DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO.SU/Sci./B.Sc. Syll./31/2015

It is hereby notified for information to all the concerned that, on the recommendation of the various Board of Studies, Ad-hoc Boards & Committees the Hon'ble Vice-Chancellor has accepted the **revised semester-wise syllabi in the Faculty of Science as under** on behalf of the Academic Council under Section-14[7] of the Maharashtra Universities Act, 1994 :-

Sr. No.	Name of the Subject	Semester
[1]	B.Sc. Automobile Technology IInd Year, [Three Year Degree Course].	III & IV
[2]	B.Sc. Horticulture IInd Year, [Optional].	III & IV
[3]	B.Sc. Chemistry IIIrd Year, [Optional].	V & VI
[4]	B.Sc. Analytical Chemistry IIIrd Year, [Optional].	V & VI
[5]	B.Sc. Agrochemical & Fertilizer IIIrd Year, [Optional].	V & VI
[6]	B.Sc. Geology IIIrd Year, [Optional].	V & VI
[7]	B.Voc. Multimedia & Animation, [Three Year Degree Course].	I to IV
[8]	B.Voc. [1] Industrial Automation, [2] Automobile & [3] Travel & Tourism, [Three Year Degree Course].	I to VI
[9]	B.Voc. Jewellery Design & Gemology, IInd Year [Three Year Degree Course].	III & IV
[10]	Diploma in Industrial Automation for Community College at University Campus.	

This is effective from the Academic Year 2015-16 & onwards as appended herewith.

All concerned are requested to note the contents of the circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.ACAD/SU/SCI./
2015/6860-7259
Date:- 08-07-2015.

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Director,
Board of College and University Development.

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Copy forwarded with compliments to:-

1] The Director, C.V.E.T., Dr. Babasaheb Ambedkar Marathwada University Campus, Aurangabad.

2] The Principals, affiliated concerned colleges,
Dr. Babasaheb Ambedkar Marathwada University

Copy to :-

1] The Controller of Examinations,
2] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter, Dr. Babasaheb Ambedkar Marathwada University,
3] The Superintendent, [B.Sc. Unit],
4] The Superintendent, [B.C.S. Unit],
5] The Programmer [Computer Unit-1] Examinations,
6] The Programmer [Computer Unit-2] Examinations,
7] The Record Keeper.

Dr. Babasaheb Ambedkar Marathwada University.

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S*/-090715/-

Dr. Babasaheb Ambedkar Marathwada University

Aurangabad- 431004 (MS) India

Center for Vocational Education and Training (CVET)

Bachelor of Vocation
(B. Voc.)

Course Structure and Curriculum

(As per UGC guidelines for implementing B. Voc. program)

For

i. Industrial Automation (Semester- I, III, IV, V)
ii. Automobile (Semester- I, III)
iii. Travel and Tourism (Semester- III, IV, V, VI)

(Choice Based Credit System)

(Effective from June 2015 and onwards)

Curriculum for Bachelor in Vocation
(B. Voc.)

(Choice Based Credit System)

This Bachelor in Vocation programme is divided into six semester shaving 192credits.Each semester will have courses based on General Education Components and Skill Development Components, out of which five courses will be dedicated for theory (each theory course will have inbuilt practical / tutorial/ skill development components) and three courses will be devoted to Laboratory Work / Project / Industrial Training / In-plant Internship. This programe offers following **General Education Component** sviz. Linguistic Proficiency, Computer Science, Environment Management, Business & Accounting, Industrial Ethics and Safety Management, Statistical Tools, Commerce & Management Fundamentals and following **Skill Development Components** viz Industrial Automation, Automobile, Travel and Tourism.

Preamble:

Dr. Babasaheb Ambedkar Marathwada University (BAMU) proposes to offer at three year Bachelor programme invocation (B. Voc.).The curriculum design of this program is undertaken in the following framework (assumptions).

a) Although there has been remarkable progress in all sectors of education in last couple of decades, the less regulated area of the education sector-vocational training---seems to have lost its significance/importance. This has led to the widening gap between the supply and demand for skilled manpower across various industries and R&D organizations. This shortage of skills has translated directly into unemployment among an increasing number of graduates who pass-out every year and are forced to bare- trained in order to become market table.

   This programme is designed to produce a skilled manpower so that wide variety of options in automobiles, industrial automation and travel &tourism would be available and it will improve the opportunities for the unemployed youths in the country in both the private and public sectors.

b) According to a study conducted by the Associated Chambers of Commerce and Industry of India (ASSOCHAM), there will be a deficit of 40 million working

   professionals by the year 2020 and the employers would face the difficulty of

filling positions because of the dearth of suitable talent and skilled person all in their industry. **This programme aims to provide some solution for this problem and this would facilitate to improve:**

(i) Quality of training
(ii) High drop-out rates
(iii) Linkages with Universities and industry
(iv) Inadequacy of resources.

c) **This programme is intended to offer practical training and skills needed to pursue an occupation straight away. It will provide options to the students to select the courses of their choice which are directly aligned to land a job in a chosen profession or a skilled trade. The end result of this programme is to enable an individual to at train self-employment.**

Program Outcomes:

Vocational Education is education that prepares the students for specific trades, crafts and career sat various levels and scopes. It trains the students from a trade/ craft, technician or professional position in R & D organizations.

The Program Outcomes are the skills and knowledge which the students have at each exit level/at the time of graduation. These Outcomes are generic and are common to all exit levels mentioned in the programme structure.

i. Students with vocational training can find work in several state and central government organizations, non-profit groups, academic institutions and in private sectors.

ii. This programme prepares students for specific types of occupations and frequently for direct entry into the labour market.

iii. After completion of this programme students will have enough competences, to get benefit from labour market opportunities.

iv. This programme would enable students to update their knowledge and professional skills for entering the work force executing in come generating activities or occupying better positions;

v. At each exit level of this programme, students will be able to
   a) Apply knowledge of general education subjects and skill development subjects to the conceptualization of engineering models.
   b) Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

c) Conduct investigations of complex problems including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
d) Create, select and apply appropriate techniques, resources, and modern engineering tools, including prediction and modeling, to complex engineering activities, with an understanding of the limitations.
e) Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
f) Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
g) Demonstrate understanding of the social, health, safety, legal and cultural issues and the consequent responsibilities relevant to science and engineering practice.
h) Understand and commit to professional ethics and responsibilities and norms of science and engineering practice.
i) Understand the impact of science and engineering solutions in a societal context and demonstrate knowledge of and need for sustainable development.
j) Demonstrate a knowledge and understanding of management and business practices, such as risk and change management and understand their limitations.
k) Recognize the need for, and have the ability to engage in independent and life- long learning.

Exit Options:

The course allows exit of a student from the course on successful employment. Scopes will be there for further continuation of study. The other wise exit options will be as follows-

Exit Point	*Duration*	*Diploma / Degree to be Offered*
First exit	After 6 months	Certificate in Vocation
Second exit	After 1 yr.	Diploma in Vocation(D. Voc.)
Third exit	After 2 yrs.	Advanced Diploma in Vocation(Adv. D. Voc.)
Fourth exit	After 3 yrs.	Bachelor in Vocation(B. Voc.)

Eligibility:

Automobile, Industrial Automation:

Those who have completed XII Science OR equivalent/ MCVC / ITI (Two Years) with relevant / equivalent trade from any recognized Board/Institution are eligible for registration / admission.

Admission / Promotion Process:

In response to the advertisement for registration, interested students will have to register themselves.Admissionwillbedoneonthebasisofperformanceofstudentsat Common Entrance Test(CET) and personal interviews. The CET will be conducted in the month of June every year. The students will have to clear / qualify at least 50% of theory papers / courses from second semester and all papers / courses (inclusive of theory and practical) from first semester for getting promoted to second year. Similarly the students will have to clear / qualify at least 50% of theory papers / courses from fourth semester and all papers / courses (inclusive of theory and practical) from third semester for getting promoted to third year.

Dropout students will be allowed to register for second or third year as and when the concerned courses are offered by the Centre, however he/she should not exceed more than twice the duration of the course from the date of first registration at the Centre. Therefore, for obtaining B. Voc. degree a student has to complete all semesters successfully within 6 years/12 semesters.

Choice Based Credit System (CBCS):

The choice based credit system is going to be adopted by this Centre. This provides flexibility to make the system more responsive to the changing needs of our students, theprofessionalsandsociety.Itgivesgreaterfreedomtostudentstodeterminetheirownpaceofstudy. The credit based system also facilitates the transfer of credits.

- Students will have to earn 30 credits for the award of Six Month Certificate in Vocation
- Students will have to earn 60credits for the award of one year Diploma in Vocation (D. Voc.)
- Students will have to earn 120credits for the award of two year Advance Diploma in Vocation (Adv. D. Voc.)
- Students will have to earn 180credits for the award of three year Bachelor Degree in Vocation (B. Voc.)

Credit-to-contact hour Mapping:

(a) One Credit would mean equivalent of 15 periods of 60 minutes each for theory lecture.

(b) For labcourse/ workshops/internship/field work/project, the credit weightage for equivalent hours shall be 50% that for lectures /workshop

(c) For self- learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

Attendance:

Students must have 75 % of attendance in each course for appearing examination otherwise he / she will not be strictly allowed for appearing the examination of each course.

Departmental Committee:

The Departmental Committee (DC) of the Centre will monitor the smooth functioning of the programme.

Results Grievances / Redressal Committee

Grievances / redressal committee will be constituted in the department to resolve all grievances relating to the evaluation. The committee shall consist of Head of the department, the concerned teacher of a particular course and senior faculty member of Department of Committee. The decision of Grievances / redressal committee will have to be approved by Department committee.

Evaluation Methods:

- The assessment will be based on 50: 50 ratio of continuous internal assessment (CIA) and semester end examination (SEE).

Continuous Internal Assessment (CIA):

- There will be 50 marks for Continuous Internal Assessment. Distribution of 50 marks will be as follows- 05 marks for tutorials, 05 marks for assignment, 10 marks for seminar presentation and 30 marks for weekly tests. Weekly tests of 10 marks each based on subjective short questions will be conducted every week during the semester as a part of continuous assessment. At the end of the semester average of all weekly tests will be converted into 30 marks. The setting of the question papers and the assessment will be done by the concerned teacher.

(A) For 4 credit courses-

- There will be 50 marks for Continuous Internal Assessment. Distribution of 50 marks will be as follows- 05 marks for tutorials, 05 marks for assignment, 10 marks for seminar presentation and 30 marks for weekly tests. Weekly tests of 10 marks each based on subjective short questions will be conducted every week during the semester as a part of continuous assessment. At the end of the semester average of all weekly tests will be converted into 30 marks. The setting of the question papers and the assessment will be done by the concerned teacher.

(B) For 4 credit courses-

- There will be 25 marks for Continuous Internal Assessment. Distribution of 25 marks will be as follows- 05 marks for tutorials, 05 marks for assignment, 05 marks for seminar presentation and 10 marks for weekly tests. Weekly tests of 10 marks each based on subjective short questions will be conducted every week during the semester as a part of continuous assessment. At the end of the semester, average of all weekly tests will be considered for calculation of final marks. The setting of the question papers and the assessment will be done by the concerned teacher.

Semester End Examination (SEE):

- The semester end theory examination for each theory course will be of 50 marks. The total marks shall be 100 for 4 credit theory course (50 marks semester end exam + 50 marks CIA) and 50 for 2 credit theory course (25 marks semester end exam + 25 marks CIA).

- Semester end examination (SEE) time table will be declared by the departmental committee (as per the university annual calendar). The paper setting and assessment of theory courses, laboratory courses and research project will done by external (50 %) and internal (50%) examiners. However, in case of non-availability of external examiner for either paper setting or assessment or both, department committee will be empowered to take appropriate decision.

- Pattern of semester end question paper will be as below:

(A) For 4 credit courses-

- The semester end examination of theory course will have two parts (10+40 = 50 Marks)
- Part A will be consisting of 10 questions having 1 marks each (multiple choice questions / fill in the blanks/ answer in sentence) as compulsory questions and it should cover entire course curriculum (10 Marks)
- Part B will carry 8 questions (02 questions from each of 04 units and students will have to attempt any one). Therefore, students will have to attempt 04 questions out of 08 (40 Marks).
- 20 to 30% weightage can be given to problems/ numerical wherein use of non-programmable scientific calculator may be allowed.
- Number of sub questions (with allotment of marks) in a question may be decided by the examiner.

(B) For 2 credit courses-

- The semester end examination of theory course will have two parts (05+20 = 25 Marks)

- Part A will be consisting of 05 questions having 1 marks each (multiple choice questions / fill in the blanks/ answer in sentence) as compulsory questions and it should cover entire course curriculum (05 Marks)
- Part B will carry 8 questions (02 questions from each of 04 units and students will have to attempt any one). Therefore, students will have to attempt 04 questions out of 08 (20 Marks).
- 20 to 30% weightage can be given to problems/ numerical wherein use of non-programmable scientific calculator may be allowed.
- Number of sub questions (with allotment of marks) in a question may be decided by the examiner.

- Assessment of laboratory courses and project will also have 50 % internal and 50 % semester end assessment. Semester end practical examination will be of 25 marks and 25 marks will be for internal examination. Student must perform at least eight experiments from each laboratory course. The semester end practical examination will be conducted at the end of each semester along with the theory examination.

- At the end of each semester the Departmental Committee will assign grades to the students. The result sheet will be prepared in duplicate.

- The Director of the Centre shall send all results to the Controller of Examination for further processing.

- Every student will have privilege for revaluation of answer sheets or recounting of marks for each semester end examination. However, students will have to submit an application within 15 days from the date of declaration of results.

- Applications received for revaluation / recounting will be discussed in the Departmental committee and examiners will be appointed accordingly.

- The results of revaluation / recounting will be approved by Departmental committee and forwarded to Controller of Examination for further processing.

Earning Credits:

At the end of every semester, a letter grade will be awarded in each course for which a student had registered. A student's performance will be measured by the number of credits that he/she earned by the weighted Grade Point Average (GPA). The SGPA (Semester Grade Point Average) will be awarded after completion of respective semester and the CGPA (Cumulative Grade Point Average) will be awarded at the respective exit point.

Grading System:

- The grading reflects a student-own proficiency in the course. A ten point rating scale shall be used for the evaluation of the performance of the students to provide letter grade for each course and overall grade for the Master Programme. Grade points are based on the total number of marks obtained by him / her in all heads of the examination of the course. The grade points and their equivalent range of marks are shown in Table-I

Table – I : Ten point grade and grade description

Marks Obtained (%)	Grade Point	Letter Grade	Description
90-100	9.00- 10	O	Outstanding
80-89	8.00-8.90	A^{++}	Exceptional
70-79	7.00-7.90	A^{+}	Excellent
60-69	6.00-6.90	A	Very Good
55-59	5.50-5.90	B^{+}	Good
50-54	5.00-5.40	B	Fair
45-49	4.50-4.90	C^{++}	Average (Above)
41-44	4.1-4.49	C	Average
40	4.0	P	Pass
< 40	0.0	F	Fail (Unsatisfactory
	0.0	AB	Absent

- Non-appearance in any examination / assessment shall be treated as the students have secured zero marks in that subject examination / assessment.
- Minimum P grade (4.00 grade points) shall be the limit to clear / pass the course / subject. A student with F grade will be considered as "failed" in the concerned course and he / she has to clear the course by appearing in the next successive semester examinations. There will be no revaluation or recounting under this system.
- Every student shall be awarded grade points out of maximum 10 points in each subject (based on 10 point scale). Based on the grade points obtained in each subject, Semester Grade Point Average (SGPA) and then Cumulative Grade Point Average (CGPA) shall be computed. Results will be announced at the end of each semester and CGPA will be given at respective exit point.

Computation of SGPA (Semester Grade Point Average) and CGPA (Cumulative Grade Point Average)

Grade in each subject / course will be calculated based on the summation of marks obtained in all five modules.

The computation of SGPA and CGPA will be as below

- Semester Grade Point Average (SGPA) is the weighted average points obtained by the students in a semester and will be computed as follows

$$SGPA = \frac{\text{Sum (Course Credits) X Number of Grade Points in concerned Course Gained by the Student}}{\text{Sum (Course Credits)}}$$

The SGPA will be mentioned on the grade card at the end of every semester.

- The Cumulative Grade Point Average (CGPA) will be used to describe the overall performance of a student in all semester of the course and will be computed as under.

$$CGPA = \frac{\text{Sum (All six Semester SGPA)}}{\text{Total Number of Semester}}$$

The SGPA and CGPA shall be rounded off to the second place of decimal.

Grade Card

Results will be declared by the Centre and the grade card (containing the grades obtained by the student along with SGPA) will be issued by the university after completion of every semester. The grade card will be consisting of following details.

