PSG INSTITUTE OF MANAGEMENT
PSG COLLEGE OF TECHNOLOGY
COIMBATORE - 641 004

(Autonomous College affiliated to Anna University, Chennai)

MBA – WASTE MANAGEMENT AND SOCIAL ENTREPRENEURSHIP DEGREE PROGRAMME (Full Time)

2018 REGULATIONS AND SYLLABUS

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004

(Autonomous College affiliated to Anna University, Chennai)

2018 REGULATIONS OF MBA DEGREE PROGRAMMES

(for the batches of students admitted in 2018-19 and subsequently under Choice Based Credit System)

NOTE: The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of students (including those already in the middle of the programme) as may be decided by the Academic Council.

1. PRELIMINARY DEFINITIONS AND NOMENCLATURE

In the following Regulations, unless the context otherwise requires

i **"Programme"** means Degree Programme, such as **MBA, MBA (Waste Management and Social Entrepreneurship) Programme**

ii **"Course"** means a theory or practical subject that is normally studied in a semester, such as Quantitative Techniques, Financial Management and the like.

iii **"University"** means **Anna University, Chennai.**

2. DURATION OF THE PROGRAMME

i. **Minimum Duration:** The programme will extend over a period of two academic years, leading to the Degree of Master of Business Administration (MBA), Master of Business Administration (Waste Management and Social Entrepreneurship) (MBA (WM&SE)) in full time mode and three academic years in the case of MBA (part-time), of the University, an academic year being divided into two semesters.

Each semester shall normally consist of 90 working days including examination days.

ii. **Maximum Duration:** The student shall complete the MBA, MBA (WM&SE) full time degree programmes in 2 years (4 semesters) and 3 years (6 semesters) in case of MBA (part-time) programme. But in any case not more than 4 years for the full time programme; or 5 years in case of part-time programme. These durations are to be reckoned from the commencement of the semester to which the student was first admitted to the programme.

3. QUALIFICATIONS FOR ADMISSION

The MBA degree programme offered and the eligible qualifications for admission to the respective programmes are listed below:

Department	Degree Programme offered	Full-time (FT)/Part-time (PT)	Eligible Qualification for Admission (Note 1)	Minimum Credits (Note 2)
Management Sciences	MBA	Full-time (FT)	Students for admission to the programme leading to the degree of Master of Business Administration (MBA) shall be required to have passed any degree examination of Anna University or any other examination of any recognized University or authority accepted by Anna University as equivalent thereto, subject to amendments as may be made by Anna University from time to time. The candidates shall also be required to satisfy all other conditions of admission thereto prescribed by Anna University.	92
	MBA	**Part-time (PT)**	Students for admission to the programme leading to the degree of Master of Business Administration (MBA) shall be required to have passed any degree examination of Anna University or any other examination of any recognized University or authority accepted by Anna University as equivalent thereto, subject to amendments as may be made by Anna University from time to time. The candidates shall also be required to satisfy all other	92

			conditions of admission thereto prescribed by Anna University. In addition, candidates are required to possess a minimum of two years of work experience. Students should satisfy conditions regarding experience, sponsorship, place of work etc. that may be prescribed by the University from time to time.	
	MBA (WM&SE)	**Full Time (FT)**	Students for admission to the programme leading to the degree of Master of Business Administration (Waste Management and Social Entrepreneurship) shall be required to have passed any degree examination of Anna University or any other examination of any recognized University or authority accepted by Anna University as equivalent thereto, subject to amendments as may be made by Anna University from time to time. The candidates shall also be required to satisfy all other conditions of admission thereto prescribed by Anna University.	93

Note 1: Eligible Qualification is subject to amendments as may be made by the University from time to time.

Note 2: Minimum credits to be earned through successful completion of the courses of study of the respective degree programme are listed in section 13, for the award of degree.

