RGPV(DiplomaWing)Bhopal	SEMESTERTEACHINGLEARNING&ASSESSMENTPLAN	FORMAT-6

NAMEOF PROGRAMME	THREEYEARSDIPLOMA	SCHEME	OBE	IMPLEMENTINGYEAR	2020-21

BRANCHCODE	*E05*	NAMEOF BRANCH	*ELECTRICALANDELECTRONICSENGINEERING*	SEMESTER	*FOURTH*

S. No	COURSEDETAILS					T-LPLAN		ASSESSMENTPLAN								
	COURSE CODE	COURSE NAME	PAPER CODE	No. of COs	No. of LOs	Total T-L Hrs.	T-L Hrs. /Week	Internal Assessment		ExternalAssessment(UniversityExam)						Grand Total of Marks
										TheoryPaper			PracticalExam*			
								No. of LOs (C+P)#	Total Marks	No. of LOs	Total Marks	Duration in Hrs	No.of LOs	Total Marks	Duration in Hrs	
1	401	RotatingAC Machines	6844	05	15	120	08	04+02	30 +20	07	70	03:00	02	30	03:00	150
2	402	Generation,Transmission & Distribution (GTD)	6845	05	15	120	08	04+02	30 +20	07	70	03:00	02	30	03:00	150
3	403	LinearIntegrated Circuits	6860	05	15	105	07	03+02	30+20	07	70	03:00	03	30	03:00	150
4	404	Microprocessor, Microcontroller and Peripheral Devices	6861	05	15	90	06	03+02	30+20	07	70	03:00	03	30	03:00	150
5	405	Professional Development-IV				60	04		75							75
TOTAL																
No.ofTheoryPapers										04			No.ofPracticalExams			04

**ExamforLOs(Psycho+ Affect.)#(C+P) =cognitive+ Psychomotor*

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 1 / 5

Branch	Electrical & Electronics Engineering	Semester	4
Course Code	401	Paper code	Subject: Rotating AC Machines

Course Outcome 1	Estimate the performance of three phase induction motor.	Teach Hrs	Marks
Learning Outcome E0540111	Explain constructional features and working of three phase induction motor. (Cognitive domain)	6	8
Contents	• Concept of rotating magnetic field • Construction: parts, materials and their functions • Types of three phase induction motor • Working principle of three phase induction motor • Concept of slip and rotor frequency		
Method of Assessment	*Internal : Mid Semester Test 1 – Pen Paper test and Assignment*		
Learning Outcome E0540112	Analyze performance of three phase induction motor. (Cognitive domain)	10	12
Contents	• Comparison of three phase induction motor with transformer • Equivalent circuit of three phase induction motor • Power stages in three phase induction motor • Torque equation and torque – slip / speed characteristics • Condition for maximum torque under starting and running condition • Methods of braking • Methods of speed control : (i) Rotor resistance control (ii) Voltage control (iii) V / f control • Applications of three phase induction motor		
Method of Assessment	*External: End Semester Theory Exam – Pen Paper test.*		
Learning Outcome E0540113	Calculate losses and efficiency of three phase induction motor.	2+4	8

	(Cognitive domain)		
Contents	• **Losses and efficiency of three phase induction motor** • **Numericals**		
Method of Assessment	***External: End Semester Theory Exam – Pen Paper test.***		
Learning Outcome E0540114	**Demonstrate starters and conduct various tests on three phase induction motor.** **(Psychomotor and affective domain)**	**10**	**12**
Contents	• **DOL, Star / Delta and Rotor resistance starters** • **Perform No -load test and Block rotor test on three phase induction motor**		
Method of Assessment	***External: End semester practical Exam-Performance of Task & viva voce***		
Course Outcome-2	**Select appropriate single phase motor for given applications.**		
Learning Outcome E0540125	**Explain working principle and starting methods of single phase induction motor.** **(Cognitive domain)**	**6**	**8**
Contents	• Double revolving field theory • Methods of making single phase induction motor self starting • Torque – slip characteristic of single phase induction motor • Classification of single phase induction motors • Split phase motor – Resistance start motor, Capacitor start motor, Capacitor start & run motor • Shaded pole motor		
Method of Assessment	***External: End Semester Theory Exam – Pen Paper test***		
Learning Outcome E0540126	**Select single phase motors for various applications.** **(Cognitive domain)**	**6**	**7**
Contents	• Working principle and applications of : (i) Reluctance Motor (ii) Hysteresis Motor (iii) Universal Motor (iv) AC Series Motor		
Method of Assessment	***Internal: Mid Semester Test -1– Pen paper test & Assignment***		

Learning Outcome E0540127	**Demonstrate single phase induction motors and Universal motor. (Psychomotor & affective domain)**	**8**	**10**
Contents	• Single phase induction motors • Universal motor		
Method of Assessment	**Internal: performance of task, observation & viva voce**		
Course Outcome 3	**Recommend special purpose machine for specific applications.**		
Learning Outcome E0540138	**Describe constructional features of various special purpose machines. (cognitive domain)**	**8**	**10**
Contents	• Stepper Motor – Permanent magnet type & Variable reluctance type • Switched Reluctance Motor (SRM) • Linear Induction Motor (LIM) • Permanent Magnet Synchronous Motor (PMSM) and Permanent Magnet DC (PMDC) motor • Induction Generator		
Method of Assessment	***External: End Semester Theory Exam – Pen Paper test.***		
Learning Outcome E0540139	**Choose appropriate machines for specific applications. (cognitive domain)**	**6**	**7**
Contents	• Stepper Motor – Permanent magnet type & Variable reluctance type • Switched Reluctance Motor (SRM) • Linear Induction Motor (LIM) • Permanent Magnet Synchronous Motor (PMSM) and Permanent Magnet DC (PMDC) motor • Induction Generator		
Method of Assessment	***Internal: Mid Semester Test-2 – Pen paper test & Assignment***		
Course Outcome- 4	**Analyze the performance of synchronous motor.**		
Learning Outcome E05401410	**Explain constructional features and working of synchronous motor. (Cognitive domain)**	**6**	**8**
Contents	• **Construction of synchronous machine and types of rotor** • **Working principle of synchronous motor and methods of starting** • **Hunting and its prevention** • **Comparison of synchronous motor with induction motor**		
Method of Assessment	***Internal: Mid Semester Test -2– Pen paper test & Assignment***		