- Title of the courses along with code opted by the student.
- Credits associated with the course.
- Grades and grade points secured by the student.
- Total credits earned by the student in a particular semester.
- Total credits earned by the students till that semester.
- SGPA of the student.
- CGPA of the student (at respective exit point).

Cumulative Grade Card

The grade card showing details grades secured by the student in each subject in all semesters along with overall CGPA will be issued by the University at respective exit point.

Course Structure

Paper No	Paper Title	Credits
	Semester - I	
General Education Components		
VOC 101	Linguistic Proficiency-I (English& Marathi) with Language lab training	4
VOC 102	Computer Fundamentals-I (Information Technology) : Theory	2
VOC 103	Computer Fundamentals-I (Information Technology): Laboratory Coursework	2
VOC 104	Professional Ethics and Management Practices	4
Skill Development Components - Industrial Automation (A)		
VOC 111	Analog and Digital Electronics	2
VOC 112	Electrical Systems	2
VOC 113	Industrial Electronics	2
VOC 114	Industrial Instrumentation	2
VOC 115	Laboratory Coursework – I (IA)(Analog and Digital Electronics)	2
VOC 116	Laboratory Coursework – II (IA) (Electrical Systems)	2
VOC 117	Laboratory Coursework – III (IA) (Industrial Electronics)	2
VOC 118	Laboratory Coursework – IV (IA) (Industrial Instrumentation)	2
VOC 119	In-plant Training – I (IA) (MCC and PCC panel Wiring)	2
Skill Development Components - Automobile (B)		
VOC 131	Automobile Technology	2
VOC 132	Automotive Tools and Equipments	2
VOC 133	Workshop Technology	2
VOC 134	Engineering Drawing	2
VOC 135	Laboratory Course –I (AU)(Automobile Technology)	2
VOC 136	Laboratory Course –II (AU) (Automotive Tools and Equipments)	2
VOC 137	Laboratory Course – III (AU) (Workshop Technology)	2
VOC 138	Laboratory Course – IV (AU) (Engineering Drawing)	2
VOC 139	In-plant Training – I (AU)	2
Total Credits = General Education Components + Skill Development Components (A/B/C)		12+18 =30
	Semester - II	
General Education Components		
Skill Development Components - Industrial Automation (A)		
VOC 211	Interfacing and Signal Conditioning	2
VOC 212	Control Systems Fundamentals	2
VOC 213	Fundamentals of Drives	2
VOC 214	PLC Fundamentals	2
VOC 215	Laboratory Coursework–V (IA)(Interfacing and Signal Conditioning)	2

VOC 216	Laboratory Coursework – VI (Control Systems Fundamentals)	2
VOC 217	Laboratory Coursework – VII (Fundamentals of Drives)	2
VOC 218	Laboratory Coursework – VIII (PLC Fundamentals)	2
VOC 219	In-plant Training – II (Control Panel Design and Wiring)	2
VOC 211	Automobile - V	2
VOC 212	Automobile - VI	2
VOC 213	Automobile - VII	2
VOC 214	Automobile - VIII	2
VOC 215	Laboratory Coursework – V(AU)	2
VOC 216	Laboratory Coursework – VI (AU)	2
VOC 217	Laboratory Coursework – VII (AU)	2
VOC 218	Laboratory Coursework – VIII (AU)	2
VOC 219	In-plant Training – II (AU)	2
Total Credits = General Educational Components + Skill Development Components(A/B/C)		12+18 =30
	Semester – III	
General Education Components		
VOC 301	Linguistic Proficiency-III	4
VOC 302	Business Software Tools –I	4
VOC 303	Statistical Tools (Probability and Statistics)	4
Skill Development Components - Industrial Automation (A)		
VOC 311	Voc-III (Control Systems and Drives)	4
VOC 312	Voc-IV (Industrial Electronics and Instrumentation)	4
VOC 313	Laboratory Course –V	3
VOC 314	Laboratory Course –VI	3
VOC 315	In-plant Internship/Field Work/ Project	4
Skill Development Components - Travel and Tourism (B)		
VOC 321	Voc-III (Travel Agency and Tour Operations)	4
VOC 322	Voc-IV (Travel Documentation)	4
VOC 323	Laboratory Course –V	3
VOC 324	Laboratory Course –VI	3
VOC 325	In-plant Internship/Field Work/ Project	4
Skill Development Components – Automobile (C)		
VOC 331	Automotive Components and Drawing	4
VOC 332	Automotive Electricals and Electronics	4
VOC 333	Laboratory Course –V	3
VOC 334	Laboratory Course –VI	3
VOC 335	In-plant Internship/Field Work/ Project	4
Total Credits = General Education Components + Skill Development Components (A/B/C)		12+18 =30
	Semester - IV	
General Education Components		

VOC 401	Industrial Ethics and Safety Management(for Industrial Automation and Automobile) / Ethical, Legal and Regulatory Aspects of Tourism(for Travel & Tourism)	4
VOC 402	Business Software Tools-II	4
VOC 403	Fundamentals of Business and Accounting	4
Skill Development Components - Industrial Automation (A)		
VOC 411	Voc-VI (Embedded System and PLCs- I)	4
VOC 412	Voc-VII (Pneumatics and Hydraulics)	4
VOC 413	Laboratory Course –VII	3
VOC 414	Laboratory Course –VIII	3
VOC 415	In-plant Internship/Field Work/ Project	4
Skill Development Components - Travel and Tourism (B)		
VOC 421	Voc-VI (Hotel Operation)	4
VOC 422	Voc-VII (Tourist Transfer Operation)	4
VOC 423	Laboratory Course –VII	3
VOC 424	Laboratory Course –VIII	3
VOC 425	In-plant Internship/Field Work / Project	4
Skill Development Components – Automobile (C)		
VOC 431	Voc-VI (Measurement and Control)	4
VOC 432	Voc-VII (Automotive Materials)	4
VOC 433	Laboratory Course –VII	3
VOC 434	Laboratory Course –VIII	3
VOC 435	In-plant Internship/Field Work/ Project	4
Total Credits = General Education Components + Skill Development Components (A/B/C)		12+18=30
Semester - V		
General Education Components		
VOC 501	Personality Development and Stress Management	4
VOC 502	Labour Laws and Taxation	4
VOC 503	Business Communication	2
VOC 504	Product Costing	2
Skill Development Components - Industrial Automation (A)		
VOC 511	Voc-IX (Embedded Systems and PLCs-II)	4
VOC 512	Voc-X (Manufacturing processes and Mechatronics)	4
VOC 513	Laboratory Course –IX	3
VOC 514	Major Project (Phase – I)	3
VOC 515	In-plant Internship/Field Work/ Project	4
Skill Development Components - Travel and Tourism (B)		
VOC 521	Voc-IX(Entrepreneurship in Tourism)	4
VOC 522	Voc-X(Contemporary Issues in Tourism)	4
VOC 523	Laboratory Course –IX	3
VOC 524	Major Project (Phase – I)	3

VOC 525	In-plant Internship/Field Work/ Project	4
Skill Development Components – Automobile (C)		
VOC 531	Voc-IX (Engine Testing)	4
VOC 532	Voc-X (Farming Automotive and Machinery)	4
VOC 533	Laboratory Course –IX	3
VOC 534	Major Project (Phase – I)	3
VOC 535	In-plant Internship/Field Work/ Project	4
Total Credits = General Education Components + Skill Development Components (A/B/C)		12+18=30
	Semester - VI	
General Education Components		
VOC 601	Human Resource Management	4
VOC 602	Entrepreneurship Development	4
VOC 603	Workshop Management (for Industrial Automation and Automobile) / Outdoor Management (for Travel & Tourism)	4
Skill Development Components - Industrial Automation (A)		
VOC 611	Voc-XI (Motion Control and Robotics)	4
VOC 612	Voc-XII (Process Control and Tools)	4
VOC 613	Laboratory Course –X	3
VOC 614	Major Project (Phase – II)	3
VOC 615	In-plant Internship/Field Work/ Project	4
Skill Development Components - Travel and Tourism (B)		
VOC 621	Voc-XI(Tourism Policy & Planning)	4
VOC 622	Voc-XII (Tourism Administration in India)	4
VOC 623	Laboratory Course –X	3
VOC 624	Major Project (Phase – II)	3
VOC 625	In-plant Internship/Field Work/ Project	4
Skill Development Components - Automobile (C)		
VOC 631	Voc-XI (Noise and pollution Control)	4
VOC 632	Voc-XII (Vehicle Testing)	4
VOC 633	Laboratory Course –X	3
VOC 634	Major Project (Phase – II)	3
VOC 635	In-plant Internship/Field Work/ Project	4
Total Credits = General Education Components + Skill Development Components(A/B/C)		12+18=30
	Total Credits (Semester I to VI)	180

Paper Code Description:

Each course will be identified by a unique three digit code. The details of code nomenclature is as per following –

(A) For Semester I and II -

First digit: Refers to semester number
Second digit:
0 - Refers to General paper / course
1 - Refers to Industrial Automation
2 - Refers to Automobile

Third digit: Refers to incremental number for paper / course of respective semester.

(B) For Semester III to VI -

First digit: Refers to semester number
Second digit:
0 - Refers to General paper / course
1 - Refers to Industrial Automation
2 - Refers to Travel and Tourism
3 - Refers to Automobile

Third digit: Refers to incremental number for paper / course of respective semester.

SEMESTER – I

Semester – I

General Education Components

VOC 101: Linguistic Proficiency-I (English and Marathi) with language lab training

Learning Objectives:

1. To facilitate the students to understand the fundamental of communicative English and Marathi
2. To facilitate the students to develop skills of communication in English and Marathi.

Learning Outcomes:

1. Expression power, and communication skill of the students in English and Marathi will improve
2. Students will be able to identify the necessities of behavioral and expressive attitudes as per situations.

Part A: BASIC STRUCTURE OF THE ENGLISH LANGUAGE

Module - I

Tenses:

1.Present tense .... (includes all four types of tenses each)

2. Past tense
3. Future tense

Module - II

Spoken English:

1. Basic of pronunciation : Vowels, diphthongs,
2. Certain basic sounds including th, dh, gh sounds, fricatives etc.
3. Differences in the sounds of the letters, especially, w/v, f/ph etc.
4. Phonetic transcriptions.
5.

Module - III

1. Introducing yourself (The communicator)
2. Introducing people to others
3. Giving personal information
4. Getting people's attention and interrupting
5. Giving instructions and seeking clarifications
6. Making requests and responding to requests

References:

1. Business Communicator – V.K. Jain, O. P. Biyani, S. Chand, New Delhi.
2. The Communicator – Board of Editors , Orient Blackswan Pvt. Ltd
3. The Art of Powerful Communication – Dinesh K. Vohra, Are Maria Publications, Punc

Part B :BASIC STRUCTURE OF THE MARATHILANGUAGE

(ON NEXT PAGE....)

भाग- ब)

अभ्यासक्रमाचे स्वरूप -

मराठी भाषेच्या अभ्यासाची व वापराची विविध क्षेत्रे लक्षात घेऊन हा अभ्यासक्रम तयार करण्यात आला आहे. हा अभ्यासक्रम प्रामुख्याने कृतीनिष्ठ असल्याने लेखी परीक्षे इतकेच प्रत्यक्षकृतीला त्यात महत्त्व दिले गेले आहे. भाषा व्यवहार, संज्ञापन, कार्यालयीन लेखन व्यवहार, आधुनिकतंत्रोपकरणे यांच्याशी तो संबंधित आहे. हा अभ्यासक्रम दोन श्रेयांकांचा असून दीड श्रेयांक लेखी परीक्षेशी संबंधित आहे, तर अर्धा श्रेयांक प्रकल्पाशी संबंधित आहे.

उद्दिष्टे -

१) संज्ञापनाचे स्वरूप आणि प्रकार, संज्ञापन व्यवहारातील भाषेचे महत्त्व आणि कार्य यांचे महत्त्व समजावून देणे.

२) भाषा व्यवहाराची अपारंपरिक आणि अनौपचारिक क्षेत्रे, औपचारिक भाषा व्यवहाराची क्षेत्रे आणि त्याचे क्षेत्रनिहाय स्वरूप समजावून देणे.

३) विविध स्तरावरील भाषिक कौशल्ये आणि क्षमता विकसित करणे.

४) प्रसार माध्यमांचे स्वरूप आणि त्यासाठी आवश्यक असलेल्या भाषा व्यवहाराचे स्वरूप समजावून देणे.

५) कार्यालयीन / लेखन व्यवहारातील भाषेचे स्वरूप समजावून घेणे.

६) परिभाषानिष्ठ भाषाव्यवहार म्हणजेच निरनिराळ्या शास्त्रीय विषयांवरील लेखना करिता क्षमता विकसित करणे.

७) भाषाव्यवहारातील आधुनिक तंत्रोपकरणांची (व तंत्रांची) माहिती करून देणे, मराठीतून व्यवहार करणाऱ्या संस्थांना भेटी देणे इत्यादी.

घटक४

संज्ञापन व भाषिक कौशल्ये

अ) संज्ञापन म्हणजे काय ? संज्ञापनाचे प्रकार - संज्ञापनातील भाषेचे, महत्त्व आणि कार्य भाषेचे औपचारिक व अनौपचारिक उपयोग.

आ) भाषेची प्राथमिक कौशल्ये (श्रवण, भाषण, वाचन, लेखन)

इ) भाषेची प्रगत कौशल्ये -

१) वर्णन, कथन, निवेदन, संभाषण, सूत्रसंचालनइ.
२) आकलन, संक्षेप, विस्तार, भाषांतर, गद्य रूपांतर, संवादलेखन इ.

औपचारिक भाषाव्यवहाराचे विविध प्रकार

अ) इतिवृत्त, टिप्पणी, अर्जलेखन, कार्यालयीन पत्रलेखन, निवेदन प्रसिध्दीपत्रक, निविदा इ.
ब) मुलाखत लेखन

स्मरणिका / गौरविका / संस्थापत्रिका / वार्षिक अहवाल इत्यादींचे संपादन

Module V : Tutorials, assignments and presentation based on Module I to IV

संदर्भ पुस्तके:

१) मराठी शुध्दलेखन प्रदीप - मो. रा. वाळंबे, गो. य. राणे प्रकाशन
२) मुद्रित शोधन - य. ए. धायगुडे - वि. पूना प्रेस ऑनर्स असो.
३) मराठी शुध्दलेखनविवेक - द. न. गोखले - सोSहं प्रकाशन
४) शुध्दशब्दसूची - स्नेहल तावरे - स्नेहवर्धन
५) राजभाषापरिचय -
६) व्यावहारिक मराठी - पुणेविद्यापीठ
७) व्यावहारिक मराठी - ल. रा. नरिरावादकर -फडके बुकसेलर्स,कोल्हापूर
८) व्यावहारिक मराठी - प्रकाश परब
९) वार्तासंकलन - चंद्रकांत लाम्हणे
१०) व्यावहारिक मराठी - (संपादकडॉ. स्नेहल सावरे) स्नेहवर्धन प्रकाशन, पुणे

VOC 102:Computer Fundamentals–I (Information Technology)

Learning Objectives:

1. To facilitate the students to study Instructional Designing theories, basic IT skills using application software tools,
2. To facilitate the students to make functional use of IT skills in teaching – learning process.

