Revised Syllabus (Effective from the session 2020-21)
Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Electrical Engineering

BEE-C 410

ELECTRICAL MACHINES –II

Sessional : 30
ESE : 70

MM : 100
Time : 3 Hr
L T P
3 0 0
Credits 3

NOTE: The question paper shall consist of two sections (Sec.-A and Sec.-B). Sec.-A shall contain ten questions of six marks each and student shall be required to attempt five questions Sec.-B shall contain eight descriptive type questions of ten marks each and students shall be required to attempt any four questions. Question shall be uniformly distributed from the entire syllabus. The previous year paper /model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Synchronous Machine-Generator: Constructional features, Armature winding, EMF Equation, Winding coefficients, equivalent circuit and phasor diagram, Armature reaction, O. C. & S. C. tests, Voltage Regulation using Synchronous Impedance Method, MMF Method, Potier's Triangle Method, Parallel Operation of synchronous generators, operation on infinite bus, synchronizing power and torque co-efficient.

UNIT II

Synchronous Machine-Motor: Two Reaction Theory, Power flow equations of cylindrical and salient pole machines, operating characteristics, Starting methods, Effect of varying field current at different loads, V- Curves, Hunting & damping, synchronous condenser.

UNIT III

Three phase Induction Machine – I: Constructional features, Rotating magnetic field, Principle of operation, Phasor diagram, equivalent circuit, torque and power equations, Torque- slip characteristics, no load & blocked rotor tests, efficiency, Induction generator.

UNIT IV

Three phase Induction Machine- II: Starting, speed control (with and without emf injection in rotor circuit), Deep bar and double cage rotors, Cogging & Crawling,

UNIT V

Single phase Induction Motor: Double revolving field theory, Equivalent circuit, No load and blocked rotor tests, Starting methods, repulsion motor.
AC Commutator Motors: Universal motor, Single-phase a.c. series compensated motor, stepper motors.

Text Books
1. D.P.Kothari & I.J. Nagrath, Electric Machines, Tata Mc Graw Hill.
2. P.S. Bimbhra Generalized Theory of Electrical Machines, Khanna Publishers.
3. Fitzerald, A.E., Kingsley and S.D.Umans, Electric Machinery, MC Graw Hill.

Reference Books
1. P.S. Bimbhra, Electrical Machines, Khanna Publisher.
2. M. G. Say, Alternating Current Machines, Pitman & Sons.
3. O.C. Taylor, The performance & design of A.C. Commutator Motors, A.H. Wheeler & Co(P) Ltd.

Revised Syllabus (Effective from the session 2020-21)
Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Electrical Engineering

BEE-C 411
POWER ELECTRONICS

Sessional : 30
ESE : 70

MM : 100
Time : 3 Hr
L T P
3 0 0
Credits 3

NOTE: The question paper shall consist of two sections (Sec.-A and Sec.-B). Sec.-A shall contain ten questions of six marks each and student shall be required to attempt five questions, Sec.-B shall contain eight descriptive type questions of ten marks each and students shall be required to attempt any four questions. Question shall be uniformly distributed from the entire syllabus. The previous year paper /model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Power Semiconductor Devices: Power semiconductor devices their symbols and static characteristics and specifications of switches, types of power electronic circuits BJTO operation steady state and switch characteristics, switching limits Operation and steady state characteristics of IGBT Thyristor – Operation V- I characteristics, two transistor model, methods of turn-on Operation of GTO, MCT and TRIAC, Protection of devices, Series and parallel operation of thyristors Commutation techniques of thyristor.

UNIT II

DC-DC Converters: Principles of step-down chopper, step down chopper with R-L Load Principle of step-up chopper, and operation with RL load, classification of choppers.
Phase Controlled Converters: Single phase half wave controlled rectifier with resistive and inductive loads, effect of freewheeling diode. Single phase fully controlled and half controlled bridge converters.

UNIT III

Three Phase Converters: Performance Parameters Three phase half wave converters Three phase fully controlled and half controlled bridge converters, Effect of source and load impedance, Single phase and three phase dual converters.

UNIT IV

AC Voltage Controllers: Principle of On-Off and phase controls Single phase ac voltage controller with resistive and inductive loads Three phase ac voltage controllers (various configurations and comparison) Single phase transformer tap changer. Cyclo Converters Basic

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principle of operation, single phase to single phase, three phase to single phase and three phase to three phase cyclo converters, output voltage equation.