Learning Outcome E05401411	**Analyze the effect of change in excitation on the performance of synchronous motor. (Cognitive domain)**	**6**	**8**
Contents	• **Phasor diagram** • **Effect of change in excitation**		
Method of Assessment	***External: End Semester Theory Exam – Pen Paper test.***		
Learning Outcome E05401412	**Draw V curves and inverted V curves of synchronous motor and discuss. (Psychomotor & affective domain)**	**8**	**10**
Contents	• **Plot V curves of synchronous motor** • **Plot inverted V curves of synchronous motor**		
Method of Assessment	**Internal: performance of task, observation & viva voce**		
Course Outcome- 5	**Evaluate the performance and demonstrate the characteristics of synchronous generator.**		
Learning Outcome E05401513	**Discuss working principle and related concepts of synchronous generator. (Cognitive domain)**	**12**	**14**
Contents	• **Working principle of synchronous generator** • **Advantages of stationary armature and rotating field** • **Speed-frequency relationship** • **Pitch factor, Distribution factor and Winding factor** • **EMF equation of synchronous generator** • **Brief idea of excitation system** • **Factors affecting the terminal voltage of alternator** • **Concept of synchronous impendence** • **Cooling methods of synchronous generator**		
Method of Assessment	***External: End Semester Theory Exam – Pen Paper test.***		
Learning Outcome E05401514	**Analyze performance of synchronous generator and solve numerical problems. (Cognitive Domain)**	**4+4**	**10**
Contents	• **Equivalent circuit** • **Phasor diagram** • **Regulation by EMF method** • **Parallel operation: conditions and advantages** • **Numericals on generated EMF and voltage regulation**		
Method of Assessment	***External: End Semester Theory Exam – Pen Paper test.***		

Learning Outcome **E05401515**	**Conduct various tests on synchronous generator. (Psychomotor & affective domain)**	**14**	**18**
Contents	• Plot OC and SC characteristics • Perform synchronization of synchronous generator by Lamp method and synchroscope		
Method of Assessment	***External: End semester practical Exam-Performance of Task & viva voce***		

Reference Books:

1. Dr. S. K. Sahdev, Electrical Machines, Cambridge University Press.
ISBN:9781108431064
2. Bhattacharya S. K. Electrical Machines, McGraw Hill Education, New Delhi,
ISBN:9789332902855
3. Theraja B. L., Electrical Technology Vol – II (AC and DC Machines), S. Chand and Co. Ltd., New Delhi,
ISBN: 9788121924375
4. Ashfaq Husain: Electric Machines, Dhanpat rai and Co.
ISBN:978-81-7700-166-2

5.P. S. Bimbhra, Electrical Machines Vol – I & II, Khanna Book Publishing House.
ISBN: 978-9386173-447,978-93-86173-607

6.Mehta V. K. and Mehta Rohit, Principle of Electrical Machines, S. Chand and Co. Ltd.,New Delhi.
ISBN: 9788121930888

7.Kothari D. P. and Nagrath I. J., Electrical Machines, McGraw Hill Education New Delhi.
ISBN:9780070593572, 9780070699670.

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 1/5

Branch	Electrical & Electronics Engineering	Semester	4
Course Code	402	Course Name	Generation, Transmission & Distribution

Course Outcome 1	Comprehend conventional and non-conventional sources of Energy.	Teach Hrs	Marks
Learning Outcome E0540211	**Describe various sources of Energy. [Cognitive Domain]**	08	10
Contents	➢ Classification of energy sources: Renewable and non-renewable, Conventional and non-conventional, Commercial and non commercial. ➢ Constructional features, operating principle and working of wind, solar, geo-thermal, fuel-cell, bio-gas, MHD and tidal power plants.		
Method of Assessment	Internal: Mid semester-I theory examination (Pen paper test)		
Learning Outcome E0540212	**Elaborate the concept of conventional power plants. [Cognitive Domain]**	08	10
Contents	➢ Schematic diagram of Thermal, Hydro, Nuclear and Diesel power plants. ➢ Site selection, advantages and disadvantages of above mentioned plants. ➢ Comparative analysis of all the above mentioned plants.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome E0540213	**Connect solar panels for different output requirements. [Psychomotor domain]**	8	10
Contents	➢ To connect PV modules in series and measure resultant output (voltage & current). ➢ To connect PV modules in parallel and measure resultant output (voltage & current).		
Method of Assessment	External: Performance of given task and viva voce		
Learning Outcome E0540214	**Identify various electrical devices installed at generating station. [Affective & Psychomotor domain]**	8	10
Contents	➢ To conduct a visit of any conventional or non conventional generating station.		
Method of Assessment	Internal: Viva voce & report submission.		

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 2/5

Branch	Electrical & Electronics Engineering	Semester	4

Course Code	402	Course Name	Generation, Transmission & Distribution

Course Outcome 2	Illustrate the concept of Load, Economics of power generation and Tariff.	Teach Hrs	Marks
Learning Outcome E0540221	**Describe the concept of load and economics of power generation. [Cognitive Domain]**	12	15
Contents	➢ Types of loads: Domestic, Industrial, Commercial, Agricultural loads ➢ Technical terminology regarding load: connected load, firm power, average load, maximum demand, reserve capacity, hot reserve, cold reserve, spinning reserve, load curve, load duration curve, demand factor, load factor, diversity factor, plant capacity factor, plant use factor & Numerical problems. ➢ Various terms regarding economics of generation: interest, depreciation, fixed cost, semi fixed cost, operating cost, cost of per unit energy generation & Numerical problems.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome E0540222	**Practice modern and conventional aspects of electricity tariff. [Cognitive Domain]**	08	10
Contents	➢ Desirable characteristics of tariff for domestic, commercial and industrial applications. ➢ Types of conventional & renewable energy tariff: Block rate, Flat rate, Two part, Power factor, Time of day, Net metering tariff & Numerical problems. ➢ LV and HV tariff: Brief description only. ➢ Provision of incentives & Rebate in tariff.		
Method of Assessment	Internal: Quiz & Assignment.		
Learning Outcome E0540223	**Execute load survey for different analysis. [Psychomotor Domain]**	08	10
Contents	➢ To carry out load survey and plot load curve, load duration curve of a domestic load. ➢ To carry out load survey and plot load curve, load duration curve of a commercial load. ➢ To calculate normal energy bill of a domestic consumer and verify it with original bill. ➢ To calculate net metering bill of a commercial consumer and verify it with original bill.		
Method of Assessment	Internal: Performance of given task and viva voce		

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 3/5

Branch	Electrical & Electronics Engineering	Semester	4
Course Code	402	Course Name	Generation, Transmission & Distribution

Course Outcome 3	Describe various aspects of overhead transmission lines and underground cables.	Teach Hrs	Marks
Learning Outcome E0540231	**Identify various elements while installing overhead transmission lines & underground cables. [Cognitive Domain]**	**08**	**10**
Contents	➢ Line conductor – materials, types and their trade name. ➢ Line supports – requirements, types and specification of different tower structures: RCC poles, Steel poles, Lattice steel towers. ➢ Ground clearance, Sag calculation (for level supports only), effect of ice, wind and temperature on Sag, Sag template, Stringing chart. ➢ Numerical problems on Sag. ➢ Methods of laying underground cable. ➢ Comparison between overhead transmission lines & underground cables.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome E0540232	**Carry out the study of line insulators. [Cognitive Domain]**	**08**	**10**
Contents	➢ Types of insulators and their applications. ➢ Potential distribution over a string of suspension insulator. ➢ Determination of String efficiency of a string of 3 units & Numerical problems. ➢ Methods of improving string efficiency. ➢ Testing of insulators for determining puncture strength and flashover		
Method of Assessment	Internal: Mid semester-II theory examination (Pen paper test)		

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Branch	Electrical & Electronics Engineering	Semester	4
Course Code	402	Course Name	Generation, Transmission & Distribution