Learning Outcomes:

1. Students will have command on basic IT skills
2. Students will be able to use computer and internet facilities for their academic and holistic development purpose

Software for Hands-on:

- Windows Vista
- MS Office 2007
- Internet Explorer
- Online collaboration tools

This course offers the following modules:

Module - I: Word Processing

- Overview of Word Processing
- Creating and Editing a Document (Exercise 1 - Creating Notice)
- Revising and Refining a Document (Exercise 2 - Revise your notice)
- Using Additional Word Features (Exercise 3 – Creating notice for different classes)
- Changing the Display of the Document (Exercise 4 - Changing the display of your notice)
- Using Mail Merge (Exercise 5 – Sending notice using Mail Merge)
- Using Standard Templates (Exercise 6–Create notice using standard templates)
- Word Processing in Other Languages (Exercise 7 - Creating a notice in Marathi)

Module - II: Spreadsheet and Presentation Graphics

- Overview of Excel
- Creating and Editing (Exercise 1 – Creating attendance sheet)
- Using Charts (Exercise 2 – Creating a chart)
- Managing a Workbook (Exercise 3 – Managing Attendance Sheet)
- Overview of Presentation Graphics
- Creating a Presentation (Exercise 1 – Creating a Annual Day Presentation)
- Modifying and Refining a Presentation (Exercise 2 – Modifying and Refining Presentation)
- Using Advanced Presentation Features (Exercise 3 – Advanced Features for Presentation)

Module - III: Database Management Systems

- Overview
- Creating a Database (Exercise 1 – Creating a Student Database)
- Modifying a Table (Exercise 2 – Modifying a Student Database)
- Creating Forms (Exercise 3 – Creating Form for Student Database)
- Queries and Reports (Exercise 4 – Creating Report)
- Protecting the Database (Exercise 5 – Protecting a Student Database)

Module - IV: Internet

- Internet Basics
- Navigating the Web (Exercise 1 – Navigating the web site)
- Finding Information on the Web (Exercise 2 – Searching result on the web)
- Communication Using E-Mail (Exercise 3 – Communicate result to your friends)

Module - V : Tutorials, assignments and presentation based on Module I to IV

References:

1. Microsoft Office Word 2007 a Beginners Guide: A Training Book of Microsoft Word 2007, By W.R. Mills, United States of America, Bloomington, Indiana.
2. Microsoft Office Word 2007: Illustrated Co: Illustrated Complete, By Jennifer A. Duffy, Carol M. Cram
3. Sams Teach Yourself Microsoft Office 2007 All in One, By Greg Perry
4. Microsoft Office Excel 2007: Comprehensive Concepts and Techniques, By Greg B. Shelly, Thomas J. Cashman, Jeffrey J. Quasney.
5. Microsoft Office Power Point 2007: Illustrated Introductory: Introductory, By David Beskeen
6. Microsoft Office Power Point 2007: Top 100 Simplified Tips & Tricks, By Paul McFedries.
7. Microsoft Office Access 2007: Comprehensive Concepts and Techniques, By Thomas J. Cashman, Philip J. Pratt
8. New Perspectives on Microsoft Office Access 2007, Comprehensive, Joseph J. Adamski, Kathleen T. Finnegan
9. Basic Internet, By O.H.U. Heathcote
10. Microsoft Office 2007 Power Point: A Training Book for Microsoft Power Point 2007, By W. R. Mills

VOC 103: Computer Fundamentals-I (Information Technology)

Laboratory course work

1. Experiment(s) based on word processing
2. Experiment(s) based on spread sheet
3. Experiment(s) based on presentation graphics
4. Experiment(s) based on Database Management
5. Experiments based on Internet

Rather than performing a certain prescribed number of experiments, this laboratory coursework is meant for providing sufficient hands on practice of the students with computer. However, for purpose of evaluation, at least six experiments, more or less equally divided from above listed sectors, are to be performed.

VOC 104:Professional Ethics and Management Practices

Learning Objectives:

1. Clarify personal and professional values and recognize their impact on decision making and professional behavior.
2. To appreciate ethical dilemma while discharging duties in professional life.
3. To know the need of business ethics.
4. To be aware of the need for Corporate Social Responsibility.
5. To orient students to Corporate Citizenship; thereby instilling in them Organizational Understanding, principles of Management & behavior that favor Corporate Citizenship Behavior.

Learning Outcomes:

1. Students will become aware of professional ethics and fundamentals of management practice
2. Students will acquire understanding of responsibilities of corporate sector towards the society
3. This course will improve the leadership quality in the students

Pre-requisite:

The students are expected to come prepared with the basic conceptualization & searching for relevant data through the web / References.

Module – I: Moral Values and Ethics:

Morals Values: Definition – Need for Values, Kinds of Values, Value conflicts, value clarification and value acceptance .**Ethics:** Definition and meaning, Elements/components— Autonomy, Integrity, Work ethics, Service Learning, Civic Virtue, Respect of others, Living peacefully, Caring, Sharing, Honesty, Courage, Valuing at Time, Co-operation, Commitment, Empathy, Self Confidence, Character, Spirituality.

Module – II: Profession and Ethical Practices:

Meaning of Profession: Two models of Professionalism; Three types of Ethics or morality; Ethics in different professions, Code of Professional Ethics, Implementation of Ethical code in Organization, **Ethical Practices and Issues:** Professional organization statement, positions, Barriers to ethical practices, Strategies for individuals. Ethical Decision making; Corporate Social responsibilities.

Module – III: Management Practices - Conceptualization:

Concept, Management as a function of various Social Sciences, Evolution of Management Thought, Managerial Processes, Functions, Skills & Roles of a Manager organization; Management by Objectives (MBO).

Module –IV: Individual Behavior, Group Dynamics and Social Citizenship:

Perception, Personality Types, Values & Ethics, Attitudes, Individual Learning Behaviors Individual Motivation & Work Motivation, Individual & Group Decision Making, Group Communication, Decision Making & Problem Solving, Organizational Leadership, Understanding & managing group processes, Organizational Design & Structure, Recreation & Work Stress, Corporate Social Responsibility; Social Leadership

Module -V: Tutorials, assignments and presentation based on Module I to IV

References:

1) The Professional by Subroto Bagchi
2) Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996.
3) Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.
4) Charles D. Fleddermann, "Engineering Ethics", Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint now available).
5) Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Wadsworth Thompson Leatning, United States, 2000 (Indian Reprint now available)
6) John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.
7) Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.
8) Principles of management - Suri, Sontakki and Deshpande, Mcgrow Hill publishing co. Ltd.
9) Principles of management - Dr. Davar
10) Organization and Management Practices - P. Drucker
11) Organization behavior - By Dwivedi
12) Management Principles and Practices, By Dr M. Sakunthivel Murugan; New age International Publishers, New Delhi
13) Consumer Behaviour, By Matin Khan New Age International Publishers, 2nd Edition, New Delhi
14) Fundamental of Management, Concept, Functions, Role and Profiles : By M. W. Samarth and Pratibha M. Siriya; S. Chand and Co. Ltd.
15) John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.

16) Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.

Skill Development Components

Industrial Automation

VOC 111: Analog and Digital Electronics

Learning Objectives:

1. To introduce students with basic concepts of electronics components, semiconductor devices, power supply and digital electronics
2. To introduce students with the scopes of above components/concepts in practical applications.

Learning Outcomes:

1. Students will able to understand the functioning of basic semiconductor devices, digital components.
2. Students will be able to apply the same for designing of simple applications.

Module -1: Basic Electronic Components

Basic Electronic Components - Resistor – Study of Resistor, Types of resistor, construction, and Color Coding of resistor; Capacitor - Study of capacitor, Types of capacitor and their construction; Inductor - Study of inductor & their types

Semiconductor Devices – P-N Junction Diode, Zener Diode, Light Emitting Diode, Photodiode, Transistor (CE,CB, CC modes), Phototransistor, Field Effect Transistor

Module -2: Power Supply Fundamentals

Power supply building blocks, Rectifier, Need of rectifier, Types of Rectifier, Filter and their types, Zener Diode as voltage regulator, Transistorized voltage regulator, Three terminal voltage regulator such as IC 78XX and IC 79 XX, Adjustable voltage regulator using LM-317

Module -3: Number system and Logic gates

Number System – Decimal, Binary, Octal, Hexadecimal and their conversion. Binary addition, subtractions

Logic Gates – Basic logic gates – AND, OR, NOT; Basic Circuit, Symbol, Truth table, universal gates & their truth table

Boolean Algebra – Basic Laws, De Morgan's Theorem, Conversion of Boolean expression to logic diagram, Simplification Techniques

Module – 4: Combinational Logic

Combination of Logic Gates: Converting a Boolean Expression to a Logic Diagram, Converting a Truth Table to a Boolean Expression, Converting a logic diagram to a truth table,

AND-OR logic, Minterm, OR-AND logic, Maxterm, EX-OR gate, EX-NOR Gate, NAND and NOR gate, Universal Property of NAND and NOR gate

Module – 5:

Tutorials, assignments, demonstrations and presentation based on Module I to IV

References:

1. Electronic Devices- Thomas I. Floyd; Pearson Education, Ninth Edition, 2012, New Jersey
2. Principles of Electronics- V. K. Mehta, Rohit Mehta; S. Chand Publishers, Twelfth Edition, 2008, New Delhi
3. Semiconductor Electronics – A. K. Sharma; New Age International publishers, 2001 Reprint, New Delhi
4. Electronic Principles- A. P. Malvino, D. J Bates; Mc. Graw Hill (India Pvt. Ltd), Seventh Indian Edition, 2007, New Delhi
5. Digital Fundamental- Thomas L. Floyd; Third Edition, 1987, Universal Book Stall, New Delhi/ Tenth Edition, 2008, Pearson
6. Digital Design: Principles and Practices- John F. Walkerly; Fourth Edition, Second Impression, 2009,Prentice Hall of India, New Delhi
7. Modern Digital Electronics- R. P. Jain; Fourth Edition,2010, Tata Mc. Graw Hill, New Delhi

VOC 112: Electrical Systems

Learning Objectives:

1. To introduce students with basic concepts of single and three phase AC and electrical machines.

Learning Outcomes:

1. Students will be able to perform basic circuit analysis.
2. Students will be able to understand the operation of transformers and different variants of motors.
3. Students will have basic knowledge of electricity generation through non-conventional sources.

Module -1: Basic Circuit Elements and D.C. Network Analysis

Basic Circuit Elements -Idea of Electric Potential and Current, Resistance -Unit, Law, Conductance and Conductivity, Effect Of Temperature on Resistance, Temperature Coefficient of Resistance, Ohms Law, Resistance and Parallel, Voltage Divider Rule, Short and Open Circuits, Equivalent Resistance. Inductance- Self inductance, mutually induced EMF, Capacitance – Charging & Discharging, Time Constant

D.C. Network Analysis- Introduction (Circuit, Parameters, Types of Circuits, Types of Networks, Node, Branch, loops, Mesh), Kirchoff's Volatage and Current Law, Thevenin Theorem, Norton's Theorem, Maximum Power Transfer Theorem, Delta /Star and Star /Delta Transformation.

Module -2: Electrical Fundamentals and Transformer

Single Phase AC - Generation of Alternating Voltage and Current, Equation of Alternating Voltage & Current, Simple Waveform, Complex waveform, Cycle, Time Period, Frequency, Amplitude Different form of EMF Equations, Phase, Phase Difference, Root mean Square Value(RMS) , Representation of Alternating Quantities.

Three Phase AC - Generation of Three phase voltage, Phase Sequence, Phase sequence at load, Numbering of phases, Interconnection of phases (Star and delta Connection), Concept of balance and unbalanced Load

Single Phase Transformers- Construction, Working Principle, EMF Equations, Transformation Ratio, Working of Transformer On no load and with load, losses, efficiency

Three Phase Transformers- Construction, Working Principle, Three phase transformer connections; Instrument transformers (Current and Potential transformer)

Module -3: Electric Motors

AC motors – Principle, Stator construction and operation (two and three phase), Single Phase Induction motors, Motor characteristics, Resistance-start-induction-run motor, capacitor start- induction run motor, Three phase motors, Induction motor, Synchronous motor, parameters on motor nameplate

DC motors - Principle, Basic motor Construction, Motor classifications, Significance of back e.m.f., Rotary Motion, control of field flux, Counterelectromotive force, Armature reaction, Armature torque and shaft torque, Torque and speed of a DC motor, DC motor characteristics Speed control of DC motor

Module -4: Energy Sources

Energy Sources – Renewable and non-renewable, Thermal & Nuclear Power Plant - Working principle, application, advantages & limitations, Solar & Wind Power plant – Working principle, application, advantages & limitations

Module – 5:

Tutorials, assignments, demonstrations and presentation based on Module I to IV

References:

1. Electrical Technology (Vol 1 and 2)- B.L.Thereja, A. K. Thereja; S. Chand Publishers; First multicolour edition, 2005; New Delhi
2. Network Analysis and Synthesis- Ravish R. Singh; Mc. Graw Hill Education (India) Pvt. Ltd. First Edition, 2013, New Delhi
3. Grob's Basic Electronics- M.E. Schultz; Mc.Graw Hill Pvt. Ltd., Special Indian Edition (Tenth) 2007, New Delhi
4. Industrial Electronics – Terry Bartlet; Cengage Learning India Edition, Second Indian Reprint, 2006, New Delhi
5. Non Conventional Energy Resources- B.H. Khan; Mc. Graw Hill Education, Second Edition, 2009, New Delhi

VOC 113: Industrial Electronics

Learning Objectives :-

1) To introduce students with concept of Industrial Electronic system. Why it is needed, What are various parts in it, how they work.
2) Understand classifications of various Power devices and know their construction, working principle, how they are controlled by small power, advantages, disadvantages.
3) Understand how the Power devices are used to make various industrial electronic systems like controlled rectifier, chopper, inverter etc.

Learning Outcomes :-

1) Students will acquire terminologies in Industrial electronic systems.
2) Students will be able to understand which device to be used for what applications.
3) Students will be able to understand how various industrial electronic systems work.

Module- 1: Power Electronic Devices

Introduction – Concept, Applications, Power electronic devices

Silicon Controlled Rectifiers (SCRs) – Static I-V characteristics, Switching on and off of SCR, SCR protection (Snubber circuits, overvoltage protection, overcurrent protection, gate protection), Heating, cooling and mounting

Members of Thyristor Family- LASCR, DIAC, TRIAC, ASCR, RCT; Triggering Devices- UJT, PUT

Module- 2: Turn ON and Turn OFF methods of SCR

Turn ON mechanism of SCR- High Voltage triggering, thermal triggering, Illumination triggering, dv/dt triggering Gate triggering.

Gate trigger circuits - R triggering circuit, RC triggering circuit, UJT triggering circuit (Operation, applications and limitations). Use of Pulse transformer in triggering circuit,

Turn OFF Circuits - Concept of Turn OFF / commutation mechanism of SCR through various methods

Module -3: Phase Controlled Rectifiers

Phase control – Basic concept (Firing Angle α and conduction angle θ)

Phase Control Rectifiers - Single phase half wave controlled rectifier with R, RL load, Effect of freewheeling diode; Single phase centre tapped full wave controlled rectifier with

R, RL load; Effect of freewheeling diode; Single phase Bridge type full wave controlled rectifier with R, RL load; Effect of freewheeling diode (operation and waveforms). (Basic three phase half wave uncontrolled and controlled rectifier; Need and Uses of Poly phase rectifier.
Understand need and use of Isolation transformer and Power scope.

Module - 4: Choppers & Inverters

Choppers- Fundamental Concept, basic circuit and its operation using SCR and MOSFET Step Up and Step down Chopper
Inverters- Fundamental Concept, Need of an inverter, Classification of inverters, Important applications of inverter, Working principle of Series, Parallel, bridge inverter, Performance parameters of inverter.
Block diagram and working principle of SMPS and UPS.

Module – 5:

Tutorials, assignments, demonstrations and presentation based on Module I to IV

References:

1. Power Electronics - Dr. P.S. Bhimbra, Khanna Publishers, Fifth Edition, 2014 Reprint, New Delhi
2. Power Electronics - M.D. Singh, K. Khanchandani, Tata Mc. Graw Hill Publishers, Second Edition, 2008 Third Reprint, New Delhi
3. Industrial and Power Electronics - Deodatta Shingare, Electrotech Publication, Second Edition, 2004, Pune
4. Industrial Electronics – Terry Bartlet; Cengage Learning India Edition, Second Indian Reprint, 2006, New Delhi
5. Power Electronics Circuits Devices and Applications - Muhammad H. Rashid; Prentice Hall of India; Third Edition, Seventh Impression, 2009, New Delhi
6. Power Electronics and Its Applications - Alok Jain; Penram International Publishing (India) Pvt. Ltd., Second Edition, 2004, Mumbai

VOC 114: Industrial Measurements and Instrumentation

Learning Objectives :-

1) To introduce students with concept of Instrumentation system. Why it is needed, What are various parts in it, how they work.
2) Understand classifications of various transducers and know there construction, working principle, advantages, disadvantages.
3) Understand how the transducer output is conditioned, processed, displayed and controlled.
4) Study the various systems for measurement of different physical parameters.

Learning Outcomes :-

1) Students will acquire terminologies in Instrumentation systems.
2) Students will be able to understand which transducer to be used for what applications.
3) Students will be able to understand how to select transducer for specific application.