4. STRUCTURE OF PROGRAMME

i. The course work of the odd semesters will normally be conducted only in odd semesters and that of the even semesters only in even semesters.

ii. Curriculum: The curriculum will comprise courses of study as given in section 13 infra in accordance with the prescribed syllabi.

iii. Bridge Course: At the beginning of the first semester every candidate shall undergo a short term bridge course namely Fundamentals for Mangers, Business Mathematics and Spreadsheet Applications spread over a period of two weeks with 100% continuous assessment.

iv. Foundation Courses (FC) may include Mathematics or other basic courses

v. Professional Core (PC) courses include the core courses relevant to the chosen specialization/branch

vi. Professional Elective (PE) courses include the elective courses relevant to the chosen specialization/branch

vii. Employability Enhancement Courses (EEC) include Project Work, and/or Internship, Seminar, Professional Practices, Case Study and Industrial/Practical Training

viii. **Online courses**: Students can register and earn credits for online courses approved by department committee consisting of HoD, Programme Coordinator, Tutor and Subject Expert. A candidate who completes online courses successfully to a maximum of 6 credits may obtain exemption from studying two Professional Electives. The list of online courses is to be approved by Chairman Academic Council on the recommendation of HoD at the beginning of the semester if necessary, subject to ratification in the next Academic council meeting. The Committee will monitor the progress of the student and recommend the grade or evaluate the candidate in 100% Continuous Assessment (CA) pattern, if necessary. Candidates may do online courses during the third semester and the fourth semester.

ix. **Self Study Courses:** A student can opt for Self Study of one elective course, provided the student does not have current arrears and has earned a CGPA of 8.0 and above. The purpose of the self study course is to permit the student to study an elective of the student's choice from the list of Professional electives. The students shall study on their own under the guidance of a faculty member approved by the Head of the Department who will be responsible for the periodic monitoring and evaluation of the course. No formal lectures would be delivered. The self study course can be considered as equivalent to studying an elective course.

x. **Internship:** Every student of MBA (FT) shall undertake a summer internship at the end of second semester in an industrial / research organization in consultation with the faculty guide and the Head of the Department and the same shall be jointly supervised by a faculty guide and an expert from the organization. Each candidate is expected to prepare a report about the summer internship and make a presentation of the same. This will be evaluated by experts from industry and academia. Every student of MBA (WM&SE) shall undertake three internships as mentioned in infra 13 adhering to the norms mentioned above.

xi. **Project Work / Course Work:** MBA (FT) students can choose to do either project work (research-based) or to study 2 elective courses (electives 6 and 12) in the third and final semesters as shown in Section 13. MBA (PT) students can choose to do either project work (research-based) or to study 2 elective courses (electives 9 and 12) in the fifth and final semesters as shown in Section 13. Students who aspire to do project work should submit their research proposal and based on the quality, approval for doing project work will be provided by the Faculty Committee.

viii Course Enrollment and Registration:

a) Each student, on admission shall be assigned to a Tutor who shall advise and counsel the student about the details of the academic programme and the choice of courses considering the student's academic background and career objectives.

b) Each student on admission shall register for all the courses prescribed in the curriculum in the student's first semester of study.

c) From 2nd semester onwards, a MBA (FT) student has the option to study additionally two theory courses which shall be Professional Electives. However the maximum number of credits the student can register in a particular semester cannot exceed 30 credits including courses for which the student has registered for redo. MBA (PT) can avail this option from 3rd semester onwards.

d) In case of a student dropping a course of study (other than professional core courses) in one semester, he/she shall register for that course in the next given opportunity and earn necessary attendance in that course exclusively to become eligible to appear for the semester examination in that course.

e) The courses to be offered in a semester for failed candidates, attendance shortage candidates etc., will be decided by HoD.

f) After registering for a course, a student shall attend the classes, satisfy the attendance requirements, earn Continuous Assessment marks and appear for the End Semester Examinations.

The enrollment for all the courses of the Semester II for all the programs will commence 10 working days prior to the last working day of Semester I. The student shall confirm the enrollment by registering for the courses within the first five working days after the commencement of the Semester

II.