Course Outcome 4	Determine Electrical performance of transmission lines.	Teach Hrs	Marks
Learning Outcome E0540241	**Explain electrical aspects of overhead transmission lines. [Cognitive Domain]**	04	05
Contents	➢ Classification of transmission lines: On the basis of voltage and line length. ➢ Introductory concept of electrical parameters R, L and C of transmission line (no derivations). ➢ Concept of high voltage DC (HVDC) transmission with the help of block diagram. ➢ Types of HVDC links: Monopolar & Bipolar. ➢ Comparison of HVDC system with HVAC		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome E0540242	**Present various phenomena associated with transmission lines. [Cognitive Domain]**	08	10
Contents	➢ Transposition, Skin effect, Ferranti effect and Proximity effect. ➢ Performance evaluation of short and medium transmission lines (π & T Model): sending end voltage, sending end current, sending end power factor, voltage regulation, transmission efficiency & Numerical problems ➢ Overview of Corona – power loss, advantages and disadvantages, methods of reducing corona in brief.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome E0540243	**Evaluate performance of transmission lines. [Psychomotor Domain]**	08	10
Contents	➢ To determine V_R, I_R, Cos φ_R , voltage regulation and transmission efficiency of short transmission line. ➢ To determine V_R, I_R, Cos φ_R , voltage regulation and transmission efficiency of medium transmission line (T Model). ➢ To determine V_R, I_R, Cos φ_R , voltage regulation and transmission efficiency of medium transmission line (π Model).		
Method of Assessment	External: Performance of given task and viva voce		

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Branch	Electrical & Electronics Engineering	Semester	4

Course Code	402	Course Name	Generation, Transmission & Distribution

Course Outcome 5	Explore AC Distribution system and Distribution sub-station.	Teach Hrs	Marks
Learning Outcome E0540251	Give details of AC distribution system. [Cognitive Domain]	12	15
Contents	➢ Characteristics of an ideal distribution system. ➢ Components – feeder, distributor and service mains. ➢ Classification on the basis of voltage (primary and secondary) and configuration (radial and ring-main). ➢ Concept of radial, ring-main and micro-grid distribution system. ➢ Voltage and current distribution in different sections of radial and ring-main distribution system. Numerical problems. ➢ Comparison of radial and ring-main distribution system.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome E0540252	Outline the overview of distribution sub-station. [Cognitive Domain]	04	05
Contents	➢ Requirement of distribution substation. ➢ Classification of Distribution substation. ➢ Site selection, advantages and disadvantages. ➢ Concept of GIS (Gas Insulated Substation): Difference with normal substation, advantages.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome E0540253	Calculate voltage and current in different sections of Distributors. [Psychomotor Domain]	08	10
Contents	➢ To determine voltage drop and current in different sections of radial distributors for concentrated loading. ➢ To determine voltage drop and current in different sections of ring-main distributors for concentrated loading.		
Method of Assessment	External: Performance of given task and viva voce.		

Reference Books:

1. Gupta, J.B. A Course in Electrical Power– S. K Kataria and Sons, New Delhi. 2014.
2. Nag. P. K. Power Plant Engineering, McGraw Hill, New Delhi, ISBN: 978-9339204044
3. Gupta, B.R., Generation of Electrical Energy, S. Chand & Co. New Delhi
4. Kothari, D.P. et al: Renewable Energy Sources and Emerging Technologies, PHI Learning, New Delhi, ISBN: -978-81-203-4470-9
5. Mehta, V.K., Principles of Power System, S. Chand and Co. New Delhi, ISBN: 9788121924962
6. Sivanagaraju S.; Satyanarayana S., Electrical Power Transmission and Distribution, Pearson Education, New Delhi, , ISBN:9788131707913
7. Uppal,S.L., A Course in Electrical Power, S.K.Khanna Publisher New Delhi, ISBN : 9788174092380
8. Kamraju, V., Electrical Power Distribution System, Tata McGraw-Hill, New Delhi, ISBN:9780070151413
9. Singh, S. N. Electric Power Generation, Transmission & Distribution, PHI Publication.
10. Wadhwa, C. L. Generation, Distribution & Utilization of Electrical Energy, New Age International Publication.
11. Leonard, L Grigsby Electric Power Generation, Transmission & Distribution, Taylor & Francis Ltd.

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 1/5

Branch	Electrical and Electronics Engineering	Semester	IV

Course Code	403	Course Name	Linear Integrated Circuits

Course Outcome 1	Describe the construction of operational amplifiers.	Teach Hrs.	Marks
Learning Outcome 1	Construct Op-Amp using basic amplifier circuits. **(Cognitive)**	7	10
Contents	Four stage Block diagram of an Operational Amplifier(Op-Amp), equivalent circuit of a typical Op-Amp (4 stages), differential and common mode of operation, concept of inverting and non-inverting input, schematic symbol and equivalent circuit of Op-Amp, Ideal Characteristics		
Method of Assessment	*Internal: Mid Semester Exam-I, Pen paper test & Assignment*		
Learning Outcome 2	Explain basic Op-Amp circuit parameters.**(Cognitive)**	8	10
Contents	IC Packages of Op-Amps,Basic Parameters of Op-Amp: Inputoffsetvoltage, Inputresistance, Common Mode Rejection Ratio (CMRR), Slew rate, Gain, Bandwidth, Op-Amp 741IC characteristics,pinoutandpowersupplyrequirements **(Cognitive)**		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 3	Measure basic characteristics of Op-Amps. **(Psychomotor)**	6	10
Contents	MeasurementofDifferentcharacteristicsofanOp-Amp Viz. Output Resistance, Input Resistance, Voltage Gain, gain-bandwidth product. (On Trainer-Kit and/or Simulation)		
Method of Assessment	*External: Laboratory observation and viva voce*		

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT- 3	Sheet No. 2/5

Branch	Electrical and Electronics Engineering	Semester	IV

Course Code	403	Course Name	Linear Integrated Circuits

Course Outcome 2	Classify different Op-Amps based circuits.	Teach Hrs.	Marks
Learning Outcome 4	Construct general Op-Amp based circuits.**(Cognitive)**	8	10
Contents	**Different Circuits of Op-Amps** Circuit diagram, working concept and formula derivation of: Inverting amplifier, non-invertingamplifier, Voltage follower, Adder and Subtractor, Differentiator, Integrator, LogarithmicamplifierandAntilogarithmicamplifier		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 5	Describe general Op-Amp based filter circuits**.** **(Cognitive)**	7	10
Contents	Op-Amp based circuit diagram, working concept and frequency response of: Active filters such aslowpass, highpass, band pass, band reject and all pass filter. Simple numerical problems on Op-amp based filter design.		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 6	Verify different Op-Amps based circuits. **(Psychomotor)**	6	10
Contents	AC/DC analysis of inverting and non-inverting amplifier, verification of voltage follower, adder and differentiatoramplifier, Verification of Op-amp low pass filter(On Trainer-Kit and/or Simulation)		
Method of Assessment	*Internal: Laboratory observation and viva voce*		

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Branch	Electrical and Electronics Engineering	Semester	IV