Module - 1: Displacement and Detection Sensors

Instrumentation System- Block diagram, Function of each block
Sensors and Transducers- Definition, Needs, Classification, Selection criteria
Measurement of Linear and Angular Displacement - Linear and Angular Potentiometers, Capacitive Transducers, LVDT
Detection Sensors – Limit Switches, Proximity Detectors, Hall Effect Sensor, Photoelectric sensors, Ultrasonic Sensors

Module – 2: Temperature and Pressure Sensors

Temperature measurement - Temperature: Definition and units, Different temperature scales & their conversions; Classification of temperature measuring transducers: Gas Filled thermometer, Bimetallic thermometer, Thermistors, RTD – (PT-100) , 2 wire systems (circuit diagram only), Thermocouple – Seeback & Peltier effect, Types J, K, R , S, T(Based on material, temperature ranges)
Pressure measurement - Pressure: Definition, Types - Absolute, Gauge, Atmospheric, Vacuum (Definition, Units), Classification of Pressure measuring devices; Non elastic pressure transducer: U tube, Inclined Tube, Well type manometer; Elastic pressure transducer: Bourdon Tube, Bellows, Diaphragm, Capsule, Electronic pressure transducers- Bourdon tube with LVDT Diaphragm with Strain gauge

Module – 3 : Flow and Level Sensors

Flow measurement - Flow: Definition, Types of Flow – Laminar, turbulent , Reynolds number Classification of flow measuring transducers : Variable head flow meter- Venturimeter, orifice plate meter, Variable area flow meter – Rota meter, Electromagnetic Flow meter, Ultrasonic flow meter- Doppler Type, Solid flow measurement, Flow measurement

Level Measurement - Classification of level measurement methods: Float type – linear & rotary potentiometer (Contact type), Capacitive type (Contact type), Ultrasonic type (Non-contact type) Radiation type (Non-contact type), RADAR type (Non-contact type)

Module – 4 : Special Purpose Sensors

Humidity: Definition, unit, Types - Absolute, relative
Humidity measurement devices: Psychrometer - Dry & wet Bulb thermometer type, Hygrometer- hair type ,
Speed : Definition, unit, Classification of speed measurement methods. Photoelectric pick-up & Proximity sensor (Non contact type)
Weight: Definition, unit, Classification of weight measurement methods. Load cells.
Vibration Sensor, Thickness Sensor

Module – 5:

Tutorials, assignments, demonstrations and presentation based on Module I to IV

References:

1. Electrical and Electronic Measurements and Instrumentation - A.K.Sawhney; Dhanpat Rai & Sons.
2. Industrial Instrumentation & Control - S.K.Singh; Tata McGraw Hill Publishing Co. Ltd; 2006, Second Edition, New Delhi
3. Principles of Industrial Instrumentation - D. Patranabis; Tata McGraw Hill Publishing Co. Ltd; Third Edition, 1995, New
4. Electronics Instrumentation – H. S. Kalsi; Second Edition, 2004, Tata McGraw Hill Publishing Co. Ltd; N. Delhi
5. Industrial Electronics – Terry Bartlet; Cengage Learning India Edition, Second Indian Reprint, 2006, New Delhi
6. Mechatronics- M.D.Singh, B.Joshi; First Edition, 2006,Prentice Hall of India, New Delhi

VOC 115: Laboratory Coursework – I (IA) (Analog and Digital Electronics)

1. Study of P-N junction diode characteristics.
2. Study of characteristics of CE configuration of transistor.
3. Study of transistor as small signal amplifier (CE configuration).
4. Study of Transistor as switching device.
5. Study of SCR characteristics.
6. Study of Zener diode characteristics.
7. Study of rectifiers (half wave, full wave, bridge rectifier)
8. Study of Series and shunt Voltage regulator using transistor
9. Study of Sener diode as voltage regulator
10. Study of Voltage regulator IC-78XX & IC-79Xx
11. Study of adjustable voltage regulator using IC-317
12. Study of digital logic gates
13. Study of De'morgans theorem using logic gates
14. Study of discreet components (diodes and transistors) as logic gates
15. Study of universal logic gates NAND & NOR gates

Any six experiments should be performed from above list

VOC 116: Laboratory Coursework – II (IA) (Electrical Systems)

1. Study of Series and parallel resistive circuit
2. Study of Charging and discharging of Capacitor
3. Study of KCL and KVL
4. Study of Superposition Theorem
5. Study of Norton's Theorem
6. Study of Thevenin's Theorem
7. Study of Maximum Power Transfer Theorem
8. Study of Single Phase Transformer
9. Study of Three phase power supply configurations
10. Study of voltages and currents in passive loads in Three phase star Configuration
11. Study of voltages and currents in passive loads in Three phase star Configuration
12. Study of three phase circuits with balanced load
13. Study of three phase circuit with unbalanced load
14. Study and verify Load Characteristics of DC Shunt Motor
15. Study and verify Load Characteristics of DC Series Motor
16. Study of single Phase Induction motor
17. Study of three phase squirrel cage motor

Any six experiments should be performed from above list

VOC 117: Laboratory Coursework – III (IA) (Industrial Electronics)

1. Study of DC characteristics of SCR
2. Study of switching characteristics of SCR
3. Study of firing circuits for SCR
4. Study of SCR Commutation Techniques (Any two)
5. Study of DIAC
6. Study of TRIAC
7. Study of the effects of variation of R, C in R and RC triggering circuits on firing angle and output voltage of SCR.
8. Study of the output waveforms of single phase full wave controlled rectifier with R, RL load, freewheeling diode and measure load voltage.
9. Study of the output voltage waveform of three phase half - wave controlled rectifier with resistive load and measure load voltage.
10. Study of the effect of firing angle on output voltage in DIAC - TRIAC phase control circuit.
11. Study of the output voltage waveform of step up / step down Chopper with R, RL load and measure load voltage.
12. Study of the output voltage waveform of Series inverter with R, RL load and measure load voltage.
13. Study of the output voltage waveform of Parallel inverter with R, RL load and measure load voltage.
14. Study of the output voltage waveform of Bridge inverter with R, RL load and measure load voltage.
15. Study of Step UP/Down chopper (with SCR/MOSFET/Transistor)

Any six experiments should be performed from above list

VOC 118: Laboratory Coursework – IV (IA) (Industrial Instrumentation)

1. Study of proximity sensors
2. Study of Hall effect switch
3. Study of photoelectric sensors
4. Study of temperature of liquid using Resistance Temperature Detector (PT 100)
5. Study of temperature of liquid using thermocouple
6. Displacement measurement using LVDT
7. Weight Measurement using strain gauge transducer with cantilever setup
8. Pressure Measurement using Bourdon tube pressure gauge
9. Determine the rate of flow of liquid in pipe using orifice, ventury, Rotameter
10. Level measurement using by capacitive/float/conductive probe method
11. Observe and interpret humidity of air using wet and dry bulb Hygrometer
12. Measure speed of motor using non contact type photo electric / Inductive pick up/Tachogenerator

Any five experiments should be performed from above list

VOC 119: In-plant Training

In-plant coursework on MCC and PCC panel wiring

Automobile

VOC-121: Automobile Technology

Learning Objectives:

1. To introduce students basics of automobile and related terms.
2. To introduce students with various automobile components and working principles of them

Learning Outcomes:

1. Students will gain knowledge of automobile components, engine components.

Module I: Introduction to automobile

History of automobile, Indian and worlds leading automobile Industries, Introduction to the Components of automobile, Classification of automobile, (Two wheeler and four wheeler) engine, Clutch, gear box, differential, axle, wheel, brake, suspension, steering, electrical components, frame, body etc.

Module II: Engine and its components

Construction and working principle of I.C engine, classification of I.C engine. Construction and working of two stroke petrol engine, Construction and working of four stroke petrol engine; Difference between two stroke and four stroke engine; Petrol and diesel engine, Various rule and road signs for safety driving.

Module III: Driving Technique Technical details and vehicle

Driving hints, Driving technique Technical details and vehicle specification, engine specifications and driving safety Technical details included in owners and service manual. Work, power, energy, efficiency, bore, stroke, displacement, compression ratio, IHP, BHP.

Module IV: Basic Concept of Electricity

Current, Ampere, Volt, Resistance, Ohm law, potential difference, parallel circuit, series circuits Introduction of material. Classification, properties & uses of materials. Basic concept of electricity.

Module V: Tutorials, assignments and presentation based on Module I to IV

References:

1)Automotive Mechanics: William H. Crouse. Donald L. Anglin: Tata McGraw Hill 10th edition.

2) Automotive Electrical Equipment: P L Kolhi: Tata McGraw Hill.

3) Basic Automobile Engineering: C P Nakara: Dhanpatrai publication.

4) Automotive Mechanics: S Shrinivasan: Tata McGraw Hill Second edition

5) Automobile engineering Vol-I: Dr. Kripal Singh: Standard Publisher distributers.

6) Automobile engineering Vol-II: Dr. Kripal Singh: Standard Publisher distributers.

7) Internal Combustion Engine: V. Ganesan: Tata McGraw Hill Third edition.

8) Automobile engineering: R. B. Gupta: SatyaPrakashan

9) Automobile Engineering Vol-I: K. M. Gupta: Umesh Publication

10) Automobile Engineering Vol-II: K. M. Gupta: Umesh Publication

VOC-122: Automotive Tools and Equipments

Learning Objectives:

1. To acquaint students with general and special tools.
2. To introduce student with various equipments and Measuring tools.

Module I: Introduction of work shop, General Tools and Equipments:-

Introduction of work shop, work shop ethics, discipline, safety precaution, elementary first aid, workshop lay out, 5's' techniques. Introduction and use of various tools and equipment used in work shop.

Module II: General and Special Tools
Hammers, Chisels, Screw drivers, Torque Wrench, Adjustable wrenches, Wheel nut spanners, Punches, Pliers, Files, Spanner, Allen keys, Taps, Hacksaws, Dies, Reamers, Scrapper, Cleaning tools

Module III: Measuring and Marking Tools
Inside caliper, outside caliper, Vernier caliper (Inside/Outside), Micrometer (Inside/Outside), Height gauge, bore gauge, Compression gauge, Vacuum gauge, Try square, Feeler gauge, Tachometer, AVO meter, Surface plate, Angle plate, Scribing block, Height gauge, Dial indicator, 'V' Block etc.

Module IV: Automotive Equipments

Mechanical & Hydraulic Jack, Piston ring compressor, Piston ring expander, Stud extractor, Valve spring lifter, Tap extractor, Tyre remover, Wheel balancing Equipment, Brake testing equipment, Pullers, Filter wrench, Battery tester, Growler, Hydrometer spark plug tester, coil and condenser tester, Bench vice, Spray gun, Painting process and Tools etc.

Module V: Tutorials, assignments and presentation based on Module I to IV

Outcomes: After successful completion of course student will have knowledge about various general and special type automotive tools moreover the knowledge of measuring and marking tools used in automotive industries.

References:

1. Workshop Technology Vol-I: B. S. Raghuwanshi: DhanpatRai& Co.
2. Automobile engineering Vol-I. Dr. Kripal Singh. Standard Publisher distributers.
3. Engineering Metrology, R.K. Jain, Khanna Publisher Delhi.
4. Workshop Technology Vol- I , W.A.J. Chapman.

VOC-123: Workshop Technology

Module I: Introduction of General machineries:-

Introduction, working, Construction and use of machines: - Lathe, Milling, Shaper, Drilling, Grinding, Welding machine (Arc/Gas), Soldering and Brazing, air Compressor, Fly press, Pipe bending Machine, Wheel alignment machine, Wheel balancer Machine, F.I pump testing bench, Tyre changer Machine, Tyre inflection Machine, Decarburizing Machine.

Module II: General Purpose Machines

Lathe machine, types of Lathe machine, Construction of Lathe, Thread cutting mechanism, Accessories and attachments, Lathe operations, Taper turning, Milling machine, Milling Methods, Types of Milling machine, operations on milling machine

Module III: Special Purpose Machines

Drilling machine, Construction of drilling machine, Types of drilling machines, operations on drilling machine, Shaper machine, working principle of shaper machine, Types of shaper, operations on shaper machine, Planer machine, Working principle, Types of planer.

Module IV: Metal Joining Methods

Welding, Electrodes, Gas Welding, Oxy fuel gas welding, MIG, TIG, SAW, SMAW, Thermit welding, Electroslag welding, Types of joints, Riveting, Soldering, Brazing.

Module V: Tutorials, assignments and presentation based on Module I to IV

Learning Outcomes:

1. Students will gain knowledge about basic and heavy machine tools, manufacturing processes. They can start work in any automobile shop or industry

References:

1) Workshop Technology Vol-I: B. S. Raghuwanshi: DhanpatRai& Co.
2) Workshop Technology Vol-II: B. S. Raghuwanshi: DhanpatRai& Co.
3) Workshop Technology Vol-I: S. K. Hajra Choudhari. A. K. Hajra Choudhari. NirjharRoy :Media Promoters and Publication Pvt.Ltd.
4) Workshop Technology Vol-III: W.A.J. Chapman.

VOC 124: Engineering Drawing

Objective: The subject mainly focuses on use of drawing instruments, developing imagination and translating ideas. Developing the sense of drawing sequence and use of drawing instruments effectively.

Module I: Introduction to engineering drawing
Drawing equipments, instruments and materials, instrument types, specifications, Lines, Lettering and dimensioning, types of lines, Geometric construction, Numerals and Greek alphabets, Dimensioning methods.

Module II: Projections of point, Lines and Planes
Introduction to projection, Reference planes, orthographic projections, 1st angle and 3rd angle projection and their symbols, projections of point, projections of lines, Projections of planes, Projection of planes parallel to one of the reference planes, Projection of plane inclined to one reference plane and perpendicular to another.

Module III: Orthographic Projections
Types of projections-orthographic, perspective, isometric and oblique: concept and applications, Methods of projections, Conversion of simple pictorial views into Orthographic views, B.I.S. code of practice.

Module IV: Isometric Projections
Isometric axis, lines and planes, Isometric scales, Isometric view and isometric drawing, Difference between isometric projection and isometric drawing, isometric view from orthographic views of objects.

Module V: Tutorials, assignments and presentation based on Module I to IV

Learning Objectives: After successful completion of this course students are in position to prepare engineering drawings manually with given geometrical dimensions using prevailing drawing standards and drafting instruments.

References:
1. "Elements of Engineering Drawing" , N.D. Bhatt, Charotar Publishing House.
2. "Engineering Drawing" , P.J.Shah, S.Chand, New Delhi.
3. "Fundamentals of Engineering Drawing" , W.J.Luzzadar, Prentice-hall of India Pvt. Ltd.- New Delhi.
4. "Fundamentals of Drawing" , K.R.Gopalkrishna, Subhash Publications, Banglore.
5. "Engineering Drawing" , M.B.Shah, B.C.Rana, Pearsons.
6. "Fundamentals of Engineering Drawing" , French & Vierck, McGraw-Hill Publication.

VOC-125: Laboratory Course-I (AU) (Automobile Technology)

1) Demonstration on difference in two wheeler & four wheeler.
2) Demonstration of various automobile parts used in Two wheeler, Three wheeler, Four wheeler their basic function, construction & location etc.
3) Demonstration of various engine components their function, construction, location, material etc. Sketching of Various engine components.
4) Demonstration on working of two strokes and four stroke engine on cut section Modal (petrol & diesel engine also used of).
5) Demonstration on difference in petrol engine and diesel engine.
6) Demonstration on difference in two stroke and four stroke engine.
7) Practice on road safety and use of road sings. Draw sketching of various road sings, prepare chart of registration code.
8) Practice on driving techniques, importance of safe driving.
9) Collection of vehicle information broacher from authorized dealer and prepare chart on technical details.
10) Prepare chart of various two and four wheeler dealers available in city - Dealer name, address, contact number, manufacturer details and their various Models.
11) Study on service manual on any one automobile vehicle model.
12) Study of electrical circuit - parallel and series.
13) Practice on using various electrical measuring equipment.
14) Visit to automobile garages/ automobile industries.

At least 08practicals should be performed above list

VOC-126: Laboratory Course-II (AU)

1) Practice on health & safety - importance of safety precaution, Shoes, Dressing, safety symbol, safety equipments.(In relation with practical No.8) Practice on how to use first aid & fire extinguishers.
2) Practice on 5.s technique.
3) Demonstration on how to use various tools used in work shop, their free hand sketching.
   General tools –
   Measuring tools,
   Marking tools,
   Special tools,
4) Demonstration on how to use various Tools and equipments used in two wheeler garage , Tools and equipments used in four wheeler garage.
5) Practice on checking the battery for charging, connecting the battery for charging
6) Demonstration on painting equipments, coating and polishing.
7) Demonstration of Decarburizing Process, smoke tester, FI pump testing, car washing, hydraulic hoist, air compressor etc.
8) Visit to Garage for usage of Tools &Equipments Used in two, three and four wheeler garage. To Various automobile dealers/ authorized work shop.
   -To Automobile Industry/ Automobile components manufacturing industries.

VOC-127: Laboratory Course-III (AU)

1. Introduction to the work shop , types of work done in work shop , job opportunity (Organization chart with duties and responsibility).
2. Demonstration on various machine used in automobile industries - Compressor, Drilling, Grinding, Welding (Arc & Gas), Hand Operated & Hydraulic Operated Press, lathe, milling, shaper machine, crank shaft grinding, cylinder boring, cylinder head refacing, honing, Wheel Alignment, Tyre changer, Wheel balancing M/c.
3. Study of General Purpose machines
4. Study of Special Purpose machines
5. Two Jobs on Machining operations
6. Visit to Machining center to study various special purpose machines.