The enrollment for all the courses of the Semester III for MBA (PT) will commence 10 working days prior to the last working day of Semester II. The student shall confirm the enrollment by registering for the courses within the first five working days after the commencement of the Semester III

The enrollment for the courses of the Semesters III to IV for MBA (FT) and MBA (WM&SE) will commence 10 working days prior to the last working day of the preceding semester. For MBA (PT), same rule will apply for Semesters IV to VI. The student shall enroll for the courses with the guidance of the Tutor. If the student wishes, the student may drop or add courses subject to eligibility within five working days after the commencement of the concerned semester and complete the registration process duly authorized by the Tutor.

ix. Every student will maintain a registration card which will contain the details of courses registered in each semester, credits earned, courses failed etc., as on date. The Tutor will also maintain a parallel record to monitor.

x. Credit assignment: Each course is assigned certain number of credits based on the following:

Contact Period per semester	**Credits**
15 Lecture Period	1
30 Tutorial Periods	1
30 Practical Periods	1
(Laboratory / Seminar / Project Work / etc.)	

The Contact Periods per week for Tutorials and Practicals can only be in multiples of 2. The exact number of credits assigned to the different courses is shown in section 13.

xi. Minimum credits: For the award of the degree, the student shall earn a minimum number of total credits of 92 for MBA (FT) and MBA (PT), 93 for MBA (WM&SE) by passing the prescribed courses of study as given in Section 13.

xii. Medium of instruction: The medium of instruction, examinations, project report etc. shall be English.

5. REQUIREMENTS OF ATTENDANCE AND PROGRESS

i) A student will be qualified to appear for end semester examinations in a particular course of a semester only if

a) he/she has satisfied the attendance requirements as per the norms given below:

- Shall secure not less than 75% attendance in that course
- If a student secures attendance 65% or more but less than 75% in any course in the current semester due to medical reasons (hospitalization / accident / specific illness) or due to participation in the College / University / State / National / International level Sports events with prior permission from the Chairman, Sports Board and Head of the Department concerned, the student shall be given exemption from the prescribed attendance requirement and the student shall be permitted to appear for the end semester examination of that course.

b) his/her progress has been satisfactory and

c) his/her conduct has been satisfactory.

ii) A student shall normally be permitted to appear for End semester examination of the course if the student has satisfied the attendance requirements (vide Clause i(a)) and has registered for examination in those courses of that semester by paying the prescribed fee.

iii) a) Students who do not satisfy clause 5(i) supra will not be permitted to appear for the Semester End Examinations / Evaluation of that courses. They have to register and redo those courses in a subsequent semester when it is offered next, earn necessary attendance and CA marks and appear for semester end examinations.

b) If the total number of "Redo" courses at the end of any EVEN semester is more than TEN for a student, he/she will not be eligible to register for next immediate odd and further semester courses.

Such students will be permitted to register for those semester courses only when offered next, subject to the condition that the number of "Redo" courses is less than or equal to TEN at the time of registration.

c) If a student with more than TEN "Redo" courses is in the last batch of his/her current regulation then

i. the courses which he/she has to redo in the next regulation instead of the redo courses in the current regulation.

ii. the passed courses in the current regulation which could be / could not be found equivalent to courses in next regulation for the purpose of calculation of CGPA and

iii. the courses in next regulation which he/she has to study on own without attendance requirement

shall be identified and the student be permitted to redo the courses under the new regulation accordingly.

iv) A student who has already appeared for a course in a semester and passed the examination is not entitled to reappear in the same course for improvement of letter grades / marks.

6. DISCIPLINE

i) The Head of the Institution shall constitute a disciplinary committee to enquire into acts of indiscipline and notify the punishment.

ii) If a student indulges in malpractice in any of the examinations, he/she shall be liable for punitive action as decided by the Board of Examiners.

7. PROCEDURE FOR REJOINING THE PROGRAMME

A student who is required to repeat the study of any semester for want of attendance/ progress/conduct or who desires to rejoin the course after a period of discontinuance or who upon his/her own request is permitted by the authorities to repeat the study of any semester, may join the semester which he/she is eligible or permitted to join, only at the time of its normal commencement for a regular batch of students and after obtaining the approval from the University and Commissioner of Technical Education. No student will however be enrolled in more than one semester at any time and the marks secured earlier in the repeated courses will be discarded.