Course Code	403	Course Name	Linear Integrated Circuits

Course Outcome 3	ConstructOp-Amp based circuit for differentapplications.	Teach Hrs.	Marks
Learning Outcome 7	Model Op-Amp in comparator and Schmitt trigger circuits. **(Cognitive)**	7	10
Contents	Comparators:functionsof acomparator, inverting and non-inverting operation ofcomparator Schmitttrigger: inverting andnon-inverting with circuit diagram, input and output waveforms and threshold levels, hysteresisvoltage curve		
Method of Assessment	*Internal: Mid Semester Exam*-I, *Pen paper test & Assignment*		
Learning Outcome 8	Explain Op-Amp based S&H circuits, rectifiers and function generators. **(Cognitive)**	8	10
Contents	Sample andHold circuit, Half Wave PrecisionRectifier, Op-Amp based WeinBridgeOscillator, PhaseshiftOscillator, Square Wave Generator, Triangular Wave Generator		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 9	Verify different applications of Op-Amp. **(Psychomotor)**	6	10
Contents	Verification of comparator, Schmitt trigger andPhase Shift using Op-Amp, (On Trainer-Kit and/or Simulation)		
Method of Assessment	*Internal: Laboratory observation and viva voce*		

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 4/5

Branch	Electrical and Electronics Engineering	Semester	IV

Course Code	403	Course Name	Linear Integrated Circuits

Course Outcome 4	Compare voltage regulators and converters	Teach Hrs	Marks
Learning Outcome 10	Classify different voltage regulator ICs.**(Cognitive)**	7	10
Contents	Voltage regulators: Fixed voltage regulator-78XX and 79XX series ICswith typical connection diagram and working Adjustable voltage regulator – using LM317 IC with typical connection diagram and working Simple numerical problems on fixed and adjustable voltage regulators.		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 11	Describe operation of converter ICs. **(Cognitive)**	8	10
Contents	Converters: Voltage to current converter with floating load its application in low voltage DC and AC voltmeter, Diode match finder. Voltage to current converter with grounded load. Current to voltage converter and its application in digital to analog converter using IC 1408. Digital to Analog Conversion using binary weighted registers, R2R registers using Op-Amp IC 351. Analog to digital conversion using successive approximation using Op-Amp as comparator.		
Method of Assessment	*Internal: Mid Semester Exam-II, Pen paper test & Assignment*		
Learning Outcome 12	Verify the working of voltage regulatorICs. **(Psychomotor)**	6	10
Contents	Verification of 78XX, 79XX , using Op-Amp ICs (On Trainer-Kit and/or Simulation)		
Method of Assessment	*External: Laboratory observation and viva voce*		

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT- 3	Sheet No. 5/5

Branch	Electrical and Electronics Engineering	Semester	IV

Course Code	403	Course Name	Linear Integrated Circuits

Course Outcome 5	Illustrate 555 timer and PLL ICs for various applications.	Teach Hrs	Marks
Learning Outcome 13	Construct multi-vibrator circuits using 555 timer **(Cognitive)**	7	10
Contents	Functional block diagram of a timer 555 IC, Pin configuration of 555, Multi-vibrator using 555 IC: mono-stable, bi-stable and astable.		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 14	Explain working and applications of PLL. **(Cognitive)**	7	10
Contents	Phase Lock Loop (PLL) 565 IC: functional block diagram with working principle, Lock & Capture range, transfer characteristicsApplications of PLL – FM demodulation and frequency multiplier		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 15	Assemble and verify 555-timer and PLL based circuits.**(Psychomotor)**	7	10
Contents	Astable multivibrator & Sawtooth waveform generator using 555 IC. PLL 565 IC as a frequency multiplier. (On Trainer-Kit and/or Simulation Software)		
Method of Assessment	*Internal: Laboratory observation and viva voce*		

SuggestedListofExperiments:

S.N.	Experiment	CO
1.	Measurement of Different characteristics of an Op-Amp inopen loop configuration. 1.Output Resistance 2.Different Input Resistance	
2.	Measurement of Differential characteristics of an Op-Amp inopen loop configuration. 1.Voltage Gain 2.Unity Gain Bandwidth	
3.	InvertingAmplifier : 1.AC analysis 2.DC analysis 3.Unity Gain Buffer	
4.	Non –Inverting Amplifier: 1.AC analysis 2.DC analysis 3.Unity Gain Buffer	
5.	Op-Amp as: 1.Adder 2.Subtractor 3.Multiplier 4.divider	
6.	Op-Amp as : Integrator Differentiator Inverter Buffer	
7.	Op-Amp as active Filter : Low pass filter High pass filter Band pass filter	
8.	Signal Generator using Op-Amp and Timer IC) Triangular wave generator) Schmitt Trigger	
9.	Signal generator using Op-Amp and Timer IC (a) Saw tooth wave generator Ramp generation	
10.	Oscillator using Op-Amp: Wein Bridge Oscillator, R.C.Phase Shift Oscillator	
11.	Sample & hold circuit operation	
12.	Precision Rectifier using an Op-Amp and Voltage regulations.	
13.	Phase lock loop as frequency multiplier.	

14.	4 bit D/A converter addition experiments.	
15.	A/D Converter	

Twentyexperimentsinasemesterasperthediscretionofthesubjectteacher.

ReferenceBooks/WebPortals:

S.N.	Title	Author
1	Op-Amps and Linear Integrated Circuit	Ramakant A. Gayakwad PHI
2	Operational Amplifiers and Linear Integrated Circuits	by R.F. Coughlin F.F Driscall PHI.
3	Electronic Devices & Circuits	Robert boylestad Pearson
4	Integrated Circuit	K. R. Botkar Khanna Publisher
5	spoken-tutorial.org	
6.	nptel.ac.in	
7.	swayam.gov.in	

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT- 3	Sheet No. 1/5

Branch	Electrical and Electronics Engineering	Semester	4

Course Code	404	Course Name	Microprocessor, Microcontroller and Peripheral Devices

Course Outcome 1	Explain 8085 Microprocessor, its architecture and memory mapping.	Teach Hrs	Marks
Learning Outcome 1	Demonstrate the architecture of 8085 Microprocessor. **(Psychomotor)**	4	10
Contents	8085 Microprocessor: Architecture, Pin Diagram with function of each pin.		
Method of Assessment	*Internal: Laboratory observation and viva voce*		
Learning Outcome 2	Define function of various blocks, buses and cycles of 8085. **(Cognitive)**	8	10
Contents	Block Diagram and its description- Register Array, ALU, Timing and Control Signals Address, Description of Address bus, data bus and control bus. Machine cycle & BUS Timing		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 3	Compare different memory mapping techniques and interrupts of 8085.**(Cognitive)**	8	10
Contents	Memory Interfacing, IO Interfacing, Block Diagram of Memory and I/O Interfacing, 8085 Interfacing Pins. Addressing modes of 8085. Interrupts and its types. Memory Mapped I/O & I/O mapped I/O		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT- 3	Sheet No. 2/5

Branch	Electrical and Electronics Engineering	Semester	4

Course Code	404	Course Name	Microprocessor, Microcontroller and Peripheral Devices