VOC-128: Laboratory Course-IV (AU)

1. Sheet based on types of lines, types of dimensioning, Numerals and Alphabets.
2. Projections of points and lines (4 problems).
3. Projection of different planes with different conditions (triangle, square / rectangular, pentagonal / hexagonal).
4. Orthographic projections of different objects. (Two problems)
5. Isometric drawings from given orthographic views (Three problems)
6. Introduction to Autocad Software.

VOC-129: In-Plant Internship / Field Work/ Project

SEMESTER – II

Semester II

General Education Components

VOC - 201: Linguistic Proficiency-II

Part - A: English

Learning Objectives:
To improve the writing skills of students

Learning Outcomes:
1. Students will be able to write formal letters
2. Presentations skill of students will improve
3. Students will be able to face interviews

Module –I: Introducing written communication

1. Writing Notices
2. Drafting Agendas (Synergy)
3. Writing minutes
4. Note taking
5. Basic of spoken English

Module-II: Writing applications, letters and business CORRESPONDENCE

(Introducing Business Correspondence):

1. Writing applications for various jobs, referring to the ads.

2. Writing letters:

   a. Letters of inquiry
   b. Letters of order
   c. Letters of complaint
   d. Letters of indent
   e. Letters of credit
   f. Bills of lading

   (Exercises from Synergy) Orient Longman

Module- III: Introducing listening skills

1. Approaches to listening skills
2. Barriers to effective listening
3. Tips for effective listening
4. Preparing for interview, Interview facing techniques
5. Preparing -
    a. Speeches
    b. Presentations
    c. Meetings
    d. Surveys
    e. Report writing
    f. Making Project reports
    g. Preparing Proposals
    h. Seeking financial assistance / loan for your proposal

References:

1) Synergy: Communication in English and study skills (Orient Blackswan) – (2008)
2) Macmillan foundation English – R. K. Dwivedi, A. Kumar: Macmillan India Ltd. 2001
3) Mastring Communication – Nicky Stanlon: Palgrave Macmillan (2009)
4) Scientists must write – Robert Barrass: Routledge Publication, London
5) Functional Grammar and Spoken and Communication in English – Bikram K. Das: Orient Longman Publication (2006)

PART-B: BASIC STRUCTURE OF THE HINDI LANGUAGE

(ON NEXT PAGE.....)

Part-B: Hindi

संप्रेषणमूलक व्यावसायिक हिंदीः

Module- IV:

वाणिज्य व्यवसाय और हिंदीः

- वाणिज्य व्यापार से तात्पर्य एंव व्यावसायिक व्यापार के साधन
- वाणिज्य व्यापार और भाषिक प्रकार्य
- वाणिज्य-व्हावसायिक संरचनात्मक विशेषताएँ
- भाषा कौशल्यः

  श्रवण, भाषण, वाचन, लेखन

व्यावसायिक - संप्रेषणः

- संप्रेषण के तात्पर्य एवं स्वरुप
- संप्रेषण के प्रमुख प्रकारः भाषिक तथा भाषेतर
- व्यावसयिक पत्राचार

क) व्यापारिक- व्हावहारिक सामाण्यपत्रा, आवेदनपत्र, यासाखपत्रा, संदर्भ तथा साखपत्रा के ऑचपत्रा, मुल्य ज्ञापनपत्र, आदेशोके निरसन सम्बंधीपत्रा, शिकायतपत्रा, समायोजनपत्र, तगादायावसूलीपत्र, विक्रय प्रतिनिधत्व संबंधीपत्र,

ख) विशेष व्यावहारिकपत्रः

-बीमातथाबीमा - पत्र

-रेल तथा जहाज द्वारा माल परिवहन से संबंधितपत्र

ग) प्रकल्प / सर्वेक्षण / प्रात्यक्षिकः

- भाषिक कौशल्य अभ्यास
- वाणिज्य - व्हावसायके भाषिक प्रकार्या कासर्वेक्षण
- व्यापरिक संप्रेषण - पत्रलेखन का अभ्यास

सहायक ग्रंथः-

१. व्यावसयिक संप्रेषणः डॉ. अनूपचंद्र मायानी, राजपाल एण्ड संस, नईदिल्ली

२. भाषाशिक्षणःसिध्दांतऔरप्रक्रिया - मनोरमागुप्त, केंद्रियहिंदीसंस्थान, आगरा

३.मीडियालेखनः सिध्दांतऔरव्यवहार - डॉ. चंद्रप्रकाश

४. व्यावसायिकहिंदी - डॉ. दिलीपसिंह, वाणीप्रकाशन, काशन, नईदिल्ली.

५. संप्रेषणमूलक व्यावसायिक हिंदी - डॉ. माधवसोनटक्केः ओरियण्ट ब्लैक स्वाईन, दिल्ली.

VOC – 202: Computer Fundamentals-II
(Basic Computer Hardware System)

Learning Objectives:

To introduce students with computer hardware system, troubleshooting techniques

Learning Outcomes:

1. Students can solve general hardware related issues
2. They can install various devices as well as operating system in the computer
3. Students can build their own computer system

Module-I:

Computer Architecture, Mother Board and its all components, Computer Components (Input/ Output Devices, Primary and Secondary Memory, Power Supply, Monitor).

Observation of all parts of Floppy drives, HDD, CD, and SMPS. Identification of cables and computers. Mounting Motherboard in cabinet, Installation of cards, devices and then connecting cables. Fitting of cabinet. CMOS – Setup, Troubleshooting.

Module-II:

Computer Assembling, Make your own Computer, Operating System Installation, Windows Vista, Software Installation, Trouble Shooting, Bios Setups, Identifications of Components. Advanced Trouble Shooting and Maintenance.

Module-III:

Types of printers and printing mechanism, How printer works, Inject printer, working of laser printer, Fonts/Type faces, Trouble shooting printers. Types of Scanners and its used.

Module-IV

Introduction to Laptops, Portable System background, System Features, Processors, Mother Boards, Memory, Power, Expansion Bus, Hard Disk & Removable Storage Devices, Laptop Components, Laptop Maintenance & Assembling, Linux, Multimedia, Internet, Computer VIRUS, Wi-Fi Network Trouble Shooting.

Module V : Tutorials, assignments and presentation based on Module I to IV

Text Books:

(01) Hardware bible By : Winn L Rosch, Techmedia publications
(02) Trouble shooting, maintaining and repairing PCs By : Stephon J Bigelow Tata McGraw Hill Publication
(03) Modern All about printers By :Manohar Lotia, Pradeep Nair, BijalLotia BPB publications.

REFERENCES:

(01) The complete PC upgrade and maintenance guide By : Mark Minasi, BPB Publications.

VOC – 203: Computer Fundamentals-II (Basic Computer Hardware System)

Laboratory Coursework

1. Handling of all Computer Peripherals
2. PC Troubleshooting
3. Windows Installation
4. PC Assembling
5. Fault finding in PC and recovering
6. Installation and use of Printers and Scanners
7. Fault Finding and Troubleshooting on Laptop

Rather than performing a certain prescribed number of experiments, this laboratory coursework is meant for providing sufficient hands on practice of the students with computer. However, for purpose of evaluation, at least six experiments, more or less equally divided from above listed sectors, are to be performed.

VOC 204: Environment Management

Learning Objectives:

1. To create awareness between the students about our ecosystem, related problemsand our role in that.
2. To encourage students to solve the environment related problems

Learning Outcomes:

1. Students will think on ecosystem and environment problems.
2. They can make other people aware about environment problems
3. They will be introduced to environmental policies a regulations

Module - I: Ecosystems and Natural Resources

Introduction: Introduction and scope of environmental science; Need of public awareness.

Ecosystem: Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems: a) Forest ecosystem b) Grassland ecosystem c) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Natural Resources: Land resources and landuse change; Land degradation, soil erosion and desertification; Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity; Water: Use and over-exploitation of surface and ground water, floods, droughts; Energy resources: Renewable and non-renewable energy sources, growing energy needs.

Module - II: Environment Pollution, Waste Management and Role of Human being

Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution, Nuclear hazards and human health risks;Case Studies: Bhopal Tragedy, Cherbonyl disaster etc.

Waste management: Control and treatment measures of urban and industrial waste; Trade in Wastes; Industrial Ecology and Recycling Industry Waste trade;

Human population growth: Impacts on environment, human health and welfare. Growth Limits. Resettlement and rehabilitation of project affected persons; case studies.

Disaster management: floods, earthquake, cyclones and landslides. Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan. Environmental ethics

Module -III: Biodiversity and Conservation

Levels of biological diversity: Genetic, species and ecosystem diversity; Biogeographic zones of India; India as a mega-biodiversity nation; Endangered and endemic species of India

Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Module- IV: Environment Policies & Practices

Fundamentals: Sustainability and sustainable development;
Urban problems: global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture; Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act;
Environment Management System: EMS Standards, ISO 19011 & ISO 14000 Series, Bharat-II and EURO- II, Eco-Audit Scheme, Clearance/ Permission for establishing Industry

Module - V : Tutorials, assignments and presentation based on Module I to IV

References:

1. Subramanian.V., "The Factories Act 1948 with Tamilnadu factories rules 1950", Madras Book Agency, 21st ed., Chennai, 2000.
2. C.RayAsfahl" Industrial Safety and Health management" Pearson Prentice Hall,2003.
3. National Safety Council, "Accident Prevention Manual for Industrial Operations", N. S. C. Chicago, 1988.
4. Heinrich H.W. "Industrial Accident Prevention" McGraw-Hill Company, New York, 1980.
5. Krishnan N.V. "Safety Management in Industry" Jaico Publishing House, Bombay, 1997.
6. John Ridley, "Safety at Work", Butterworth & Co., London, 1983.
7. Blake R.B., "Industrial Safety" Prentice Hall, Inc., New Jersey, 1973
8. Bharucha, E. 2003, Textbook for Environmental Studies, University Grants Commission, New Delhi and BharatiVidyapeeth Institute of Environmental Education and Research, Pune. 361.
9. Carson, Rachel. 1962. Silent Spring (Boston: Houghton Mifflin, 1962), Mariner Books, 2002
10. Economy, Elizabeth. 2010. The River Runs Black: The Environmental Challenge to China's Future.
11. Gadgil, M. &Ramachandra, G. 1993. *This fissured land: an ecological history of India.* Univ of California Press.
12. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
13. Grumbine, R. Edward, and Pandit, M.K. Threats from India's Himalaya dams. *Science* 339.6115 (2013): 36-37.
14. Heywood V.H. & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press.
15. McCully, P. 1996. *Silenced rivers: the ecology and politics of large dams.* Zed Books.
16. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
17. Odum, E.P., Odum, H.T. & Andrews, J. 1971. *Fundamentals of Ecology.* Philadelphia: Saunders.
18. Pepper, I.L., Gerba, C.P. &Brusseau, M.L. 2011. *Environmental and Pollution Science.* Academic press, 2011.
19. Rao MN and Datta AK, 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.

Skill Development Components

Industrial Automation

VOC 211	Interfacing and Signal Conditioning	2
VOC 212	Control Systems Fundamentals	2
VOC 213	Fundamentals of Drives	2
VOC 214	PLC Fundamentals	2
VOC 215	Laboratory Coursework – V (IA) (Interfacing and Signal Conditioning)	2
VOC 216	Laboratory Coursework– VI (IA) (Control Systems Fundamentals)	2
VOC 217	Laboratory Coursework – VII (IA) (Fundamentals of Drives)	2
VOC 218	Laboratory Coursework – VIII (IA) (PLC Fundamentals)	2
VOC 219	In-plant Training – II (IA) (Control Panel Design and Wiring)	2

Skill Development Components
Automobile

VOC 221	Automobile - V	2
VOC 222	Automobile - V	2
VOC 223	Automobile - V	2
VOC 224	Automobile - V	2
VOC 225	Laboratory Coursework – V (AU)	2
VOC 226	Laboratory Coursework– VI (AU)	2
VOC 227	Laboratory Coursework – VII (AU)	2
VOC 228	Laboratory Coursework – VIII (AU)	2
VOC 229	In-plant Training – II	2

SEMESTER – III

Semester III

General Education Components

VOC : 301 : Linguistic Proficiency - III

Learning Objectives:

To improve the presentation skills of students

Learning Outcomes

1. Students will become good English communicator
2. They can successfully present themselves in seminars, oral presentation, interviews etc.

Module- I: (1) Presentation skills:

(a) Oral Presentation
(b) Group Discussion/Panel Discussion
(c) Speech/Lecture
(d) Visual Presentation
(e) Use of Internet
(f) Seminar Presentation
(g) Commentary/ Reporting
(h) Language of Present functions
(i) Ability to answer& questions
(j) Exercise

Module- II: (2) Grammar in Use:

(a) Sentence Structure
(b) Verbs-Classifications
(c) Infinitive and gerunds
(d) Passivity
(e) Conditionals
(f) Concord
(g) Recapitulation of grammatical items
(h) Exercises

Module- III : Written Communication Skill:

(a) Forms of written communication
(b) Developing ideas and logic
(c) Correspondence Techniques

(d) Writing paragraph and complete item.
(e) Exercises
(f) Writing in different forms proposals surveys, appraisals and Reports
(g) Language and grammar required
(h) Writing article/paper/news paper/media report
(i) Exercises

Module- IV: Comparing/Conducting Programmes:

(a) Positive Attitude
(b) Language /Body Language
(c) Humour
(d) Mastering the terminology
(e) Exercises

Module- V : Tutorials, assignments and presentation based on Module I to IV

VOC 302: Business Software Tools- I : Web Page Design

Learning Objectives:

To introduce students with multimedia, World Wide Web, HTML and their applications

Learning Outcomes

Students can create and manage HTML documents

Module- I:

A. Introduction-The World Wide Web (WWW), HTML History, Hypertext and Hypertext Markup Language, Microsoft Front Page

B. HTML Documents- Dividing the document into 2 parts, Headers, Body; Tags- Format, Representing 2 types of tag (odd and even); Elements of an HTML Document -Text Elements, Tag Elements, Special Character elements

C. Structural elements of HTML documents- Header tags; Body tags- Paragraphs, Titles, Lists (Numbered lists, Non-Numbered lists, Definition lists)

D. Formatting HTML Documents- Logical styles (source code, text enhancements, variables), Physical Styles (Bold, Italic, underlined, crossed)

Module- II:

A. Managing images in html- Image format (quality, size, type, ...), Importing images (scanners), Tags used to insert images, Frames

B. Tables in HTML documents- Tags used in table definition, Tags used for border thickness Tags used for cell spacing, Tags used for table size, Dividing table with lines, Dividing lines with cells; Cell types- Titles cells, Data cells

Module- III:

A.Hypertext and Link in HTML Documents- URL/FTP/HTTP; Types of links- Internal Links, External Links, Link Tags, Links with images and buttons, Links that send email messages

B. Special effects in HTML documents- Text fonts, Sensitive Images, Tip tables; Page background- Variable, Fixed; Rotating messages (Marquee); Counters

Module- IV:

A. Multimedia- Audio files and acceptable formats (*AIFF, AU, MIDI, WAVE*), Inserting audio files; Video files and acceptable formats (*MPEG, Quick Time, Video for Windows*)- Inserting video files, Screen control attributes (*WIDTH, HEIGHT, ALIGN*), Start control sttributes (*START, FILEOPEN, LOOP, LOOPDELAY, MOUSEOVER*).

B. Managing forms- Interactive forms; Creating data entry forms; Calling JavaScripts for modifying entered data; JavaScript Primer; Handling Form Output with JavaScript; Filling out HTML forms

Module- V : Tutorials, assignments and presentation based on Module I to IV

References:

- **Special Edition Using Intranet HTML** / *Mark Surfas, Mark Brown and John Juge*
- **Dynamic HTML Web Magic** / *JefDouyer – Hayden development group*
- **HTML 4 for the World Wide Web** / *Elizabeth Castro*
- Writing HTML Tutorial by Maricopa Center for Learning and Instruction (MCLI)
- http://www.w3schools.com/html/

VOC 303: Statistical Tools: Probability and Statistics

Learning Objectives:

1. To apply the concept of probability and probability distributions in their field. To acquire the concept of estimation theory
2. To do testing of hypothesis that will be useful in solving engineering problems.
3. To design and analyze the statistical experiments.

Learning Outcomes:

Students will be able to use statistical models in various aspects of engineering, business, and analysis

Module- I: Probability and Random Variable

Probability – Random variables – Moments – Moment generating function – Standard distributions – Functions of random variables – Two-dimensional R.Vs – Correlation and Regression.

Module- II: Statistics

Collection of data, types of data, Classification and tabulation of data, Diagrammatic/ graphical representation of data, Measures of central Tendency for ungrouped data, Mean, median ,mode of ungrouped data, Brief revision of Tabulation of data, inclusive and exclusive type of tables, Histograms, frequency polygon, frequency curve, pie diagram, Ogives(Cumulative frequency graphs) Applications of ogives in determination of median, Relation between measures of central tendency, Introduction tonormal distribution, Properties of normal distribution.