UNIT V

Inverters: Single phase series resonant inverter Single phase bridge inverters Three phase bridge inverters Voltage control of inverters Harmonics reduction techniques Single phase and three phase current source inverters.

Text Books
1. M.H. Rashid, Power Electronics: Circuits, Devices & Applications, Prentice Hall of India Ltd. 3rd Edition, 2004.
2. M.D. Singh and K.B. Khanchandani, Power Electronics, Tata MC Graw Hill, 2005

Reference Books
1. M.S. Jamil Asghar, Power Electronics, Prentice Hall of India Ltd., 2004
2. A. Chakrabarti, Rai & Co., Fundamentals of Power Electronics &Drives, Chanpat Rai &Co.
3. K. Hari Babu, Power Electronics, Switch Publications.

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Electrical Engineering

BEE-C 412
ELECTRICAL MEASUREMENT AND MEASURING INSTRUMENTS

MM : 100   Sessional : 30
Time : 3 Hr   ESE : 70
L T P
3 0 0
Credits 3

NOTE: The question paper shall consist of two sections (Sec.-A and Sec.-B). Sec.-A shall contain ten questions of six marks each and student shall be required to attempt five questions Sec.-B shall contain eight descriptive type questions of ten marks each and students shall be required to attempt any four questions. Question shall be uniformly distributed from the entire syllabus. The previous year paper /model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Philosophy Of Measurement: Methods of Measurement, Measurement System, Classification of instrument systems , Characteristic of instrument & measurement system, Errors in Measurement & its Analysis , Standards .

Analog Measurement of Electrical Quantities: Electrodynamics ,Thermocouple Electrostatic & rectifier type Ammeters & Voltmeters , Electrodynamics Wattmeter, Three Phase Wattmeter, Power in three Phase System , Errors & remedies in Wattmeter and energy meter.

UNIT II

Instrument Transformer (CT and PT), and their application in the extension of instrument range, Introduction to measurement of speed, Frequency and Power factor, Vibration etc.

UNIT- III

Measurement of Parameter: Different methods of measuring low, medium and high resistances, Measurement of Inductance & Capacitance with the help of AC Bridges, Q Meter.

UNIT- IV

AC Potentiometer: Polar type & Co-ordinate type AC potentiometer, Application of AC Potentiometers in Electrical measurement.

Magnetic Measurement: Ballistic Galvanometer, Flux meter, Determination of Hysteresis loop Measurement of iron losses.

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UNIT- V

Digital Measurement of Electrical Quantities: Concept of digital Measurement, Block Diagram Study of digital voltmeter, frequency meter power analyzer and harmonics analyzer; Electronic Multimeter.

Cathode Ray Oscilloscope :Electronic multimeter , Power Analyzer, Harmonics analyzer, , Electronic multimeter , Power Analyzer, Harmonics analyzer , Basic CRO circuit (Block Diagram),Cathode ray tube (CRT) & its component , Application of CRO in measurement ,Lissajous Pattern., Dual trace & dual beam Oscilloscope.

Text Books

1. E.W. Golding & F.C. Widdis, Electrical Measurement &Measuring Instrument , A.W. Wheeler& Co. Pvt. Ltd. India .
2. A.K. Sawhney, Electrical & Electronic Measurement & Instrument, Dhanpat Rai & Sons , India

Reference Books

1. Forest K. Harries , "Electrical Measurement " Willey Eastern Pvt. Ltd. India .
2. M.B. Stout , "Basic Electrical Measurement" Prentice hall of India ,India.
3. W. D. Cooper , "Electronic Instrument & Measurement Technique" prentice hall International.

Revised Syllabus (Effective from the session 2020-21)
Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Electrical Engineering
BEE-C 413
SIGNALS & SYSTEMS

Sessional : 30
ESE : 70

MM : 100
Time : 3 Hr
L T P
3 0 0
Credits 3

NOTE: The question paper shall consist of two sections (Sec.-A and Sec.-B). Sec.-A shall contain ten questions of six marks each and student shall be required to attempt five questions. Sec.-B shall contain eight descriptive type questions of ten marks each and students shall be required to attempt any four questions. Question shall be uniformly distributed from the entire syllabus. The previous year paper /model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I
Signals and Systems: Continuous-time and discrete-time Signals, Transformations of the Independent Variable, Exponential and Sinusoidal Signals, Continuous-Time and Discrete-Time LTI Systems and their properties, convolution sum and convolution integrals, LTI System described by differential and difference equations. **Z-Transform:** Z-Transform, Region of convergence, Inverse Z-transform, analysis and characterization of LTI system, Block diagram representation, Unilateral Z-transform.