Course Outcome 2	Identify the microcontroller 8051 and its architecture.	Teach Hrs	Marks
Learning Outcome 4	Model the architecture of Microcontroller 8051. **(Psychomotor)**	4	10
Contents	Introduction to micro- controller, Comparison between microprocessor and micro-controller, 8051 Microcontroller and its architecture, Pin diagram and its description		
Method of Assessment	*Internal: Laboratory observation and viva voce*		
Learning Outcome 5	Explain block diagram and registers of Microcontroller 8051. **(Cognitive)**	8	10
Contents	Block diagram Futures of 8051 I/O ports Pins and their functions Registers 8051 data type, On-chip ROM memory and RAM Memory organization, register banks, stack and stack pointer, SFR registers, Registers - A, B, SP, DPTR, PC and SFRs.		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 6	Describe I/O ports and Machine cycles in 8051 Microcontroller. **(Cognitive)**	5	10
Contents	I/O ports structure and operation bit address. General Format and functions of each bit of PSW SFRs, machine cycle, Time delay calculations. Machine Cycles. Calculation of Time delay for different cycles of microcontroller.		
Method of Assessment	*Internal: Mid Semester Exam-I, Pen paper test & Assignment*		

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT- 3	Sheet No. 3/5

Branch	Electrical and Electronics Engineering	Semester	4

Course Code	404	Course Name	Microprocessor, Microcontroller and Peripheral Devices

Course Outcome 3	Develop the program using Assembly Language of 8085.	Teach Hrs	Marks
Learning Outcome 7	Identify different instructions formats and sets of Microprocessor 8085. **(Cognitive)**	8	10
Contents	Instruction Format Instructions Set and their classification. Data Transfer operation		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 8	Utilize the arithmetic, logic and branch operation in programming of 8085. **(Cognitive)**	8	10
Contents	Arithmetic operation Logic operation Branch Operation Stack, Subroutine and related instruction		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 9	Execute simple programs in 8085.**(Psychomotor)**	5	10
Contents	Write assemble and execute a simple program in 8085 on Arithmetic operation Logical operation Branch Operation Stack, Subroutine and related instruction		
Method of Assessment	*External: Laboratory observation and viva voce*		

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT- 3	Sheet No. 4/5

Branch	Electrical and Electronics Engineering	Semester	4

Course Code	404	Course Name	Microprocessor, Microcontroller and Peripheral Devices

Course Outcome 4	Write and execute assembly language programs for 8051 Microcontroller.	Teach Hrs	Marks
Learning Outcome 10	Classify addressing modes and instruction set of 8051 with example**(Cognitive)**	8	10
Contents	Addressing Modes : Immediate, Register, Direct, Indirect, Indexed, Relative and bit addressing Instruction set : Data Transfer, Arithmetic, Logical, Branching, and Machine Control		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 11	Analyze particular programming concept on 8051 Microcontroller as per requirement. **(Cognitive)**	4	10
Contents	Arithmetic, logical instruction, Looping, Counting, sorting and Indexing.		
Method of Assessment	*Internal: Mid Semester Exam-I, Pen paper test & Assignment*		
Learning Outcome 12	Develop programs to perform the operations on 8051 microcontroller.**(Psychomotor)**	4	10
Contents	Programs on arithmetic and logic instructions, Looping, Counting, sorting and Indexing. Data manipulation, Masking, Stack operation.		
Method of Assessment	*External: Laboratory observation and viva voce*		

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 5/5

Branch	Electrical and Electronics Engineering	Semester	4

Course Code	404	Course Name	Microprocessor, Microcontroller and Peripheral Devices

Course Outcome 5	Describe Peripherals and its interfacing with 8085	Teach Hrs.	Marks
Learning Outcome 13	Illustrate Pin diagram and block diagram of various peripherals. **(Cognitive)**	8	10
Contents	Peripherals: PIN DIAGRAM,BLOCK DIAGRAM, INTERFACING WITH 8085 8255 programmable peripheral interface 8279 programmable key board interface 8259 programmable interrupt controllers 8257 DMA controller.		
Method of Assessment	*External : End Semester Theory Exam - Pen paper test*		
Learning Outcome 14	Demonstrate the interfacing of various peripherals with 8085. **(Cognitive)**	4	10
Contents	Interfacing of 8255, 8279, 8259 and 8257 with 8085		
Method of Assessment	*Internal: Mid Semester Exam-II, Pen paper test & Assignment*		
Learning Outcome 15	Develop assembly language program to use peripherals with 8085**.(Psychomotor)**	4	10
Contents	Develop assembly language program to use peripherals with 8085.		
Method of Assessment	*Internal: Laboratory observation and viva voce*		

Suggested List of Experiments*:

S.N.	Experiment	CO
1	Identify the components of the microprocessor 8085 trainer.	CO403.1
2	Study of Pin diagram and architecture of 8085.	CO403.1
3	Study of Pin diagram and architecture of 8051.	CO403.2
4	Develop/Execute a simple program to move data from one register to the other.	CO403.3
5	Develop/Execute program immediate data between differentregisters	CO403.3
6	Develop/Execute a programon arithmetic orperations.	CO403.3
7	Develop/Execute an Assembly language program to convertHexadecimal to ASCII code conversion.	CO403.3
8	Develop/Execute Assembly language program to check whether given no is odd or even	CO403.3
9	Develop/Execute a program to add two numbers(binary, decimal and decimal)	CO403.3
10	Develop/Execute a program to convert data from one code to another code(binary grey)	CO403.3
11	Develop/Execute an Assembly language programs based on 8 bitLogical instructions.	CO403.3
12	Develop/Execute an Assembly language program to sumintegers from 0 to 9.	CO403.3
13	Develop a programto count negative values in given block ofdata.	CO403.3
14	Develop/Execute a Subroutine to find the square of given integer.	CO403.3
15	Develop/Execute an Assembly language program to sort givenarray of ten bytes in descending order.	CO403.3
16	Write a program of 8051 in assembly language programming for addition of two 8 bit numbers.	CO403.4
17	Write a program of 8051 in assembly language programming for subtraction of two 8 bit numbers	CO403.4
18	Write a program of 8051 in assembly language programming for multiplication of two 8 bit numbers	CO403.4
19	Write a program of 8051 in assembly language programming for division of two 8 bit numbers	CO403.4
20	Write and execute on kit assembly program to interface 8255 programmable peripheralinterface.	CO403.5
21	Write and execute on kit assembly program to interface 8279 programmable key board interface.	CO403.5
22	Write and execute on kit assembly program to interface 8259 programmable interrupt controllers.	CO403.5
23	Write and execute on kit assembly program to interface 8257DMA controller.	CO403.5

*Ten experiments in a semester as per the discretion of the subject teacher.