Module- III: Introduction of Operation Research (OR), Origin and Development of OR, Scientific Method in OR, advantages and limitation of OR, Application of OR

Module- IV : Linear programming problems (LLP), Graphical methods, Simplex method, Transportation problem (TP), Assignment problem (AP).

Sequencing Problem (SP), Game theory, Networking Scheduling by PERT/ CPM, Replacement Problem

Module- V : Tutorials, assignments and presentation based on Module I to IV

References:

1. Richard Scheaffer, Madhuri Mulekar, James McClave, "Probability and Statistics for Engineers", Cengage Learning, USA, 2010.
2. Gupta, S.C. and Kapur, V.K." Fundamentals of Mathematical Statistics ", Sultan Chand and Sons, New Delhi, 2011.
3. Fruend John, E. and Miller, Irwin, "Probability and Statistics for Engineering ", Prentice Hall, 5th Edition, 1994.

4. Jay, L. Devore, "Probability and Statistics for Engineering and Sciences", Brooks/Cole Publishing Company Monterey, California, 1982.
5. Montgomery D.C and Johnson, L.A.," Forecasting and Time Series ", McGraw-Hill. 2005.
6. Anderson, O.D., " Time Series Analysis: Theory and practice ", I. North - Holland, Amsterdam, 1982.
7. Operation Research- K. Swarup, P. L. Gupta, M. Mohan; Sultan Chand & Son
8. Operation Research- Gupta &Kapur; Sultan Chand & Son
9. Operation Research- K. Swarup, P. L. Gupta ; Sultan Chand & Son

Skill Development Components

Industrial Automation

VOC-311: Control Systems and Drives

Learning Objectives:

1) To introduce students to the classifications of control system, controllers and complex modes
2) To make students understand the advantages and limitations of various types of control systems
3) To acquaint students of fundamental AC and DC drive modes.

Learning Outcomes :-

1) Students will acquire terminologies in control systems
2) Students will be able to understand which control system to be used for what applications.
3) Students will be able to understand how to select drive for specific application.

Module- I: Control System and Controller Modes **(10 Hours)**

Revision of basic concepts, Process, Open loop and Closed loop system, Elements of feedback control system, Block diagram description; Control System Parameters- Error, Variable Range, Control Parameter Range, Control lag, Dead Time, Cycling, Controller modes

Controller modes – Discontinuous (Two –position, Multiposition, Floating-Control), Continuous (Proportional, Integral, Derivative), Composite (Proportional-Integral (PI), Proportional Derivative (PD), Three mode Controller (PID))

Module- II: Controllers and Complex Control Modes **(12 Hours)**

Controller- Block Diagram, Types of Controllers, Self - operated controllers, Electronic Controller, Analog controller, Pneumatic controller, Hydraulic controller, Programmable Logic Controller; Tuning of controllers; Installation, Troubleshooting of controllers

Complex control- Feed forward control, Ratio control, cascade control.

Module- III: Electrical Drives – I **(13 Hours)**

Introduction-Electrical Drives, Components of electrical drives, Components of Load torques, Classification of Load Torques; Control of Electrical Drives- Modes of operation, Speed control and drive classifications, Closed-loop control (speed, torque, position), Speed sensing, Current sensing; DC Motor Drives- DC motors and their performance (revision of concepts), Starting and braking, regenerative braking, dynamic braking, plugging, speed control, variable voltage DC drives, Motor speed control, speed regulation, IR compensation, current limiting, High

speed/Low speed adjustment, Acceleration/Deceleration Adjustment, Field Current speed control, Control strategies (Single phase DC drives, Chopper drives)

Module- IV: Electrical Drives – II **(13 Hours)**

Introduction- AC drive fundamentals, AC Drive system, overview of drive controller internal circuitry, basic components of AC drive, Control Modes - Flux Vector Control, PWM control, Control panel inputs and drive functions; Induction motor drives- Induction motors (revision of concepts), Three phase induction motors- Starting, Braking, Torque – slip (speed) characteristics, Speed Control- Stator voltage control, Stator Frequency Control, Stator voltage and frequency control, stator current control, static rotor- resistance control, Slip -Power Recovery (Static Cramer Drive, Static Scherbius Drive), Synchronous motor drives. Single Phase induction motors – starting, braking, speed control- PWM Voltage Source inverter (VSI) induction motor drives, PWM VSI squirrel cage induction motor drives, CSI squirrel cage induction motor drive, linear induction motor and its control.

Module- V : Tutorials, assignments and presentation based on Module I to IV

References:

1. Power Electronics - Dr. P.S. Bhimbra, Khanna Publishers, Fifth Edition, 2014 Reprint
2. Power Electronics - M.D. Singh, K. Khanchandani, Tata Mc. Graw Hill Publishers,
3. Industrial and Power Electronics - Deodatta Shingare, Electrotech Publication, Second Edition, 2004
4. Industrial Electronics – Terry Bartlet; Cengage Learning India Edition
5. Fundamentals of Electrical Drives - Veltman André, Pulle Duco W.J., de Doncker R.W.; Springer Netherlands, 1 edition,
6. A First Course on Electrical Drives - S. K. Pillai, New Age International Publishers 2nd Edition, ISBN: 81-224-0166-X
7. Basics of Electrical Drives - S. K. Pillai, New Academic Science, 4th Edition, ISBN-13: 978-1781830116 ISBN-10: 1781830118
8. Electrical Drives - N. K. DE, P. K. SEN, Prentice Hall of India Private Limited, New Delhi, ISBN: 81-203-1492-1
9. Fundamentals of Electrical Drives - G. K. Dube, CRC Press, India 2nd Edition, ISBN: 1-84265-083-1

VOC-312: Industrial Electronics and Instrumentation

Learning Objectives:

1) To introduce students to purpose, devices and applications of power electronics
2) To make students understand the advantages and limitations of various types of control systems
3) To acquaint students of fundamental signal conditioning and DAS

Learning Outcomes:

Students will acquire terminologies in industrial electronics, sensors and DAS and apply the same towards practical applications

Module- I: Thyristors (12 Hours)

Introduction – Concept, Applications, Power electronic devices

Thyristors – Static I-V characteristics, Turn-on (High Voltage triggering, thermal triggering, Illumination triggering, dv/dt triggering Gate triggering of SCR- R triggering circuit, RC triggering circuit, Synchronized UJT triggering circuit (Operation, applications and limitations). Use of Pulse transformer in triggering circuit, Use of carrier in triggering circuit) switching behavior, thyristor ratings, (anode voltage ratings, current ratings), Turn –off methods of Thyristor (commutation mechanism and various class) , Thyristor protection (Snubber circuits, overvoltage protection, overcurrent protection, gate protection), Heating, cooling and mounting of thyristors, Heatsinks, Firing circuits for thyristors (Main features, Resistance and Resistance capacitance firing circuits, unijunction transistor), Pulse transformer

Members of Thyristor Family: PUT, SUS, SCS, Light activated Thyristor, Diac Triac, ASCR, RCT.

Module- II: Phase controlled Rectifiers, Inverters, Choppers (14 Hours)

Concept of phase control. (Firing Angle α and conduction angle Ø), Circuit diagram, working, and Waveforms of VDC of - Single phase half wave controlled rectifier with R, RL load. Effect of freewheeling diode, Single phase centre tapped full wave controlled rectifier with R, RL load. Effect of freewheeling diode, Single phase Bridge type full wave controlled rectifier with R, RL load. Effect of freewheeling diode, Basic three phase half wave uncontrolled and controlled rectifier, Need and Uses of Poly phase rectifier, Understand need and use of Isolation transformer and Power scope.

Concept of Choppers, basic circuit and its operation using SCR and MOSFET, Step Up and Step down Chopper using MOSFET basic circuits

Concept of Inverters-Need of an inverter, Classification of inverters, Important applications of inverter; Working principle of Series, Parallel, bridge inverter; Definitions of performance parameters of inverter.
Block diagram and working principle of SMPS and UPS.
Light dimmer circuit using DIAC-TRIAC.

Module- III: Industrial Sensors **(10 Hours)**

Industrial Sensors – Detection (Limit switches, proximity detectors, inductive proximity switches, capacitive proximity switches, hall-effect sensor, photoelectric sensors, methods of detection, ultrasonic sensors), Tachogenerator, Encoder, Accelerometer, Light (photovoltaic, photoconductive), Torque measurement, Tactile sensor, Flow sensors (differential, positive displacement, velocity meters, head type flow meter, mass meters, electromagnetic flow meter, rotameter, ultrasonic flow meter), lux meter, anemometer, sound level meter.

Module- III: Signal Conditioning and Data Acquisition Systems (DAS) **(13 Hours)**

Introduction to Signal Conditioning - Needs of signal conditioning; Principles of Analog Signal conditioning – Signal–Level and bias changes, linearization, conversions, Noise, filtering and impedance matching, concept of loading, Divider circuits, bridge circuits, RC filters, role of operational amplifiers in signal conditioning (review of concepts); Digital Signal Conditioning – Buses and Tri-State buffers, Converters, Comparators, Sample and Hold, decoder and encoder, Pulse modulations

Introduction to Analog and Digital DAS, Block Diagram, Components, CPU, MEMORY, I/O, Sensors, Modulation, Display, Recording, Alarm, Measurement of various physical parameters using Data Acquisitions Systems, Application examples of Data Acquisition system

Module- V: Tutorials, assignments and presentation based on Module I to IV

References:

1. Power Electronics - Dr. P.S. Bhimbra, Khanna Publishers, Fifth Edition, 2014 Reprint
2. Power Electronics - M.D. Singh, K. Khanchandani, Tata Mc. Graw Hill Publishers,
3. Industrial and Power Electronics - Deodatta Shingare, Electrotech Publication, Second Edition, 2004
4. Muhammad H. Rashid-Power Electronics-Circuits Devices and Applications; Prentice Hall of India
5. Mechatronics- M.D.Singh, B.Joshi; Prentice hall of India

6. Industrial Electronics – Terry Bartlet; Cengage Learning India Edition

7. Electronic Instrumentaion- H.S. Kalsi; Tata Mc. Graw Hill
8. A.K.Sawhney Electrical and Electronic Measurements and Instrumentation; Dhanpat Rai & Sons.
9. S.K.Singh Industrial Instrumentation & Contro; Tata McGraw Hill Publishing Co. Ltd; N. Delhi
10. D. Patranabis Principles of Industrial Instrumentation; Tata McGraw Hill Publishing Co. Ltd; N. Delhi
11. Rangan Mani Sharma Instrumentation Systems and Devices; Tata McGraw Hill Publishing Co. Ltd; N. Delhi
12. Modern Electronic Instrumentation and Measurement Techniques- A.D.Helfrick, W.D.Cooper, Prentice Hall of India
13. http://www.mccdaq.com/pdfs/anpdf/Data-Acquisition-Handbook.pdf
14. http://www.ueidaq.com/media/static/whitepapers/daqIntro.pdf
15. http://www.ni.com/white-paper/3536/en/pdf

VOC 313: Laboratory Course-V (IA)

1. Study of On/Off control system
2. Study the working of any one open loop and closed loop control system.
3. Study of Feed forward control system
4. Study of proportional control system
5. Study of Integral Control system
6. Study of Derivative Control System
7. Study of PID control system
8. Study of Ratio control system
9. Study of cascade control system
10. Application of PID control in thermal process
11. Application of PID control in flow process
12. Application of PID control in pressure process
13. Speed Control of DC series motor
14. Speed Control of DC shunt motor
15. Starting of AC motors
16. Speed control of induction motor (single phase, 3 phase)

At least 08 practicals are to be performed from the above list

VOC 314: Laboratory Course-VI (IA)

1. Study of DC characteristics of thyristor
2. Study of switching characteristics of thyristor
3. Study of firing circuits for thyristor
4. Study of phase control using thyristor
5. Study of DIAC
6. Study of TRIAC
7. Study of detection sensors (mechanical, inductive, capacitive)
8. Study of detection sensors (hall effect sensor, photoelectric sensors)
9. Study of tachogenerator
10. Study of accelerometer
11. Study of flow sensor (any two type)
12. Study of signal conditioning circuits – I
13. Study of signal conditioning circuits – II
14. Study of sample and hold circuit
15. Study of Data acquisition system

At least 08 practicals are to be performed from the above list

VOC 315 : In- Plant Internship /Field Work / Project

Skill Development Components

Travel and Tourism

VOC-321: Travel Agency & Tour operations

Learning Objectives:

To introduce the concept of Travel Agency Management & Tour Operations management

Learning Outcomes

Students will have knowledge of various tour organizations and their functions

Module – I
Origin and growth of travel agencies. Definition of Travel Agency and Tour Operations, differentiation, interrelationship.

Module –II

How to set up travel agency & tour operation business
(a) Market research, sources of funding
(b) Comparative study of various types of organization proprietorship, partnership private limited etc.
(c) Govt. rules for getting approval
(d) IATA rules, regulation for accreditation
(e) Documentation
(f) Office automation

Module – III
Organization & functions- Tour costing and packaging, Booking Procedures, Travel Vouchers, Organizing Pickup and Transfers, Sources of Income etc

Module– IV
Associations and Organizations promoting travel agencies and tour operators: IATO, TAAI, ASTA, WATA, PATA, FHRAI, UFTA

Module -V : Tutorials, assignments and presentation based on Module I to IV

Reference Books:

1. Travel Agency and Tour Operation, Concepts and Principls - J.M.S. Negi
2. Professional Travel Agency Management - Chunk, James, Dexter &Boberg
3. The Business of Travel Agency Operations and Management - D.L. Foster
4. Travel Agency Management-An Introductory Text, Anmol Publication New Delhi-MohinderChand.
5. Tourist Guide and Tour Operations, Kanishka Publication, New Delhi.

SEMESTER – IV

Semester IV

General Education Components

VOC 401: Industrial Ethics and Safety Management(for IA and AU)

Learning Objectives:

To introduce students with basic industrial ethics and safety management in industrial area

Learning Outcomes:

1. Students become acquainted with ethics that should be followed at the workplace
2. Students will be able to manage industrial safety and also able to manage control measures for industrial hazards

Module- I: Introduction to Industrial Ethics

Senses of 'Industrial Ethics'; ethical issues in engineering practice (Legal, Organizational, Individual); Importance of Ethics and moral Standards. Religion and ethics, Source of Ethics; Conflicts between business demands and professional ideals; social and ethical responsibilities; Moral dilemmas, Moral Autonomy, Kohlberg's theory, Gilligan's theory, Consensus and Controversy , Professions and Professionalism, Professional Ideals and Virtues Uses of Ethical Theories; Case studies

Module- II:Ethics at Workplace

Key factors promoting an ethical workplace, Values; Business Ethics: Scope , Need, Importance, Factors influencing Business Ethics, Ethical Theories, Morality and ethics; Management Ethics: Business Ethics and society, Society expectations from business, Values for Managers, Cultural Contradictions, Spirituality and leadership; Unethical behavior; Case studies; Codes of Professional Ethics - Conflicts of Interest, Protecting Proprietary Information, Fairness in contracting and marketing, Intellectual property and society, Resource allocation by merit/social worth/need; Theft at workplace, Proper use of assets. Whistle Blowing and beyond; Case Studies

Module- III: Introduction to Industrial Safety and Hazards

Industrial Safety

History and development of safety movement, Need for safety; Case Studies; Safety legislation: Acts and rules, Safety standards and codes; Human operator in engineering projects and industries; problems of man-machine interaction; impact of assembly line and automation; human centered technology. Accident sequence theory, Causes of accidents, Accident prevention and control techniques, Plant safety inspections, Job safety Analysis and investigation of accidents, First aid; Training for Safety: Assessment of needs. Design & development of training

programme. Training methods and strategies. Training of manager ,supervisors& workers. evaluation of training programmes; Safety Promotion & Publicity; Human behavior and safety: Behaviour as function of self and situation. Perception of danger and acceptance of risks. Knowledge and responsibility vis-a-vis safety performance. Role of management ,Supervisors and safety department in motivation.

Industrial Hazards

Industrial Noise, compensation aspects, noise exposure regulation, occupational damage, risk factors, sound measuring instruments, noise networks, noise surveys, noise control program, industrial audiometry, hearing conservation programs; vibration, types, effects, instruments, surveying procedure, permissible exposure limit.
Ionizing radiation, types, effects, monitoring instruments, control programs, OSHA standard-non-ionizing radiations, effects, types, radar hazards, microwaves and radio- waves, lasers, TLV-cold environments, hypothermia, wind chill index,
Recognition of chemical hazards-dust, fumes, mist, vapour, fog, gases, types, concentration; Sampling methodology, Air Sampling instruments, Types, Measurement Procedures, Instruments Procedures, Gas and Vapour monitors, dust sample collection devices, personal sampling Factors contributing towards fire. Chemistry of fire. Classification of fires. Common causes of industrial fires.

