 | |
| 2. | 11-19 | Estimation and Costing | Meaning and purpose of - rough estimate, detailed estimate, supplementary estimate, annual maintenance estimate and revised estimate Factors to be considered while preparation of detailed estimate and economical execution of work Contracts. Concepts of contracts, types of contracts, contractor, role of contractor Tenders and Quotations- Type of tender, tender notice, preparation of tender document, and method of opening of tender, Quotation, quotation format, comparison between tender and quotation Comparative statement, format comparative statement. Order format, placing of purchasing order. Principles of execution of works, planning, organizing and completion of work, Billing of work | -do- | |
| 3. | 20-30 | Non-Industrial Installations | Types of Non-industrial installations-- Office buildings, shopping and commercial centre, residential installation, Electric service and supply Design consideration of electrical installation in commercial buildings. Design procedure of installation- steps involved in detail, Estimating and costing of unit earthing of commercial installation. Design electrical installation scheme of commercial complex. Erection, Inspection and testing of installation as per NEC | -do- | |
| 4. | 31-41 | Industrial Installation | Classification of industrial buildings Classification based on power consumption, Drawing of wiring diagram and single-line diagram for single phase and three phase Motors. Design consideration in industrial installations Design procedure of installation-detailed steps Design electrical installation scheme of factory/small industrial unit, Preparation of material schedule and detailed estimation Installation and estimation of agricultural pump and flour mill. | -do- | |
| 5. | 42-49 | Public Lighting Installation | Classification of outdoor installations streetlight/ public lighting installation Street light pole structures. Selection of equipments, sources used in street light installations. Cables, recommended types and sizes of cable. Control of street light installation. Design, estimation and costing of street light. Preparation of tenders and abstracts. | -do- | |
| 6. | 50-57 | Distribution Lines and LT Substation | Introduction to overhead and underground distribution line. Materials used for distribution line HT and LV Cables used for distribution line, factors determining selection of LT/ HT power Cables, cable laying and cable termination method according to IS Design, estimation and costing of HT LT overhead line and underground cabling. Types of 11 KV Distribution substations their line diagram, Estimation of load, Load factor, diversity factor and determination of rating of distribution. Transformer. Design, estimation and costing of outdoor and indoor 11 KV substation | | |

Parveen Dogra
27.01.26
Signature of Teacher with Date

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Signature of HOD (EE)

Reference Resource:

R1: Raina, K.B.; Dr. S. K. Bhattacharya New Age International Publisher First, Reprint 2010, Electrical Design Estimating and Costing ISBN: 978-81-224-0363-3

R2. Allagappan,, N. S. Ekambarram, Tata Mc-Graw Hill Publishing Co. Ltd, Electrical Estimating and Costing, ISBN 13: 9780074624784.

R3. Singh, Surjit Ravi Deep Singh, Dhanpat Rai and Sons, Electrical Estimating and Costing, ISBN 13:1234567150995

R4. Gupta, J.B. S.K. Kataria and Sons Reprint Edition, A Course in Electrical Installation Estimating and Costing ISBN 10: 935014279113: 978-9350142790.

R5. Bureau of Indian Standard. IS: 732-1989, Code of Practice for Electrical Wiring Installation R6. Bureau of Indian Standard. SP-30:2011, National Electrical Code 2011

Govt. Polytechnic Hamirpur (H.P.)

Lesson Planning (Theory)