Major Equipment/Materials:

1.	Microcontroller 8051 trainer Kit
2.	8051 Simulator software (open source)
3.	Computer System(p-IV and latestversion)

4.	Peripheral Interfacing Trainerkits
5.	8085 Microprocessor TrainingKit
6.	Interfacing Card for MicroprocessorKit
7.	Microcontroller Development Board withProgrammer
8.	Universal EmbeddedTrainer
9.	Input InterfaceModule
10	Motor DriveModule
11	Embedded Training Kit
12	ADC/DAC Module
13	Computer InterfaceModule
14	Function Generator/ PulseGenerator
15	Cathode Ray Oscilloscope(C.R.O.)
16	DisplayModule

Reference Books/Web Portals:

S.N.	Title	Author	Publication
1	THE 8051 MICROCONTROLLER AND EMBEDDED SYSTEMS Using Assembly and C	Muhammad Ali Mazidi,Janice GillispieMazidi and Rolin D McKinlay	Pearson Second edition.
2	Microcontrollers : Principles And Applications	Pal Ajit	EEE, PHI ,New Delhi,(Latest edition)
3	The 8051 Microcontrollers: Architecture, Programming and Applications	Rao Dr. K Uma	Pearson Education India, New Delhi,(Latest edition)
4	The 8051 microcontroller and embedded systems	Mazidi Ali, Muhammad Mazidi Gillispie Janice	PHI, New Delhi,(Latest edition)
5	The 8051 Microcontroller: Architecture, Programming, and Applications	Kenneth Ayala J.	Thomson Delmar learning,(latest Edition)
6	The 8051 Microcontroller,	Mackenzie	Education India, New Delhi,(Latest edition)
7	Programming and customizing the 8051 microcontroller	Predko Michael	McGraw-Hill, International edition
8	Micrprocessor architecture programming and applicationwith 8085/8080A	Ramesh S. Gaonkar	Wiley Eastern Ltd.
9	Introduction to Microprocessor	Aditya P. Mathur	McGraw-Hill Inc.,US
10	Microprocessor & Interfacing	Dougus V. Hall	Mcgraw Hill Education (India) Private Limited
11	Microprocessors & Fundamentals	B. Ram	Dhanpat Rai Publications
	nptel.ac.in		
	swayam.gov.in		

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No.
					4	0	5	1	1	4

COURSE NAME	**Professional Development- IV**
CO Description	**Student will be able to organize activities related to student chapters of professional bodies and student related academic events of the department**
LO Description	**Student will be able to organize activities related to student chapters of professional bodies**

SCHEME OF STUDY

S. No	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Planning and organizing group activities and events, deciding sub-activities, distributing responsibilities, arranging resources sub-activities, scheduling sub-activities	Traditional lecture method + Case Study	Teacher will teach students how activities are planned and organized, will discuss examples and cases. Teacher will form small student groups, guide them to plan and organize the activities assigned to their group, teacher will supervise their implementation of the activity plans and correct their mistakes , teacher will ensure their learning through organizing the related different activities	04	06	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Student activity/task	The teacher will ask the students to organize small group-activity events. Teacher will observe and assess the extent of quality of plan, implementation of plan and student's learning for organizing professional body activities	10	Rating Scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. **Suggested departmental student chapter activities:**

- **Organizing departmental chapter meetings**
- **Local community awareness programme on social issues, traffic rules, cleanliness drive, use of plastics and environmental protection etc.**
- **Poster competition on social concerns, traffic rules, cleanliness drive, use of plastics and environmental protection etc. and awarding the best prepared poster**
- **Engineering knowledge competitions**
- **Outreach workshop for local high school students**
- **Publishing institutional/departmental student chapter newsletter**
- **Establishing and managing students' cooperative book club**
- **Organizing information dissemination and application programme related to continuing and higher education opportunities and how to apply for them, for the students**
- **Organizing short training programmes on public speaking**

2. **Organizing any group activity consists of planning the activity and implementing the plan**.

3. **Process of planning any group activity consists of:-**
    a. Deciding objectives of the activity
    b. Deciding main sub-activities to achieve objectives
    c. Deciding who will be responsible for doing sub-activities
    d. Deciding what pre-requisite information /knowledge/ability is required to complete the any sub-activity
    e. Deciding what resources will be required to conduct the sub-activities
    f. Deciding the expected duration of sub-activities

g. Deciding at start and finish times of sub-activities

4. Suggested activity plan format(table) :-

S. No.	Sub-activity number	Sub-activity description	Responsible group member	Duration	Start date	Finish date	Pre-requisite Knowledge /Information required	Resource required

5. Implementing the plan consists of:-

a. Educating responsible members about how and when to perform the assigned sub-activity

b. Acquiring necessary pre-requisite knowledge/ information / ability before starting any sub-activity

c. Arranging resources for various sub activities and provide to responsible members

d. Ensuring timely start and finish of the different sub activities

e. If necessary, revising and updating the plan during its implementation

6. Learning from organizing the activities:-

After organizing the activity, student groups will answer following self questions about their experiences of organizing the activities

a. What problems we have faced during activity planning and implementation?

b. How we managed to solve them?

c. What mistakes and errors we committed in planning and implementation of these activities?

d. What we have learned from these mistakes and errors?

e. In future, what precautions we will take if we will be asked to again organize this activity?

f. What are suggestions to improve planning and implementation of this activity?

7. Each student group should be allotted an activity from the above suggested list of professional body related activities.

8. **Assessment criteria and their weights:-**

S. No.	Criteria	Marks
1.	Extent of quality in Student's group activity plan	03
2.	Extent of quality in Implementation of the activity plan	03
3.	Extent of learning occurred through performing the group activity	04

9. In course of Professional Development-IV, department may assign teaching learning of one course outcome to one teacher and may also divide students into three batches B1, B2, B3. Simultaneously three student batch will work under the three teachers for the three course outcomes and then the batches will work for next course outcomes under remaining two teachers as per following arrangement:

	T1	T2	T3
	CO1	CO2	CO3
FIRST 20 PERIODS	B1	B2	B3
SECOND 20 PERIODS	B2	B3	B1
THIRD 20 PERIODS	B3	B1	B2

10. The concerned teacher of CO1 may Divide the batch of students under him / her into small groups (4-5 students)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No.
					4	0	5	1	2	4

COURSE NAME	**Professional Development- IV**
CO Description	**Student will be able to organize activities related to student chapters of professional bodies and student related academic events of the department**
LO Description	**Student will be able to organize student related academic events of the department**

SCHEME OF STUDY

S. No	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Planning and organizing group activities and events, deciding sub-activities, distributing responsibilities, arranging resources sub-activities, scheduling sub-activities	Traditional lecture method + Case Study	Teacher will teach students how activities are planned and organized, will discuss examples and cases. Teacher will form small student groups, guide them to plan and organize the activities assigned to their group, teacher will supervise their implementation of the activity plans and correct their mistakes , teacher will ensure their learning through organizing the related different activities	04	06	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Student activity/task	The teacher will ask the students to organize small group-activity events Teacher will observe and assess the extent of quality of plan, implementation of the plan and student's learning for organizing student related academic events of the department	15	Rating Scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. **Suggested student related academic events/ activities of the department:**

- **Organizing departmental award ceremonies for departmental outstanding students and high academic achievers**
- **Organizing departmental bulletin board preparation group activities for creating awareness about various scholarships, career prospects etc and awarding the best prepared bulletin board**
- **Organizing departmental faculty appreciation events**
- **Editing and publishing departmental newsletter and departmental magazine**
- **Updating departmental section at college web site/ web portal**
- **Organizing expert lectures of experts of local industry**
- **Organizing lectures of social, enterprising, professional achievers of nearby community**
- **Organizing expert lectures on morality, values, ethics and professional ethics**

2. **Organizing any group activity consists of planning the activity and implementing the plan**.