UNIT II
Fourier Series and Fourier Transform: The response of LTI Systems to Complex Exponentials, Fourier Series Representation of Continuous-time Periodic Signals and their Properties, Continuous time and discrete time Fourier Transforms and their properties, System Characterized by Linear Constant Coefficient Differential equations and Difference equations.

UNIT III
Time and Frequency Characterization of Signals and Systems: Magnitude Phase Representation of the Fourier Transform, Magnitude Phase Representation of the Frequency response of LTI systems, Time domain Properties of Ideal Frequency Selective filter, Time Domain and Frequency Domain aspects of Non ideal filters, First Order and Second Order Continuous Time and Discrete time Systems.

UNIT IV
Sampling and Laplace Transform: Signal representation by samples, sampling theorem, Impulse train sampling, sampling of discrete time signals, discrete time processing of continuous time signals. Laplace Transform, Region of convergence, inverse Laplace Transform, Analysis and characterization of LTI System, Block diagram representation, Unilateral Laplace transform.

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UNIT V

Random variable, random process correlation functions, cumulative distribution function, probability density function, joint-cumulative distribution, probability density function. Expectation, mean, variance, covariance, auto-correlation, power spectral density, Gaussian Pdf and Raleigh Pdf.

Text Books

1. V. Oppenheim, A.S. Willsky and S. Hamid Nawab, 'signals & System', Pearson Education, Second Edition, 2003.

References

1. Roberts, "Signals and Systems" Tata McGraw Hills.
2. P. Ramesh Babu, R. Ananda Natarajan,"Signals and Systems", SCITECH Publications.
3. Charles L. Phillips, John M.PARR and EVEA. RISKIN, "Signals, Systems and Transforms", PEARSON Education, Third Edition.
4. Chen 'Signals & Systems, Oxford University, Press.

BET-C306/BET-C414

Effective from the session 2020-21
BET-C306/BET-C414
DIGITAL SYSTEM DESIGN

MM : 100
Time : 3 hrs
L T P
3 0 0

Sessional : 30
ESE : 70
Credit : 3

NOTE: The question paper shall consist of two sections (Sec.-A and Sec.-B). Sec.-A shall contain ten questions of six marks each and student shall be required to attempt five questions Sec.-B shall contain eight descriptive type questions of ten marks each and students shall be required to attempt any four questions. Question shall be uniformly distributed from the entire syllabus. The previous year paper /model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Number System: Representation of negative numbers, 9's and 1's complement, 10's and 2's complement, arithmetic using 2's complement. BCD Code, Gray Code, Excess-3 Code, Introduction to Boolean algebra, Truth table verification of various gates, Realization of Switching functions with gates.
K- Map: Representation up to 4 variables, simplification and realization of various functions using gates. Tabular Method, Combinational logic and design procedure.

UNIT II

Combinational logic Circuits: Arithmetic circuits, Half and Full adder, Subtractors, BCD adders, Code Conversion, 4 bit Magnitude Comparator (IC -7485), Cascading of IC 7485, Decoder, Multiplexer, Demultiplexers, Encoders. Parallel Binary adder, IC 7483, 4-bit Binary parallel adder/subtractor.

UNIT III

Sequential Logic Circuits: Flip Flops, S-R latch, gated latches, Edge triggered Flip Flops, Master-slave Flip Flops, Conversion of flip flops, Analysis of clocked sequential circuits, Design of synchronous circuits, State transition diagram, state reduction and assignment.

UNIT IV

Counters: Design of Asynchronous and Synchronous Counters, Two bits & four bits up & down counters and their design, Shift registers, Serial & Parallel data transfer, Shift left/Right register, Shift Register applications.

UNIT V

Logic Families: Diode switching, Transistors as a switching element, MOS as a digital circuit element, concept of transfer characteristics, input characteristics and output characteristics of logic gates, fan in, fan out, noise margin, Logic families: TTL, IIL, ECL, NMOS, & CMOS, Open collector outputs.