Branch : ELECTRICAL ENGG

Semester: 4th

Subject : Essence Of Indian Knowledge Tradition

Session: Jan- May, 2026

Teacher: SHIKHA

Class Room: L1

| S.No | No. of Lectures | Chapter/ Unit Description | Detail of Contents | Reference Resources | Remarks |
|------|-----------------|---------------------------------------|---|---------------------|---------|
| 1 | 1-7 | Indian Knowledge System (IKS) | Introduction and Function of Indian Knowledge System (IKS).The Basic Structure of Indian Knowledge System(IKS) (only Introduction). The 4 Vedas, Namly ऋग्वेद (Rigveda) , यजुर्वेद (Yajurveda), सामवेद (Samaveda) , अथर्ववेद (Atharvaveda), The 4 UpVedas, Namely आयुर्वेद (Ayurveda (health-care)), धनुर्वेद (Dhanurveda (archery)), गंधर्ववेद (Gandharva-veda (dance, music etc.)) and स्थापत्यवेद (Sthapatyaveda (architecture)), The 6 Vedagangs, namely Shiksha (शिक्षा), Kalpa (कल्प), Vyakarṇa (व्याकरण), Chhandas(छंदस्), Nirukta (निरुक्त), and Jyotisha(ज्योतिष).Itihasa (इतिहास) (Ramayanaरामायण and Mahabharata महाभारत) and Puranaपुराण (Vishnupuranaवष्णुपुराण, BhagavataPurana (भागवतपुराण) etc.). Dharmashatraधर्मशास्त्र (Manusmritiमुस्मन्त, Yajnavalkya-smritियाज्ञवल्कव्य, स्मन्त etc.). Darshanदर्शवि (आस्तकतथािास्तक). Nyayaन्याय (Logic तर्कशास्त्र and Epistemology ज्ञािमीमासा). | R1,R2 | |
| 2 | 8-12 | Modern Science | Modern science: Introduction, Characteristics, importance and Example. Difference between modern Science and Indian knowledge system. Role of IKS in modern science | R1,R2 | |
| 3 | 13-16 | Traditional knowledge | Traditional knowledge: Definition, nature, characteristics, scope and importance. Indigenous Knowledge (IK): characteristics. Traditional knowledge vis-a-vis Indigenous knowledge. Traditional knowledge Vs western knowledge. The need for protecting traditional knowledge | R1,R2 | |
| 4 | 17-23 | Yoga and Holistic Health Care | Yoga: Meaning and Importance of Yoga. Yoga and physical health, Yoga and psychological health, Yoga and intellectual health, Yoga and spiritual health, Yoga and social approach. Introduction to Ashtanga Yoga, Yogic Kriyas (Shat Karma). Pranayama and its types; Active lifestyle and stress management through Yoga. Physical Fitness, Health and wellness: Meaning and Importance of Wellness, Components of Wellness, Health and physical Fitness; Traditional sports & Regional Games for promoting wellness: Leadership through Physical Activity and Sports; Introduction to First Aid. | R1,R2 | |
| 5 | 24-28 | Himachal Pradesh: A Basic Information | History, Culture, Heritage/ Tradition, Customs & Manners. Regional Knowledge, Geographical Features, Constitutional History. Tourism Place & Scope. Festivals and Fairs | R1,R2 | |

REFERENCE RESOURCES

R1- Cultural Heritage of India-Course Material by V. SivaramakrishnaBharatiya, VidyaBhavan, Mumbai, 5th Edition, 2014

R2- Himachal Pradesh History, Culture & Economy by MianGoverdhan Singh & Prof. Dr. C.L. Gupta


Signature of Teacher with Date 27/01/26


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Govt. Polytechnic Hamirpur (H.P.)
Practical Planning & Coverage

Branch : Electrical Engg. Semester: 4th

Subject : FPE Lab Session : Jan-May 2026

Teacher: Anil Kumar

| Pract. No. | Description of Practical | Reference for Procedure/ Writeup | Likely Dates | Actual Dates | Signature |
|------------|--|----------------------------------|--------------|--------------|-----------|
| 1. | Test the proper functioning of power transistor. | Lab Manuals | | | |
| 2. | Test the proper functioning of IGBT | -do- | | | |
| 3. | Test the proper functioning of DIAC to determine the break over voltage. | -do- | | | |
| 4. | Determine the latching current and holding current using V-I characteristics of SCR. | -do- | | | |
| 5. | Test the variation of R, C in R and RC triggering circuits on firing angle of SCR. | -do- | | | |
| 6. | Test the effect of variation of R, C in UJT triggering technique. | -do- | | | |
| 7. | Perform the operation of Class – A, B, C, turn off circuits. | -do- | | | |
| 8. | Perform the operation of Class –D, E, F turn off circuits. | -do- | | | |
| 9. | Use CRO to observe the output waveform of half wave controlled rectifier with resistive load and determine the load voltage. | -do- | | | |
| 10. | Draw the output waveform of Full wave controlled rectifier with R load, RL load, free-wheeling diode and determine the load voltage. | -do- | | | |
| 11. | Determine the firing angle using DIAC and TRIAC phase controlled circuit on output power under different loads such as lamp, motor or heater | -do- | | | |
| 12. | Simulate above firing angle control on SCILAB software | -do- | | | |
| 13. | Test the performance of given SMPS, UPS. | -do- | | | |
| 14. | Troubleshoot the Burglar's alarm, Emergency light system, Speed control system, Temperature control system. | | | | |


Signature of Teacher


Signature of HOD

**Govt. Polytechnic Hamirpur
Practical Planning & Coverage**

Branch : **Electrical Engg.**

Subject : **ELECTRICAL ESTIMATING AND CONTRACTING**

Teacher : **Parveen Dogra**

Semester: **4th**

Session: **Jan- May 26**

Lab Name :

| Practical No. | Description of Practical | Reference for Procedure/ Writeup | Likely Dates | Actual Dates | Sign |
|---------------|---|----------------------------------|--|--------------|------|
| 1 | Prepare a tender notice for purchasing a transformer of 200 KVA for commercial installation. | Lab Manual | G ₁ 30.1.26 G ₂ 29.1.26 | | |
| 2. | Prepare a quotation for purchasing different electrical material required. | Lab Manual | G ₁ 6.2.26 G ₂ 5.2.26 | | |
| 3. | Prepare a comparative statement for above material Prepare purchase order for the same | Lab Manual | G ₁ 13.2.26 G ₂ 12.2.26 | | |
| 4. | Design drawing, estimating and costing of hall / Cinema Theater / commercial installation Prepare report and draw sheet. | Lab Manual | G ₁ 20.2.26 G ₂ 19.2.26 | | |
| 5 | Design electrical installation scheme for any one factory /small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet. | Lab Manual | G ₁ 27.2.26 G ₂ 26.2.26 | | |
| 6 | Estimate with a proposal of the electrical Installation of street light scheme for small premises after designing. | Lab Manual | G ₁ 6.3.26 G ₂ 5.3.26 | | |
| 7 | Estimate with a proposal of the L.T. line installation. Prepare report and draw sheet. | Lab Manual | G ₁ 13.3.26 G ₂ 12.3.26 | | |
| 8 | Estimate with a proposal of the 500 KVA, 11/0.433 KV outdoor substation and prepare a report | Lab Manual | G ₁ 20.3.26 G ₂ 19.3.26 | | |