3. **Process of planning any group activity consists of:-**
    a. Deciding objectives of the activity
    b. Deciding main sub-activities to achieve objectives
    c. Deciding who will be responsible for doing sub-activities
    d. Deciding what pre-requisite information /knowledge/ability is required to complete the any sub-activity
    e. Deciding what resources will be required to conduct the sub-activities
    f. Deciding the expected duration of sub-activities
    g. Deciding at start and finish times of sub-activities

4. **Suggested activity plan format(table) :-**

S. No.	Sub-activity number	Sub-activity description	Responsible group member	Duration	Start date	Finish date	Pre-requisite Knowledge /Information required	Resource required

5. **Implementing the plan consists of:-**
    a. Educating responsible members about how and when to perform the assigned sub-activity
    b. Acquiring necessary pre-requisite knowledge/ information / ability before starting any sub-activity
    c. Arranging resources for various sub activities and provide to responsible members
    d. Ensuring timely start and finish of the different sub activities
    e. If necessary, revising and updating the plan during its implementation

6. **Learning from organizing the activities:-**

    After organizing the activity, student groups will answer following self questions about their experiences of organizing the activities

    a. **What problems we have faced during activity planning and implementation?**
    b. **How we managed to solve them?**
    c. **What mistakes and errors we committed in planning and implementation of these activities?**
    d. **What we have learned from these mistakes and errors?**
    e. **In future, what precautions we will take if we will be asked to again organize this activity?**
    f. **What are suggestions to improve planning and implementation of this activity?**

7. Each student group should be allotted an activity from the above suggested list of professional body related activities.

8. Assessment criteria and their weights:-

S. No.	Criteria	Marks
1.	Extent of quality in Student's group activity plan	03
2.	Extent of quality in Implementation of the activity plan	03
3.	Extent of learning occurred through performing the group activity	04

9. In course of Professional Development-IV, department may assign teaching learning of one course outcome to one teacher and may also divide students into three batches B1, B2, B3. Simultaneously three student batch will work under the three teachers for the three course outcomes and then the batches will work for next course outcomes under remaining two teachers as per following arrangement:

	T1	T2	T3
	CO1	CO2	CO3
FIRST 20 PERIODS	B1	B2	B3
SECOND 20 PERIODS	B2	B3	B1
THIRD 20 PERIODS	B3	B1	B2

10. The concerned teacher of CO1 may Divide the batch of students under him / her into small groups (4-5 students)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No.
					4	0	5	2	1	4

COURSE NAME	**Professional Development-IV**
CO Description	**Student will be able to demonstrate self-learning through joining available free online short training programmes preferably of NPTEL / MOOCs / Podcast and different online webinars related to his /her professional development**
LO Description	**Student will be able to prepare a report on his/her self learn from attending an available free online training programme**

SCHEME OF STUDY

S. No	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Need of training programmes, online short training programmes for students, various sources, programme selection and joining, preparation of report about self-learning from attending the online training programme	Traditional lecture method + Case Study	Teacher will guide students regarding how to search, select and how to join the available free online short training programmes available for students. Teacher will also teach and guide students regarding how to prepare report about self-learning from the attended training programmes.	06	04	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Assessment of Student assignment	The teacher will assess the extent of student's self-learning, through examining the report prepared and submitted by the student regarding the attended online training programme	15	Rating Scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. The online students' training programme may be of duration 3 to 5 days or equivalent duration in hours
2. Each student should join at-least one such online programme

3. If few students are unable to join online training programmes, then for them department / institution should organize a short training programme for them

4. Suggested format for report:-

1. Title
2. General information:-
    1. Name
    2. Roll number
    3. Class /semester
    4. Place and date
3. Information regarding attended online training programme:-
    1. Name
    2. Duration, start and finish dates
    3. Organizing agency
    4. Internet link or plateform
4. My experience and learning about searching, joining and attending the online training programmes:-
    1. Major problems faced by me:-
    2. How I solved those problems:-
    3. Significant incidences:-
    4. What precautions I would take if I join similar programme in future:-
    5. What suggestions I would like to give to junior students regarding searching, joining and attending online training programmes:-
5. My learning on topic of online training:-
6. Signature

5. **Assessment criteria and their weights:-**

S. No.	Criteria	Max. Marks
1	Extent of **student's self learning regarding searching, joining and attending any online training programme** (based on report)	**4**
2	Extent of student's **self learning on the topic of the online training programme** (based on report)	**4**
3	Quality of student's **report** prepared on his/her self-Learning from attending the online training programme	**2**

6. In course of Professional Development-IV, department may assign teaching learning of each of three course outcomes to each of three teachers and may also divide students into three batches B1, B2, B3. Simultaneously three student batch will work under all the three teachers for all the three course outcomes and then the batches will work for next course outcomes under remaining two teachers as per following arrangement:

	T1	T2	T3
	CO1	CO2	CO3
FIRST 20 PERIODS	B1	B2	B3
SECOND 20 PERIODS	B2	B3	B1
THIRD 20 PERIODS	B3	B2	B1

7. The concerned teacher of CO1 may Divide the batch of students under him / her into small groups (4-5 students)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No.
					4	0	5	2	2	4

COURSE NAME	**Professional Development-IV**
CO Description	**Student will be able to demonstrate self-learning through joining available free online short training programmes preferably of NPTEL / MOOCs / Podcast and different online webinars related to his /her professional development**
LO Description	**Student will be able to present his/her self-learning from attending the available online training programme through Power-Point Presentation**

SCHEME OF STUDY

S. No	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	PPP preparation and presentation skills	Traditional lecture method + Case Study	Teacher will teach skills for PPP preparation and presentation skills to the students through examples and cases, teacher will provide feedback and suggestions on each student's PPP, teacher will guide and correct students during their presentations, teacher will solve their problems	06	04	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Assessment of Student presentation	The teacher will arrange a departmental seminar in which students will present their PPP on their self-learning from attending online training programme and teacher will assess the presentation skills of individual students.	10	Rating Scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. **Assessment criteria and their weights:-**

S. No.	Criteria	Max. Marks
1	Extent of **self learning** as reflected from the **PPP-contents**	**3**

2	Extent of **self-learning** as reflected from the student's **presentation** and related discussion	**3**
3	Overall quality of the PPP	**2**
5	Extent of appropriateness of presenter's body postures, face expressions and quality of speaking	**2**

2. In course of Professional Development-IV, department may assign teaching learning of each of three course outcomes to each of three teachers and may also divide students into three batches B1, B2, B3. Simultaneously three student batch will work under all the three teachers for all the three course outcomes and then the batches will work for next course outcomes under remaining two teachers as per following arrangement:

	T1	T2	T3
	CO1	CO2	CO3
FIRST 20 PERIODS	B1	B2	B3
SECOND 20 PERIODS	B2	B3	B1
THIRD 20 PERIODS	B3	B2	B1

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No.
					4	0	5	3	1	4

COURSE NAME	**Professional Development-IV**
CO Description	**Student will be able to present his/ her knowledge about given quality related concepts prevailing in industry /professions**
LO Description	**The student will be able to demonstrate his / her knowledge about ensuring quality in professional services offered to clients**

SCHEME OF STUDY

S. No	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Professional service, need and importance of quality in professional service, various factors affecting quality of professional service, ensuring quality in professional service	Traditional lecture method + Case Study	Teacher will teach students regarding the content through explaining cases and examples, Teacher will also provide assignment of case study with few end questions, to students and provide feedback on their submitted assignments to correct and improve their learning	06	04	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Assessment of Student assignment	The teacher will provide a case (with four descriptive answer type questions at the end) on issues of quality in offered professional service. After studying the case, students will write answers for the five descriptive answer type questions.	10	Rating Scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. **Professional services**: - These are the services offered by the professional to his/her client.