Module- IV: Control measures for Industrial Hazards

Lighting and safety. Principles of good illumination, Recommended minimum standards of illumination; Purpose of ventilation, Classification of Ventilation as General Ventilation (Natural and Mechanical modes), Local Exhaust Ventilation; Special methods for Thermal Stress control such as Air conditioning, Radiant Heat Control. Engineering Control of noise, Vibration damping, Noise isolation, Noise absorption. Silencers. Vibration: Measurement and control. Dangers from electricity. Safe limits of amperages, Voltages Safe distance from lines, Capacity and protection of conductors, Joints and connections, Means of cutting of power overload and short circuit protection. Earth fault protection. Earth insulation and continuity tests. Protection against overvoltage. Control of hazards due to static electricity; Statutory provisions regarding fire safety. Determination of fire load. Fire resistance of building materials. Design of building plant, exits, etc. for fire safety. Prevention of fire. Portable extinguishers. Water systems, carbon-di-oxide systems. Foam extinguisher system. Dry chemical extinguishing system. Industrial fire detection and alarms. Sprinkle systems.

Module- V : Tutorials, assignments and presentation based on Module I to IV

REFERENCES:

1. R.K.Jain and Sunil S.Rao , Industrial Safety, Health and Environment Management Systems, Khanna publishers , New Delhi (2006)
2. Slote.L.Handbook of Occupational Safety and Health, John Willey and Sons, NewYork .

3. Frank P. Lees, Loss of prevention in Process Industries , Vol. I and 2, Butterworth-Heinemann Ltd., London (1991).
4. Industrial Safety -National Safety Council of India.
5. The Factories Act with amendments 1987, Govt. of India Publications DGFASLI, Mumbai
6. Grimaldi and Simonds , Safety Management, AITBS Publishers , New Delhi (2001)
7. Industrial Safety and pollution control handbook: National Safety Council and Associate publishers Pvt. Ltd, Hyderabad(1993).
8. Handbook of Environmental Health and Safety: Herman Koren and Michel Bisesi, Jaico Publishing House, Delhi (1999).
9. Handbook of Environmental Risk Assessment and Management: Peter Calow, Blackwell Science Ltd. USA (1998).
10. Risk Assessment and Environmental Management: D. Kofi Asvite-Dualy, John Willey & Sons, West Sussex, England (1998).
11. Introduction to Environmental Engineering &Science:Gilbert M. M., Pearson Education, Singapore (2004).
12. Safety A personal Focus David L Bever
13. Fire Equipment David L. Bever
14. Industrial Safety National Safety Council of India
15. Engineering Chemistry, Jain & Jain
16. Industrial Management Jain &Bawa
17. Hand book of Hazardous Air pollutions, Dennis P Nolan P.E
18. Remediation and Treatment Technologies. Dennis P Nolan P.E
19. Fire Technology, R.S. Gupta
20. Major hazard control, Inter National Labor Office
21. Encyclopedia of occupational health and safety, Inter National Labor Office
22. Safety, health and working condition in the transfer of technology, Inter National Labor Office
23. Radiation protection, Inter National Labor Office
24. Fire service Manual (4 volumes)
25. Charles D Fleddermann, "Engineering Ethics", Prentice Hall, New Mexico, 1999.
26.John R Boatright, "Ethics and the Conduct of Business", Pearson Education, 2003
27.Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, 2001.
28.Prof. (Col) P S Bajaj and Dr. Raj Agrawal, "Business Ethics – An Indian Perspective", Biztantra, New Delhi, 2004.
29.David Ermann and Michele S Shauf, "Computers, Ethics and Society", Oxford University Press, (2003)
30. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill, New York, 2005.
31.Charles E Harris, Michael S Pritchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Thompson Learning, 2000.

VOC- 401 : Ethical, Legal and Regulatory Aspects of Tourism (TT)

Learning Objectives:

To aware students about ethical, legal aspects of tourism

Learning Outcomes

Students will able to follow ethical aspects of tourism, they become aware of the laws related to accommodation, laws designed for adventure tour. Also they will able to follow safety measure in tours.

Module I: Ethics in Tourism

Defining ethics and its significance in tourism. Principles and practices in business ethics. Business compulsions, motivation and ethical parameters.

Module II: Regulatory Aspects - I

Laws relating to accommodation, travels agencies land tour operation sector, Lawland regulations related to airlines and airways, laws related to surface transport; DGCA formalities for business and recreational flying in India; Special permits to restricted areas for foreign tourist in India, restricted area in India for foreign tourists and related authorities at these places to obtain permits; permits related to various monasteries and wild life areas.

Module III: Regulatory Aspects - II

Law designed for Adventure Tour operation, special permits for rafting, paragliding, helisking and angling. Peak booking formalities, IMF rules for mountain expeditions, cancellation of permits and bookings;

Travel Insurance and consumer protection act, International consumer protection actsin tourism, Evacuation and International insurance business, foreigners act, passportact and visa extension. Ancient Monument Act, RTI, Laws related to environmentand wildlife.

Module IV: Safety in Tourism

Safety and security of tourist, Tourist Police, place of Tourism in the constitution, need of tourism legislation.

Module V : Tutorials, assignments and presentation based on Module I to IV

Text Books:

1. Tourism Guide lines published by Govt. of India, Ministry of Tourism.
2. Tourism guidelines issued by Department of Tourism for hotel and restaurant operation.

Additional References :

1. Sajnani Manohar (1999) Indian Tourism Business : A Legal Perspective, NewDelhi.
2. R. K. Malhotra (2005) Socio – Environmental and Legal Issues in Tourism,New Delhi.
3. Gupta S.K. (1989) Foreign Exchange Laws and Practice, Taxman Publications, Delhi.

VOC- 402: Business Software Tools

Learning Objectives:

To learn students various business software tools

Learning Outcomes

Students will able to use softwares such as CSS, photoshop, dreamware, flash; as per their application(s)

Module I: CSS and Photoshop

Introduction to CSS: Concept of CSS, Creating Style Sheet, CSS Properties, divs and spans, ids and classes, CSS Styling, Working with block elements and objects, Working with Lists and Tables, internal CSS declarations, CSS formatting and alignment

CSS Advanced: CSS color, Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Image Sprites, Attribute sector, Creating page Layout and Site Designs, Embedded audio files

Module II: Dreamweaver and Flash

Introduction to Photoshop: Creating new files, Resizing images, Image transformations, Levels & Color Balance, Cropping, The Ruler Tool, Zooming, History Panel, Saving & file formats.

Photoshop Advance: Selections, Extracting regions of an image, Combining images (basic), Introduction to layers, Layer styles, History panel, Setting up your workspace, Frames & Objects, Working with text, Text formatting, Paragraph formatting, Linked text frames.

Dreamweaver: Dreamweaver basics, Setting up your workspace, Site management, Text formatting, Images & Media, Links, styles, Inserting Tables, Adding Frames, Rollovers,Putting it all together

Flash basics: Introduction to the Flash IDE, Creating a new project, Drawing simple vector shapes, Lines & Fills, Colors, Shape Tweens, Layers

Flash advance: Review symbols and instances, Review internal timelines, 3D rotation tool, Mask layers, Deco Brush, Custom mouse pointers

Module III: Management System

Content Management System

Introduction of CMS is Web Development, Configuring a domain name and web hosting, Exploring CMS terminology, including open source, PHP, server-side, client side, Static HTML website, how CMS web pages are generated, Website strategy and planning, site mapping, content planning, Introduction of Joomla, Adding and displaying menus in Joomla, Linking menus to articles and other features Joomla

Information Management System (IMS)

Introduction to IMS, IMS DB Structure, DL/I processing, PSB, PCB,QUALIFIED SSA, UNQUALIFIED SSA, Multi positioning, GSAM datasets, Checkpoints ,Restart, Secondary Indexing

Module IV: Payroll System

Introduction to Payroll, The Payroll System, Batch and Real-Time Processing Methods, Interfaces, Control Procedures, External, Audits, Paying Employees, Taxes for Employee, The Need For Payroll And Personnel Records, Analyzing And Journalizing Payroll Transactions

Module V : Tutorials, assignments and presentation based on Module I to IV

VOC 403: Fundamentals of Business and Accounting

Learning Objective:
The course aims to provide basic concepts and knowledge of a business enterprise and with the basic accounting principles and techniques of preparing and presenting the accounts for user of accounting information.

Learning Outcomes:
Students will get knowledge of fundamentals of business, basic accounting terms, financial accounting etc. This will help them if they start their business in any field

Module- I : Introduction to Business

Concept, Nature and Scope of Business Enterprise; Concept of Business as a System; Business and Environment Interface; Entrepreneurial opportunities in contemporary business environment or emerging trends in business: Networking marketing, Franchising, Business Process Outsourcing, knowledge Process Outsourcing, Ecommerce and M-Commerce. Opportunity and Idea Generation - role of Creativity and Innovation. Feasibility study and preparation of Business Plan Basic considerations in setting up a Business Enterprise. Process of setting up a Business Enterprise.

Module- II : Introduction to Financial Accounting

Accounting-An Introduction: Business transactions, Book-keeping, Accounting and its branches. Nature, functions and objectives of Financial Accounting. Accounting Assumptions-Accounting Concepts: Meaning, concepts: Matching, Accrual, Realisation and Dual Aspect Concept.

Module- III: Accounting Terms, Accounting Equation and Journal

Accounting Terms-Accounting Equation Need of Accounting equation, Meaning and preparation of Accounting equation. Rules of Accounting -Journal Meaning, classification of journal into General journal and special journals (with examples). Incorporation of journal entries involving different accounts. Cash Book Meaning, types-Simple Cash Book, Two column Cash Book and Three column Cash Book.

Module- IV : Voucher Approach in Accounting and Financial Statements

Vouchers and their preparation - Day Book and Subsidiary Day Books -Recording the vouchers into Day Books -Recording the Vouchers into Subsidiary Day Books -Ledger Posting of Day Book -Posting of Subsidiary Day -Trial Balance -Errors and their Rectification .

Capital and Revenue - Preparation of Trading and Profit and Loss Account and Balance Sheet - Preparation of Trading and Profit and Loss A/c and Balance Sheet (with adjustments).

Module- V : Tutorials, assignments and presentation based on Module I to IV

References:

1. Anthony, R.N., and J.S. Reece, *"Accounting Principles"*, Richard D. Irwin, Inc.
2. Monga, j.R., *"Financial Accounting: Concepts and Applications"*, Mayoor Paper Backs, New Delhi.
3. Shukla, M.C., T.S. Grewal and S.C.Gupta, *"Advanced Accounts"*, Vol-I, S.Chand& Co., New Delhi.
4. Gupta, R.L. and M. Radhaswamy, *"Advanced Accountancy"*, Vol-I, Sultan Chand & Sons, New Delhi.
5. Maheshwari, S.N. and. S. K. Maheshwari, *"Financial Accounting"*, Vikas Publishing House, N ew Delhi.
6. Tulsian, P.C., *" Advanced Accounting"*, Tata Me Graw Hill, New Delhi.
7. *"Compendium of Statements and Standards of Accounting"*, The Institute of C hartered Accountants of India, New Delhi.

VOC 413 :Laboratory Course – VII (IA)

i. To write program for studying data movement operations in Atmel 89C51 trainer kit
ii. To write program for studying logical operations in Atmel 89C51 trainer kit
iii. To write program for studying mathematical operations in Atmel 89C51 trainer kit
iv. To write a program and implement for interfacing Atmel 89C51 to blink LED.
v. To write a program and implement for interfacing Atmel 89C51 to interface a switch and 'n' LEDs to make the controller operate as a counter
vi. To write a program and implement for interfacing Atmel 89C51 to a DAC for generation of square and triangular waveforms
vii. To write a program and implement for interfacing Atmel 89C51 to 2X8 LCD module
viii. To write a program and implement for interfacing Atmel 89C51 to ADC for reading of voltage in 2X8 LCD module
ix. To write a program and implement for interfacing Atmel 89C51 to stepper motor
x. To write a program and implement for interfacing Atmel 89C51 to control stepper motor direction using SPDT switch
xi. To write a program and implement for interfacing Atmel 89C51 to control DC motor direction withSPDT switch
xii. Study and use of ladder programming by PLC
xiii. Study and use of L (Latch) and U (Unlatch), timer, counter
xiv. PLC ladder programming with Simulator (relay, logical, program control instructions)
xv. PLC ladder programming with Simulator (Data control instructions, PLC arithmetic instructions, File manipulation instructions, file transfer operation)
xvi. PLC ladder programming with Simulator (Timer Instruction, Counter Instruction, Sequencer Instruction, Shift Register)
xvii. PLC ladder programming with Simulator (door control, Simulator traffic light control, Conveyor belt control, Water tank filling, Bottle filling. Robotic hand)
xviii. PLC programming for working model of conveyor
xix. PLC programming for working model of water level control
xx. PLC programming for working model of traffic light

At least 08 practicals should be performed from above list

VOC 414 :Laboratory Course – VIII (1A)

i. Study of Fundamental hydraulic principle(s)
ii. Study of Pressure relief and reducing valve
iii. Study of Directional control valve
iv. Study of single acting cylinder
v. Study of double acting cylinder
vi. Study of pressure reducing valve
vii. Study of diaphragm type accumulator
viii. Study of Hydraulic motor (gear)
ix. Study of Air filter, lubricator and regulator
x. Study of manifold block
xi. Study of 2/2 way DC valve
xii. Study of single acting cylinder
xiii. Study of double acting cylinder
xiv. Study of 5/2 way valve
xv. Study of 4/2 way DC valve
xvi. Study of 5/3 way mid position closed valve
xvii. Study of 5/2 way double pilot valve air operated with manual over ride
xviii. Study of one way flow control valve
xix. Study of quick exhaust valve
xx. Study of vacuum generator
xxi. Study of 5/2 way valve (solenoid operated)

At least 08 practicals should be performed from above list

VOC 415 :In-plant Internship / Field Work / Project

VOC- 503: Business Communication

Learning Objectives: To acquaint students about practices in advance business communication

Learning Outcomes: Student will acquire effective skills for advance level business practices

Module- I: Introduction **(2 Hours)**

Meaning & Definition, Classification, Role; Characteristics of successful communication – Importance of communication in business – Communication structure in organization – Communication in conflict resolution - Communication in 31 crisis. Communication and negotiation. Communication in a cross-cultural setting. Personality and Emotion interference.

Module- II: Writing Skill and Case Analysis **(6 Hours)**

Principles of effective writing – Approaching the writing process systematically: The 3X3 writing process for business communication: Pre writing – Writing – Revising – Specific writing features – Coherence – Electronic writing process. Writing routine and persuasive letters – Positive and Negative messages Writing Reports, Writing memos

Different types of cases – Difficulties and overcoming the difficulties of the case method – Reading a case properly (previewing, skimming, reading, scanning) – Case analysis approaches (Systems, Behavioural, Decision, Strategy) – Analyzing the case – Dos and don'ts for case preparation – Discussing and Presenting a Case Study

Module- III: Employment Communication and Negotiation **(6 Hours)**

Introduction – Composing Application Messages - Writing CVs – Group discussions – Interview skills Impact of Technological Advancement on Business Communication – Technology-enabled Communication - Communication networks – Intranet – Internet – e mails – SMS – teleconferencing – videoconferencing

Negotiation – Nature and need for negotiation – Factors affecting negotiation – Stages of negotiation process – Negotiation strategies

Module- IV: Group Communication **(8 Hours)**

Meetings – Planning meetings – objectives – participants – timing – venue of meetings – leading meetings. Meeting Documentation: Notice, Agenda, Resolution & Minutes. Seminars – workshop – conferences Media management – The press release – Press conference – Media interviews Etiquette Advantage in Business Communication

Module- V : Tutorials, assignments and presentation based on Module I to IV

References :

1. Business Communication : Concepts, Cases And Applications – Chaturvedi P. D, & Mukesh Chaturvedi ,2/e, Pearson Education, 2011
2. Business Communication: Process And Product – Mary Ellen Guffey, 3/e, Cengage Learning, 2002.
3. Communication – Rayudu C. S, Himalaya Publishing House
4. Business Communication – Lesikar, Flatley, Rentz & Pande, 11/e, TMH, 2010
5. Advanced Business Communication – Penrose, Rasberry, Myers, 5/e, Cengage Learning, 2004
6. BCOM – Lehman, DuFrene, Sinha, Cengage Learning, 2/e 2012
7. Business Communiacation – Madhukar R. K, 2/e, Vikas Publishing House.
8. Effective Technical Communication - Ashraf Rizvi M, TMH, 2005.
9. Business Communication - Sehgal M. K & Khetrapal V, Excel Books.
10. Business Communication – Krizan, Merrier, Jones, 8/e, Cengage Learning, 2012.
11. Basic Business Communiaction – Raj Kumar, Excel Books, 2010

VOC 504: PRODUCT COSTING

Learning Objective: To enable the students to understand the basic aspects of the design process and to apply them in practice. Also to train the student in the concept of product costing and other manufacturing economics in optimization of product design.