Reference
1. M.Morris Mano, Digital Design, PHI
2. R.P.Jain, Modern Digital electronics, TMH
3. A.Anand Kumar, Fundamentals of Digital Circuits, PHI
4. Lee S.C, Modern Switching Theory and Digital design, PHI
5. Greenfield J.D., Practical Digital design using ICs, John Wiley.

Faculty of Engineering & Technology, GKV, Haridwar

Electronics & Communication Engineering

Course outcomes:

At the end of this course)students will demonstrate the ability to

1. Design and analyze combinational logic circuits
2. Design & analyze modular combinational circuits with MUX/DEMUX, Decoder, Encoder
3. Design & analyze synchronous sequential logic circuits

समस्त स्नातक स्तर की कक्षाओं हेतु
अनिवार्य पाठ्यक्रम
तृतीय / चतुर्थ सत्र **Semester III/IV**

समय (Time) – 0.3 घंटे (Hours)
पूर्णांक -100
सत्रान्तपरीक्षा -70
आन्तरिकपरीक्षा – 30
Credit- 0

BKT-A403

BKT-A301-A401 भारतीय ज्ञानपरम्परा
Bharteeya Jnanaparampara

BKT-A403

प्रस्तावित पाठ्यक्रम (Prescribed Course)

घटक-1

1 वैदिक एवं लौकिक साहित्य का परिचय एवं उसका उद्देश्य (वैदिक साहित्य, आर्ष साहित्य एवं स्मृति साहित्य)

2 वैदिक प्रार्थनाएं गायत्री, भद्रप्राप्ति, शान्ति, संगठन, सोमनस्य एवं पञ्च महायज्ञ का सामान्य परिचय

3 ब्रह्मचर्य महिमा, वैदिक राष्ट्रभक्ति एवं शिवसंकल्प (ब्रह्मचर्य सूक्त - अथर्व0 11.5, पृथिवी सूक्त -
   अथर्व0 12.1, शिवसंकल्प सूक्त - यजुर्वेद 34.1-6 में वर्णित विषयवस्तु के आधार पर)

घटक-2

1 वैदिक कालीन सामाजिक एवं शिक्षा व्यवस्था

2 संस्कारों की जीवन में उपयोगिता

3 पुरुषार्थ चतुष्टय – धर्म, अर्थ, काम, मोक्ष

घटक-3

1 त्रैतवाद ईश्वर, जीव एवं प्रकृति का स्वरूप

2 कर्म एवं पुनर्जन्म सिद्धान्त (कर्म- निष्काम कर्मयोग एवं कर्मफल सिद्धान्त)

घटक-4

1 मानव जीवन के विकास में योग की महत्ता

2 अष्टांग योग- यम, नियम, आसन, प्राणायाम, प्रत्याहार, धारणा, ध्यान, समाधि

घटक-5

1 भारतीय संस्कृति एवं सभ्यता : एक परिचय

2 महर्षि दयानन्द एवं स्वामी श्रद्धानन्द का व्यक्तित्व एवं कृतित्व

3 आर्य समाज की स्थापना, उद्देश्य एवं कार्य (सामाजिक जनजागरण, अछूतोद्धार, महिला शिक्षा, शुद्धि आन्दोलन, सामाजिक कुरीतियों
   का उन्मूलन, स्वतन्त्रता संग्राम में योगदान)

सहायक पुस्तकें –

1 वैदिक साहित्य एवं संस्कृति, डॉ0 कपिल देव द्विवेदी।

2 उपनिषद् दीपिका, डॉ0 गंगानाथ वेदालंकार।

3 वैदिकदर्शन, डॉ0 कपिल देव द्विवेदी, विश्वविद्यालय प्रकाशन, वाराणसी

4 प्राचीन भारत तथा सामाजिक एवं आर्थिक इतिहास, डॉ0 देवेन्द्र गुप्ता, भारतीय बुक कॉर्पोरेशन, नई दिल्ली।

5 योगदर्शन, स्वामी रामदेव, पतञ्जलि योगपीठ, हरिद्वार।

6 सत्यार्थ प्रकाश, स्वामी दयानन्द।

7 आर्यसमाज का इतिहास, डॉ0 सत्यकेतु विद्यालंकार।

8 भारतीय नवजागरण के पुरोधा, डॉ0 भवानी लाल भारतीय

9 संस्कृत साहित्य का इतिहास, डॉ0 कपिल देव द्विवेदी, विश्वविद्यालय प्रकाशन, वाराणसी