8. ASSESSMENT AND PASSING REQUIREMENTS

i. **Assessment:** The assessment will comprise of Final Examination (FE) and/or Continuous Assessment (CA), carrying marks as specified in the schema in section 13 infra. The CA marks will be awarded on assessing the student continuously during the semester as per guidelines framed by the College. The assessment for theory courses with CA + FE components or only CA (Full CA) component will be done by relative grading system. The other courses will be assessed by absolute grading system. However, for the purpose of reporting the performance of a student, letter grades and grade points will be awarded as per grading norms stipulated in this section 8.

ii. **Final Examinations:** Final examinations will normally be conducted during October / November and during March / April of each year. Supplementary examinations may be conducted at such times as may be decided by the college.

A student will be permitted to appear for the final semester examination in a course only if he/she has completed the study of that course.

iii. Internship for Full-Time Programme: Every student shall submit a report on internship/s on dates announced by the college / department through the Head of the Department. If a student fails to submit the report on the internship/s, he/she is deemed to have failed in it.

Every student shall make presentation about the internship/s before a review committee constituted by the Head of the Department. The internship/s will be evaluated based on the presentation, reports and viva-voce examination.

The internship/s evaluation will be carried out in the semester indicated in infra 13 and the results of the same will be included along with the other courses of that semester.

iv. **Project Work (Phase-I) for MBA (FT) and MBA (PT):** Every student shall submit a report on Project Work (Phase-I) on dates announced by the department through the faculty guide to the HoD. If a student fails to submit the report on Project Work (Phase-I) on or before the specified date, he/she is deemed to have failed in it.

The student shall also present seminars about the progress of the Project Work (Phase-I) during the appropriate semester. The seminars shall be presented before a review committee constituted by the HoD.

The Project Work (Phase-I) will be evaluated based on the seminars, report and a viva-voce examination. The viva-voce examination will be carried out by a team of faculty appointed by the HoD and the internal examiner.

A student who fails in Project Work (Phase-I) shall register for redoing the same at the beginning of a subsequent semester. However, the student will be allowed to enroll for Project Work (Phase-II) along with Project Work (Phase-I) during the beginning of the subsequent semester for satisfactory completion of both the courses.

Project Work (Phase-II) for MBA (FT) and MBA (PT): Every student shall submit a report on Project Work (Phase-II) on dates announced by the HoD. If a student fails to submit the report on Project Work (Phase-II) on or before the specified date, he/she is deemed to have failed in it.

The student shall also present seminars about the progress of the Project Work (Phase-II) during the appropriate semester. The seminars shall be presented before a review committee constituted by the HoD.

The Project Work (Phase-II) will be evaluated based on the seminars, report and a viva-voce examination. The viva-voce examination will be carried out by a team consisting of an internal examiner, usually the supervisor, and an external examiner, appointed by the HoD. The continuous assessment marks of Project Work (Phase-II) shall not be carried over to the next appearance, if the student had failed in the same.

A student who fails in Project Work (Phase-II) shall register for repeating the same at the beginning of a subsequent semester.

v **Grade and Grade Point:** Each student, based on his / her performance, will be awarded a final grade and grade point as given in the table infra for each course at the end of each semester by following (a) **Relative Grading System** for theory courses having Continuous Assessment (CA) and Final Examination (FE) components and Full CA component (b) **Absolute Grading System** for all other courses like Laboratory courses, Industrial visit & Technical Seminar, One Credit

courses, Project Work I and II, etc.

a. Relative Grading System

In this system, the grades are awarded to the students based on their performance relative to others who have registered for that particular course in a particular class.

For each course, the total mark M [ie., the sum of Continuous Assessment marks (CA) and Final examination marks (FE) in the case of theory courses or CA in the case of courses with 100% Continuous Assessment component] is computed for every candidate. The statistical parameters Mean (μ) and Standard Deviation (σ) of the distribution of marks are arrived at as given below:

$$\mu = \frac{1}{n}\sum_{j=1}^{n} M_j \qquad\qquad \sigma = \sqrt{\frac{\sum_{j=1}^{n}(M_j - \mu)^2}{n}}$$

where, M_j - Total mark of the 'j' th student in the course

n – Number of students who appeared for the examination in that particular course.

The students who secure the total mark M as detailed below are first declared as fail (RA) in a course.