Parveen
27.01.26
Signature of Teacher with Date

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Signature of HOD (EE)

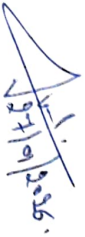
Lesson Planning (Theory)

| GP | | Department: Electrical Engg. | | Subject: Fundamental of Power Electronics | | |
|--------------------------|------------|---|--|--|--|---------|
| Hamirpur | | Sem. & Branch:4th& Elect. Engg | | Session:- Jan-/May 2026 | | |
| SYLLABUS COVERAGE | | Total Periods: Theory:56 | | | | |
| Sr No | Period Nos | Topic | Details | Instruction Reference | Additional Study Recommended | Remarks |
| 1 | 10(1-10) | Unit – I Power Electronic Devices | <p>Power electronic devices</p> <p>Power transistor: construction, working principle, V-I characteristics and uses. IGBT: Construction, working principle, V-I characteristics and uses.</p> <p>Concept of single electron transistor (SET) - aspects of Nano-technology.</p> | R1, R2 | Internet | |
| 2 | 12(11-22) | Unit – II Thyristor Family Devices | <p>SCR: construction, two transistor analogy, types, working and characteristics. SCR mounting and cooling. Types of Thyristors: SCR, LASCR, SCS, GTO, UJT, PUT, DIAC and TRIAC</p> <p>Thyristor family devices: symbol, construction, operating principle and V-I characteristics. Protection circuits: over-voltage, over-current, Snubber, Crowbar</p> | R3, R2, R1 | Internet, Power Eltx. By P.S. Bhimbra | |
| 3 | 12(23-34) | Unit– III Turn-on and Turn-off Methods of Thyristors | <p>SCR Turn-On methods: High Voltage thermal triggering, Illumination triggering, dv/dt triggering, Gate triggering.</p> <p>Gate trigger circuits – Resistance and Resistance-Capacitance circuits.</p> <p>SCR triggering using UJT, PUT: Relaxation Oscillator and Synchronized UJT circuit. Pulse transformer and opto-coupler based triggering.</p> <p>SCR Turn-Off methods: Class A- Series resonant commutation circuit, Class B-Shunt Resonant commutation circuit, Class C-Complimentary Symmetry commutation circuit, Class D –Auxiliary commutation, Class E- External pulse commutation,</p> | R3, R4, R5 | Internet, Power Eltx. By P.S. Bhimbra | |

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|---|------------|--------------------------------------|--|------------|---------------------------------------|--|
| 4 | 12(35-46) | Unit- IV Phase Controlled Rectifiers | Class F- Line or natural commutation. Phase control: firing angle, conduction angle. Single phase half controlled, full controlled and midpoint controlled rectifier with R, RL load: Circuit diagram, working, input- output waveforms, equations for DC output and effect of freewheeling diode. Different configurations of bridge controlled rectifiers: Full bridge, half bridge with common anode, common cathode, SCRs in one arm and diodes in another arm. | R4, R5, R3 | Internet, Power Eltx. By P.S. Bhimbra | |
| 5 | 10 (47-56) | Unit- V Industrial Control Circuits | Applications: Burglar's alarm system, Battery charger using SCR, Emergency light system, Temperature controller using SCR and; Illumination control / fan speed control TRIAC, SMPS. UPS: Offline and Online SCR based AC and DC circuit breakers. | R3, R5 | Internet, PowerEltx. By P.S. Bhimbra | |

References :-

- R1.** Ramamoorthy M., An Introduction to Thyristors and their applications, East-West Press Pvt. Ltd., New Delhi, ISBN: 8185336679.
- R2.** Sugandhi, Rajendra Kumar and Sugandhi, Krishna Kumar, Thyristors: Theory and Applications, New Age
- Bhattacharya, S.K.,** Fundamentals of Power Electronics, Vikas Publishing House Pvt. Ltd. Noida. ISBN: 978- 8125918530.
- R3.** Jain & Alok . Power Electronics and its Applications, Penram International Publishing (India) Pvt. Ltd, Mumbai, ISBN: 978-8187972228.
- R4.** Rashid . Muhammad, Power Electronics Circuits Devices and Applications, Pearson Education India, Noida, ISBN: 978-0133125900.
- R5.** Singh, M. D. and Khanchandani, K.B., Power Electronics, Tata McGraw Hill Publishing Co. Ltd, New Delhi, 2008 ISBN: 9780070583894.



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