Revised Syllabus (Effective from the session 2020-21)

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Electrical Engineering

BEE-C 461

ELECTRICAL MACHINES-II LAB

MM : 50
Time : 2 Hr
L T P
0 0 2
Credits 1

Sessional : 15
ESE : 35

LIST OF EXPERIMENTS

1. To perform no load and blocked rotor tests on a three phase squirrel cage induction motor and determine equivalent circuit.

2. To perform load test on a three phase induction motor and draw:
(i) Torque -speed characteristics
(ii) Power factor-line current characteristics

3. To perform no load and blocked rotor tests on a single phase induction motor and determine equivalent circuit.

4. To study speed control of three phase slip ring induction motor by varying rotor resistance.

5. To perform open circuit and short circuit tests on a three phase alternator and determine voltage regulation at full load and at unity, 0.8 lagging and leading power factors by (i) EMF method (ii) MMF method.

6. To determine V-curves and inverted V-curves of a three phase synchronous motor.

7. To determine X_d and X_q of a three phase salient pole synchronous machine using the slip test.

8. To study the synchronization of an alternator with bus bars.

NOTE

1. In practical examination the student shall be required to perform one experiment.

2. A teacher shall be assigned 20 students for daily practical work in laboratory.

3. No batch for practical class shall consist of more than 20 students.

4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.

5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Faculty of Engineering and Technology, GKV, Haridwar

Department of Electrical Engineering

Revised Syllabus (Effective from the session 2020-21)
Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Electrical Engineering

BEE-C 462

POWER ELECTRONICS LAB

Sessional : 15
ESE : 35

MM : 50
Time : 2 Hr
L T P
0 0 2
Credits 1

LIST OF EXPERIMENTS

1. To study the DC voltage trigger with superimposed AC (SCR triggering circuit)
2. SCR trigger by R and R-C phase shift circuit.
3. To study the SCR phase control circuit.
4. To study the Triac phase control circuit.
5. To study the voltage commutated DC Chopper.
6. To study the current commutated DC Chopper.
7. To study the IGBT single-phase Inverter.
8. To study MOSFET single-phase Inverter.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

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Revised Syllabus (Effective from the session 2020-21)

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Electrical Engineering

BEE-C 463

ELECTRICAL MEASUREMENT AND MEASURING INSTRUMENTS LAB

MM : 50
Time : 2Hr
L T P
0 0 2
Credits 1

Sessional : 15
ESE : 35

LIST OF EXPERIMENTS

1. Calibration of A.C. voltmeter and A.C. ammeter.
2. Measurement of low resistance by Kelvin's double bridge.
3. Measurement of voltage, current and resistance using D.C. potentiometer.
4. Measurement of inductance by Maxwell's bridge.
5. Measurement of inductance by Hay's bridge.
6. Measurement of inductance by Anderson's bridge.
7. Measurement of capacitance by Owen's bridge.
8. Measurement of capacitance by De Sauty bridge.
9. Measurement of capacitance by Schering bridge.
10. Measurement of power and power factor of a single-phase inductive load and to study effect of capacitance connected across the load on the power factor.
11. Measurement of power and power factor of a three-phase load.
12. Measurement of phase difference and frequency of a sinusoidal A.C. voltage using C.R.O.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Faculty of Engineering and Technology, GKV, Haridwar

Department of Electrical Engineering

Effective from the session 2020-21
BET-C355/BET-C464
DIGITAL SYSTEM DESIGN LAB

Sessional : 15
ESE : 35
Credit : 1

MM : 50
Time : 2Hr
L   T   P
0   0   2

LIST OF EXPERIMENTS :

1. To verify the truth tables of various types of gates using IC 7400.
2. To verify the truth tables of Multiplexer & also implement a function using Multiplexer.
3. To design & verify the truth table of half & full adder.
4. To design & verify the truth table SR flip-flop using NOR/NAND gates.
5. To design & verify the truth table JK flip-flop using NOR/NAND gates.
6. To design & study Counters.
7. To design & study Shift registers.
8. To verify the truth tables of de Multiplexer.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.