M < minimum of ($\mu - 1.8\sigma$, 50) (or) FE less than 50% of maximum of final examination marks for theory course (or) M less than 50% in total marks for theory and laboratory courses with 100% continuous assessment component	RA

Note:

- "RA" denotes reappearance in a course

After omitting the marks (M) of all failed candidates, revised μ and σ are computed for the marks secured by the remaining candidates (passed), letter grade and grade point to each student are awarded based on the revised μ and σ as detailed below.

Total Mark, M secured by the student (CA +FE)	Grade	Relative Grade Point, g
$M \geq [(\mu+1.5\sigma)]$ and 80	O	10
$\mu+0.52\sigma \leq M < \mu+1.5\sigma$	A+	9
$\mu - 0.25\sigma \leq M < \mu+0.52\sigma$	A	8
$\mu -1.08\sigma \leq M < \mu-0.25\sigma$	B+	7
$M < \mu - 1.08\sigma, \geq 50$	B	6
Withdrawal from examination	W	0
Reappearance	RA	0
Shortage of Attendance	SA	0

Note:

- If the total number of candidates passed is less than 10, the grades shall be awarded as per Absolute Grading System otherwise Relative Grading System may be followed.
- No 'O' grade shall be awarded if scored mark is less than 80.
- If the maximum marks awarded in a course is greater than or equal to 95% and if the number of candidates getting 'O' Grade is less than 7% of the total number of candidates, then some candidates with A+ grade may be awarded 'O' grade. In such a case some candidates having 'A' grade may be awarded 'A+' grade and some candidates having 'B+' grade may be awarded 'A' grade in order to ensure that a minimum of 23% of the candidates are awarded 'A+' grade and 30% of the candidates are awarded 'A' grade.

- **The Performance Analysis Committee** chaired by Principal consisting of Controller of Examinations and all the Heads of the Departments will by collective wisdom, normalize the marks secured by the students so as to ensure that the clustering, grading decisions have been made in a reasonable manner for all the courses.

b. Absolute Grading System

In absolute grading system, the letter grade and grade points are awarded to each student based on the percentage of marks secured by him/her in all courses like Laboratory courses, Industrial visit & Technical Seminar, One Credit courses, Project Work I and II, etc. as detailed below.

Range of percentage of total marks	Letter grade	Grade Point g
90 to 100	O	10
80 to 89	A+	9
70 to 79	A	8
60 to 69	B+	7
50 to 59	B	6
0 to 49 or less than 50% in final examination	RA	0
Withdrawal from examination	W	0
Shortage of Attendance	SA	0

- "RA" denotes Reappearance in a course.

The grades RA and SA will not figure in the grade sheet.

c. For online courses the following grading pattern is applicable in case of credit transfer and CGPA calculations

Range of percentage of total marks	Letter grade	Grade Point g
90 to 100	O	10
76 to 89	A+	9
60 to 75	A	8
50 to 59	B+	7
40 to 49	B	6

vi. Cumulative Grade Point Average: After the completion of the programme, the Cumulative Grade Point Average (CGPA) from the first semester to final semester is calculated using the formula.

$$CGPA = \frac{\sum g_i * C_i}{\sum C_i}$$

where g_i is Grade point secured corresponding to the course - i
C_i is Credit rating of the course - i

vii. Passing a course:

a. A student shall be deemed to have passed a theory course with CA+FE components, if

i. he/she secures at least 50% in the final examination paper and

ii. the total marks secured by him/her(CA+FE put together) is at least (μ-1.8σ) or 50%, whichever is lower, where μ is the average mark of the students registered for the course and σ is the corresponding standard deviation.

A student is deemed to have passed in internship/s, if the total mark secured by him/her is at least 50%.

A student is deemed to have passed a theory course with Full CA component, if the total mark secured by him/her is at least (μ −1.8σ) or 50%, whichever is lower, where μ is the average mark of the students registered for the course and σ is the corresponding standard deviation.