Examples of professional services include:

- **Legal services**
- **Accounting and bookkeeping**
- **Marketing consultancy**
- **Architecture**
- **IT services, and more.**

2. **Factors affecting the quality of professional services:-**

    1. **Timely and accurate assessment** of the client's need
    2. **Educating the clients** regarding merits and limitations of the different services being offered
    3. **Offering prompt services** to clients
    4. **Offering services in accordance with standards formed** and communicated to the clients
    5. **Timely and constructively handling client's doubts**, quarries and complaints
    6. **Getting client's feedback or conducting clients' satisfaction surveys** about the professional services provided and improving the services
    7. **Keeping Honesty and loyalty** with the client

8. **Creating trustworthiness** with the client
9. **Ensuring transparency in providing services through proper documentation** and sharing documents of services provided with the client
10. **Getting accreditation certificate, for the professional services being offered to the clients, of the related approved quality assessing agencies**

3. Suggested list of case-end questions:-

1. How many professional service related quality issues involved in this case?
2. Describe all the professional service related quality issues?
3. How these issues can be resolved?
4. In this case, according to you what should be the professional-client service system to ensure quality in professional services?

5. Assessment criteria and their weights:-

S. No.	Criteria	Max. Marks
1	Appropriateness of student's answer to first question	**02**
2	Appropriateness of student's answer to second question	**02**
3	Appropriateness of student's answer to third question	**03**
4	Appropriateness of student's answer to fourth question	**03**

6. In course of Professional Development-IV, department may assign teaching learning of each of three course outcomes to each of three teachers and may also divide students into three batches B1, B2, B3. Simultaneously three student batch will work under all the three teachers for all the three course outcomes and then the batches will work for next course outcomes under remaining two teachers as per following arrangement:

	T1	T2	T3
	CO1	CO2	CO3
FIRST 20 PERIODS	B1	B2	B3
SECOND 20 PERIODS	B2	B3	B1
THIRD 20 PERIODS	B3	B2	B1

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No.
					4	0	5	3	2	4

COURSE NAME	**Professional Development- IV**
CO Description	**Student will be able to present his/ her knowledge about given quality related concepts prevailing in industry /professions**
LO Description	**The student will be able to present his/her knowledge about given practices or cultures like TQM / ISO9000 / Quality circle / Quality Control / Quality Audit / Six Sigma / Kaizen etc through a PowerPoint presentation**

SCHEME OF STUDY

S. No	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Industrial practices or cultures like TQM / ISO9000 / Quality circle / quality control / quality audit / Six Sigma, kaizen etc, PP presentation skills	Traditional lecture method + Case Study	Teacher will teach concepts of various industrial practices, teacher will develop skills for PP preparation and presentation skills in the students, teacher will observe and improve student PP presentation, teacher will guide and correct students during their presentation, teacher will solve their problems and provide feedback	06	04	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Assessment of Student presentation	The teacher will arrange a departmental seminar in which students will present their PPP on their knowledge about industrial practices teacher will assess the knowledge as well as PowerPoint Presentation of individual students.	15	Rating Scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. **Assessment criteria and their weights:-**

S. No.	Criteria	Max. Marks
1	Extent of understanding formed about quality practices/culture **as reflected from PPP contents**	**6**
2	Extent of understanding formed about quality practices /culture **as reflected from student's presentation**	**4**
3	Extent of relevance, appropriateness of the PPP content	**3**
4	Extent of visual effectiveness in PPP	**2**

2. In course of Professional Development-IV, department may assign teaching learning of each of three course outcomes to each of three teachers and may also divide students into three batches B1, B2, B3. Simultaneously three student batch will work under all the three teachers for all the three course outcomes and then the batches will work for next course outcomes under remaining two teachers as per following arrangement:

	T1	T2	T3
	CO1	CO2	CO3
FIRST 20 PERIODS	B1	B2	B3
SECOND 20 PERIODS	B2	B3	B1
THIRD 20 PERIODS	B3	B2	B1

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Branch	ALL BRACHES OF IV SEMESTER	Semester	IV

Course Code	405	Course Name	PROFESSIONAL DEVELOPMENT –IV

Course Outcome 1	Student will be able to organize activities related to student chapters of professional bodies and student related academic events of the department	Teach Hrs	Marks
Learning Outcome 1	Student will be able to organize activities related to student chapters of professional bodies	10	10
Contents	Planning and organizing group activities and events, deciding subactivities, distributing responsibilities, arranging resources sub-activities, scheduling subactivities		
Method of Assessment	Internal Assessment of Student presentation		
Learning Outcome 2	Student will be able to organize student related academic events of the department	10	15
Contents	Planning and organizing group activities and events, deciding subactivities, distributing responsibilities, arranging resources sub-activities, scheduling subactivities		
Method of Assessment	Internal Assessment of Student presentation		

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Branch	ALL BRANCHES	Semester	IV
Course Code	405	Course Name	PD –IV

Course Outcome 2	Student will be able to demonstrate self-learning through joining available free online short training programmes preferably of NPTEL / MOOCs / Podcast and different online webinars related to his /her professional development	Teach Hrs	Marks
Learning Outcome 1	Student will be able to prepare a report on his/her self learn from attending an available free online training programme	10	15
Contents	Need of training programmes,online short training programmes for students, various sources, programme selection and joining, preparation of report about selflearning from attending the online training programme		
Method of Assessment	Internal Assessment of Student presentation		
Learning Outcome 2	Student will be able to present his/her self-learning from attending the available online training programme through Power-Point Presentation	10	10
Contents	PPP preparationand presentation skills		
Method of Assessment	Internal Assessment of Student presentation		

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Branch	ALL BRANCHES	Semester	IV

Course Code	405	Course Name	Professional development –iv

Course Outcome 3	Student will be able to present his/ her knowledge about given quality related concepts prevailing in industry /professions	Teach Hrs	Marks
Learning Outcome 1	The student will be able to demonstrate his / her knowledge about ensuring quality in professional services offered to clients	10	10
Contents	Professional service, need and importance of quality in professional service, various factors affecting quality of professional service, ensuring quality in professional service		
Method of Assessment	Internal Assessment of Student assignment		
Learning Outcome 2	The student will be able to present his/her knowledge about given practices or cultures like TQM / ISO9000 / Quality circle / Quality Control / Quality Audit / Six Sigma / Kaizen etc through a PowerPoint presentation	10	15
Contents	Industrial practices or cultures like TQM / ISO9000 / Quality circle / quality control / quality audit / Six Sigma, kaizen etc, PP presentation skills		
Method of Assessment	Internal Assessment of Student presentation		