Learning Outcome: Students will be able to draft efficient planning towards market research and accordingly effect designing and product costing

Module I: Product Design and Development **(6 Hours)**

Principles of creativity in design- integrated product development Product analysis – Criteria for product design – Market research – Design for customer and design for manufacture – Product life cycle.

Module II: Economics of Design **(6 Hours)**

Breaks even point - Selection of optimal materials and processes – Material layout planning – Value analysis – Re-engineering and its impact on product development.

Module III: Product Modelling **(6 Hours)**

Product modeling – Definition of concept - fundamental issues – Role and basic requirement of process chains and product models –Types of product models – model standardization efforts – types of process chains – industrial demands.

Module IV: Product Costing **(8 Hours)**

Bill of materials – Outline Process charts – Concepts of operational standard time - Work measurement by analytical estimation and synthesis of time – Budgets times – Labor cost and material cost at every stage of manufacture – W.I.P. costing –

Concept of per hour machine rate or per shift rate for machine & its calculation- Concept of overheads, profit margin;
Concept of quotation & tender- How to prepare quotation, rate calculation & decide other terms & conditions in quotation.

Module- V : Tutorials, assignments and presentation based on Module I to IV

References:

1. SAMEUL EILON, "Elements of Production Planning and Control", McMillan and Company, 1962.
2. JONES S.W., "Product Dosing and Process Selection", Butterworth Publications, 1973.
3. KARL T. ULRICH, Stephen D. Eppinger, "Product Design and Development", McGraw-Hill, 1994.

4. HARRY NYSTROM, "Creativity and Innovation", John Wiley & Sons, 1979
5. GEORGE E. DIETER, "Engineering Design – Materials and process approach", Tata McGraw-Hill, 1991
6. DONALD E. CARTER, "Concurrent Engineering", Addison Wesley, 1992.

Skill Development Components

Industrial Automation

VOC 511: Embedded Systems and PLCs-II

Learning Objectives: (i) To introduce students to PIC microcontroller, its programming and interfacing to real world devices

(ii) To introduce students advance PLC functions, analog operations and interfacing of PLC to real world devices and processes

Learning Outcomes: (i) Students will acquire fundamental knowledge about programming and interfacing of PIC microcontrollers

(ii) Students will be able to apply PLCs for industrial applications

Module – I: Introduction to PIC Microcontrollers, Assembly Language Programming, Instruction Set **(12 Hours)**

Introduction to PIC microcontrollers, PIC architecture and Assembly Language Programming, Branch, Call and Time Delay Loop, I/O port programming, Arithmatic and logic instructions, Bank Switching, Table Processing

Module – II: PIC Hardware Aspects and Interfacing **(12 Hours)**

PIC 18F Hardware connections, PIC18 timer programming; Interfacing- LED, buzzer, LCD, Keyboard, ADC, DAC, Sensor, Relay, Optoisolators, Stepper motor, DC motor

Module – III: PLC Functions **(12 Hours)**

PLC Number comparison and conversion functions, PLC SKIP and MASTER CONTROL RELAY Functions, Jump Functions, PLC Data Move Systems, PLC Digital Bit functions with applications, PLC sequencer functions

Module – IV: Advance PLC Functions **(15 Hours)**

Analog PLC operation, controlling a robot with a PLC, Motor Controls, PLC installation, system integrity, troubleshooting and maintenance; Factors to consider in selecting a PLC for Industrial Process; Applications (Batch Process Control, Density based traffic light control, conveyor belt control, linear bottle filling, rotary bottle filling, STAR DELTA automatic changeover connection for induction motor)

Module- V : Tutorials, assignments and presentation based on Module I to IV

References:

1. PIC microcontrollers and embedded systems- M.A. Mazidi, R. D. Mc. Kinlay, C, Causy; Pearsn, 2008, fourteenth impression
2. BASIC for PIC microcontrollers- N. Matic; webmaster, 2001
3. Programmable Logic Controllers: Programming Methods and applications – J.R. Hackworth, F.D. Hackworth Jr; PEARSON; 5th edition 2003
4. Industrial Electronics: Circuits, Instruments and Control Techniques- T. Bartlett; CENGAGE Learning; 2006
5. Programmable Logic Controllers: Principles and applications- J. W. Webb, R.A. Reis; 5th edition, 2013

VOC- 512 : Manufacturing Processes and Mechatronics

Learning Objectives: (i) To introduce students to the fundamental manufacturing processes pertaining to common industrial and workshop practice

(ii) To introduce students to the CNC technology

Learning Outcomes: (i) Students will acquire fundamental knowledge about industrial manufacturing processes

(ii) Students will become familiar to CNC terminologies, structural aspects of CNC machine and basic functioning of CNC machines

Module- I: Forming and Casting Processes **(12 Hours)**

Drop Forging – Upset forging, Press Forging, Open and Closed Die forging, Forging Operations

Rolling- Principle, Hot and Cold Rolling, Types of Rolling Mill

Extrusion – Direct and Indirect extrusion, Advantages and Disadvantages

Pattern Making – Basic Steps in casting making, Pattern – Types, Materials, Allowances, Tools, Colour Coding Press Forging, Open and Closed Die forging, Forging Operations

Rolling- Principle, Hot and Cold Rolling, Types of Rolling Mill

Extrusion – Direct and Indirect extrusion, Advantages and Disadvantages

Module- II: Machining Operations and Welding **(14 Hours)**

Lathe Machine – Introduction, Classification and basic parts of central lathe-their functions, Lathe operations- facing, plain turning, Taper turning, Thread cutting, Chamfering, Grooving; Cutting tools, Cutting Parameters; Threading & tapping.

Drilling Machine – Introduction, Classification, Basic parts of radial drilling machine and their functions, Twist drill nomenclature, Drilling Machine Operations – Drilling, Reaming, Boring, Counter Sinking, Counter Boring; Cutting parameters

Welding – Introduction and classification of welding processes; Gas welding, carbon arc welding, Shielded metal arc welding, TIG welding, MIG welding, Resistance welding, Laser beam welding, welding defects

Module- III: Modern CNC machines - Introduction, Design and Mechatronic Elements (14 Hours)

Introduction to the term mechatronics, Introduction to modern CNC machines, CNC machining centre developments, turning centre developments, tool monitoring on CNC machines

Basic CNC machine structure, Guideways, Feed drives, Spindle, Measuring Systems, Controls, software, User interface, Gauging, Tool monitoring system

Module- IV: CNC Machines – Drives, electricals and system configuration (14 Hours)

Drives- Spindle and Feed drive, Servo principle, Driver optimization, Drive protection, Selection criteria for AC drives, Electric elements and wiring, Power supply requirements, Electrical standard, electrical panel cooling

CNC system configuration, Interfacing, Monitoring, Diagnostics, nachine Data, Compensations, Direct Numeric control (DMC)

Module V : Tutorials, assignments and presentation based on Module I to IV

References:

1. A Text Book of Manufacturing Processes – S.L. Gavhale, S.S. Agarwal, First edition, 2013
2. Manufacturing Engineering & Technology - Serope Kalpakjian, Steven Schmid, Seventh Edition, 2013
3. Workshop Technology (Part I, II,II) - W.A.J. Chapman, CBS (eds. 5th, 2001; 4th 2007, 3rd 1995)
4. Processes and Materials of Manufacture - Roy. A. Lindberg, , PHI / Pearson Education, 2006
5. Elements of Workshop Technology (Volume I and II) - S.K Hajra Choudhury and A.K., Hajra Choudhury., Media Promoters and Publishers Private Limited, Mumbai, 1997.
6. Manufacturing Technology Foundry, Forming and Welding- P.N. Rao, , Tata McGraw Hill Publishing Company Limited, 2nd edition, 2003
7. Manufacturing Technology - S. Gowri, P. Hariharan, A. Suresh Babu; Pearson Education, 2008.
8. Mechatronics- HMT Limited; Tata McGraw Hill Publishing Company Limited; First Edition, Twelfth Reprint 2005.

VOC 513 - Laboratory Course –IX

i. To write program for studying data movement operations with PIC microconroller
ii. To write program for studying logical operations with PIC microconroller
iii. To write program for studying mathematical operations with PIC microconroller
iv. To write a program and implement for interfacing PIC microcontroller to blink LED.
v. To write a program and implement for interfacing PIC microcontroller to a switch and 'n' LEDs to make the controller operate as a counter
vi. To write a program and implement for interfacing PIC microcontroller to a DAC for generation of square and triangular waveforms
vii. To write a program and implement for interfacing PIC microcontroller to 2X8 LCD module
viii. To write a program and implement for interfacing PIC microcontroller to ADC for reading of voltage in 2X8 LCD module
ix. To write a program and implement for interfacing PIC microcontroller to stepper motor
x. To write a program and implement for interfacing PIC microcontroller to control stepper motor direction using SPDT switch
xi. To write a program and implement for interfacing PIC microcontroller to control DC motor direction with SPDT switch
xii. Study and use of ladder programming by PLC
xiii. Study and use of L (Latch) and U (Unlatch), timer, counter
xiv. PLC ladder programming with Simulator (relay, logical, program control instructions)
xv. PLC ladder programming with Simulator (Data control instructions, PLC arithmetic instructions, File manipulation instructions, file transfer operation)
xvi. PLC ladder programming with Simulator (Timer Instruction, Counter Instruction, Sequencer Instruction, Shift Register)
xvii. PLC ladder programming with Simulator (door control, Simulator traffic light control, Conveyor belt control, Water tank filling, Bottle filling. Robotic hand)
xviii. PLC programming for working model of conveyor
xix. PLC programming for working model of water level control
xx. DC Motor On/Off, Forward /reverse through PLC.
xxi. Connecting different Analog and Digital sensors to PLC.
xxii. STAR DELTA automatic changeover connection for induction motor using PLC programming.
xxiii. Making a selector of available push button by using PLC instructions.

xxiv. Industrial metal cutting application using PLC.
xxv. Traffic light signal on PLC
xxvi. Railway gate barrier automatic open and close using PLC
(Making hardwire connections for all above mentioned practical.)
xxvii. Demonstration of various manufacturing process through industry orientation/ training
xxviii. Demonstartion of various types of CNC machines through industry orientation/training

At least 10 practicals should be performed from above list

VOC 514 - Major Project (Phase – I)

VOC 515 - In-plant Internship/Field Work/ Project

Skill Development Components

Travel and Tourism

PAPER – VOC-521: Entrepreneurship in Tourism

Learning Objectives–

To introduce the concept of entrepreneurship in tourism with a view to encourage the learners to starting their own business enterprises.

Learning Outcomes

Students will be in platform to start their entreprencurship in tourism.

Module – I

Entrepreneurship: Definition role and expectation. Entrepreneurial motivations, types. Entrepreneurship opportunities in tourism. Entrepreneurial skills for travel, tourism and hospitality trade,

Entrepreneurial Process: Identification of an Opportunity, Market Assessment, Analyzing Competitive Situation, Understanding Trade Practices, Resource Mobilization

Module – II

Government Police: tourism enterprises/units eligible for assistance under Ministry of Tourism scheme and Maharashtra Tourism Policy Schemes

Module-III

Financing of Enterprises

Module – IV

Ownership Structure and Types, Selection of an appropriate form of ownership structure

Module V : Tutorials, assignments and presentation based on Module I to IV

References:

1. Vasant Desai, Entrepreneurship & Small Business Management
2. Peter Drucker, Innovation & Entrepreneurship
3. S S Khanna, Entrepreneurial Development
4. C B Gupta, N P Srinivasan, Entrepreneurial Development

5. D N Mishra, Entrepreneur and Entrepreneur Development &Planning in India

PAPER – VOC-522: Contemporary Issues in Tourism

Learning Objective:

To provide knowledge about the new trends in tourism and the environment of travel business

Learning Outcomes

Students will get thorough knowledge of contemporary issues in tourism. They can consider these issues and plan their tours accordingly

Module– I

Socio political happenings, political instability, regionalism, and national integration. Climate change and other environmental issues. Terrorism and tourism: safety and security issues in tourism

Module – II

Economical crises and its impacts on tourism. GATS: concept and its implication on Indian Tourism scenario

Module -III

Legal issues. Taxation: present scenario and future challenges, foreign exchange

Module – IV

STZ: features, operations and implications. Merger, acquisition of tourism enterprises

Emerging patterns in travel and tourism

Module V : Tutorials, assignments and presentation based on Module I to IV

References:

All current articles, news items in the magazines, news papers, electronic media etc.

PAPER – VOC-523: Laboratory Course- IX / Assignments

This paper includes assignments such as field work, seminar, practical training, report writing, review of literature or any other innovative practices. The course would specially focus on field visits to different tourism products in the region.

PAPER – VOC-524: Major Project (Phase – I)

Skill Development Components

Automobile

VOC 531 :

VOC 532 :

VOC 533 :Laboratory Course - IX

VOC 534 :Major Project- Phase- I

VOC 535 :In-plant Internship / Field Work

SEMESTER – VI

Semester VI

General Education Components

VOC 601- Human Resource Management

VOC 602- Entrepreneurship Development

VOC 603- Workshop Management (for Industrial Automation and Automobile) / Outdoor Management (for Travel & Tourism)

Skill Development Components

Industrial Automation

VOC 611 - Voc-XI (Motion Control and Robotics)

VOC 612 - Voc-XII (Process Control and Tools)

VOC 613 - Laboratory Course –X

VOC 614 - Major Project (Phase – II)

VOC 615 - In-plant Internship/Field Work/ Project

Skill Development Components

Travel and Tourism

PAPER – VOC-621: Tourism Policy & Planning

Learning Objectives –

To introduce the various aspects of tourism planning.

Learning Outcomes

Students can successfully do professional tour planning

Module – I
Importance & Planning process. Planning of Tourism for the development of Economy.

Module – II
Major Committees and their perspective on Tourism Planning. L.K. Jha Committee, (1982), National Committee on Tourism Report (1988),

Module– III
National Action Plan (1992), National Tourism Policy (2000), National Policy (2002) & the current National Tourism Policy.

Module – IV
Important features of Five Year Tourism Plans in India.
Maharashtra Tourism Policy.

Module -V : Tutorials, assignments and presentation based on Module I to IV

References:

1. Indian Tourism Beyond the Millennium - Bezbaruah M.P. (New Delhi)
2. Tourism: Past Present & Future : Burkart A.J. and Medlik (London, Heinemann)
3. Tourism Planning : Gunn. Clare A. (New York, Taylor & Francis)

4. Tourism Dimensions : S.P. Tiwari (New Delhi)
5. Tourism : A Community Approach - Murphy, Peter E. (New York, Methuen)
6. Negi Jag Mohan: Foundation for Tourism Development

PAPER – VOC-622: Tourism Administration in India

Learning Objectives –

To introduce the organizations involved in administration of tourism at International, national & state level.

Learning Outcomes-

1. Students will have thorough knowledge tourism administration
2. Students can start their business in tourism industry

Module – I

Introduction to administration, administrative system in India

Module – II

National Tourism organizations, Organizational Set up and Functions of Ministry of Tourism (MoT) Government of India ,India Tourism Development Corporation (ITDC) Other National Institutions and organizations related to tourism: ASI, DGCA, AAI, Indian Railways, IRCTC.

Module – III

Maharashtra Tourism Development Corporation: History, Role, Structure

Module– IV

Other State Institutions and organizations related to tourism : State Archaeology, Department of Environment & Forest, Maharashtra State Road Transport Corporation (MSRTC), Local governing bodies

Module V : Tutorials, assignments and presentation based on Module I to IV

References:

1. Bhatia. Tourism Development (New Delhi, Sterling)
2. Seth: Tourism Management (New Delhi, Sterling)
3. Kaul: Dynamics of Tourism (New Delhi, Sterling)

4. Mill and Morrison – The Tourism system an Introductory Text (1992) Prentice Hall
5. Cooper, Fletcher, Tourism, Principles and practices (1993) Pitman
6. Burkart and Medlik Tourism, Past, Present and Future (1981) Heinemenn, ELBS.

PAPER – VOC-623: Laboratory Course - X / Assignments

This paper includes assignments such as field work, seminar, practical training, report writing, review of literature or any other innovative practices. The course would specially focus on field visits to different tourism products in the region.

PAPER – VOC-624: Major Project – Phase-II

PAPER – VOC-625: In-plant Internship/Field Work/ Project/Dissertation

Skill Development Component

Automobile

VOC 631 :

VOC 632 :

VOC 633 :Laboratory Course - X

VOC 634 :Major project- Phase-II

VOC 635 :In-plant Internship / Field Work/ Project/ Dissertation