A student is deemed to have passed in Project work if he/she secures at least 50% in the final examination and the total mark secured by him/her is at least 50%.

b. A student who after having earned necessary attendance is absent for final end semester examination or has failed in any theory course carrying Continuous Assessment and Final Examination marks is permitted to retain the Continuous Assessment mark already earned in that course until he/she passes that course (OR) is permitted to register for redoing in the subsequent semester when it is offered next and earn Continuous Assessment mark and appear for the final end semester examination. However, the attendance requirement (vide clause 5) is not compulsory for such course. Such student shall register his / her option about retaining / not retaining of CA marks at the beginning of the next immediate semester and the option once exercised is final and cannot be reversed later till he/she obtains a pass in that course. The same conditions will apply to the course project work also.

c. A student who after having earned necessary attendance has failed in any course carrying only continuous assessment marks, will choose to redo the course in the subsequent semester when offered next. However, the attendance requirement (vide clause 5) is not compulsory for such course

d. If a student is absent or has failed in an elective course, he/she may register for the same course as detailed in para (b) above or for any other elective in the subsequent semester by registering afresh.

e. If a student is prevented from writing end semester examination in any course due to lack of attendance, the student has to register for that course again, when offered next, attend the classes and fulfill the attendance requirements as per clause 5. If the course, in which the student has lack of attendance, is an Elective course, the student may register for the same or any other Elective course in the subsequent semesters.

f. A student after registering for a course may withdraw his / her registration between first & second CA Test on valid reasons.

g. For MBA (FT) and MBA (PT), out of the required ten/twelve Professional Electives) to be studied, the student shall study a minimum of eight/ten Professional Electives from the list of Professional electives prescribed in their scheme of examinations without fail and can study the remaining two Professional electives either from the

list of electives prescribed in the scheme or as online courses / special courses by obtaining equivalence.

In the case of the student completing more than ten/twelve Professional electives totally eight/ten Professional Electives with highest grade among all Professional Electives studied under the scheme and the two courses with next highest grade among all remaining courses will be considered for calculation of CGPA; however the grades obtained in all other left over courses will also appear in the grade sheet.

For MBA (WM&SE), a maximum of two electives can be done online.

h. A student who is absent in the final semester examination of a course after registering for the same will be considered to have appeared and failed in that examination and awarded grade RA.

i. A student who does not submit the report on Project Work on or before the date specified by the college / department, shall be deemed to have failed in project work and awarded grade RA.

j. A student who submits the report on Project Work, but could not appear for the viva voce examination on the scheduled date, shall be deemed to have failed in the project work and awarded grade RA.

k. A student whose project report is not accepted for reasons of incompleteness or other serious deficiencies will have to register for the same at the beginning of the subsequent semester, redo and submit the project report at the end of that semester and appear for the viva voce examination, the CA mark earned afresh.

viii Supplementary Examinations:

a) Supplementary Examinations in any course is the end semester examination written by a candidate who failed in first appearance but choose to carry over the CA mark already earned to the next appearance(s).

b) Absolute grade will be awarded for all who write supplementary examinations irrespective of whether it was originally under Relative Grading System or Absolute Grading System.

c) The candidate can apply for Revaluation in any theory course (for regular and supplementary Examinations) directly (or) for Retotaling first and after perusal may apply for Revaluation.

9. QUALIFICATION FOR THE AWARD OF DEGREE

A student will be declared to have qualified for the award of the MBA, MBA (WM&SE) degree provided

i. the student has successfully completed the course requirements and has passed all the prescribed courses of study of the respective programme listed in section 13 infra within the duration specified in section 2(ii) supra and earned the total number of credits as specified in the curriculum of the respective programme of study. However, if the student wishes, he/she may be permitted to earn more than the total number of credits prescribed in the curriculum of his/her programme.

ii. no disciplinary action is pending against the student.

10. CLASSIFICATION OF DEGREE

A) FIRST CLASS WITH DISTINCTION:

A student who satisfies the following conditions shall be declared to have passed the examination in First class with Distinction.

* Should have passed the end semester examination in all the courses of all the four semesters of MBA (FT), MBA (WM&SE) in his/her First appearance, within three years for MBA(FT), MBA (WM&SE), which includes authorized break of study. The one year withdrawal from examination (vide clause 11) will not be considered as an appearance.

* Should have passed the end semester examination in all the courses of all the six semesters of MBA (PT), in his/her First appearance, within four years for MBA(PT), which includes authorized break of study. The one year withdrawal from examination (vide clause 11) will not be considered as an appearance

* Should have secured a CGPA of not less than 8.5

* Should not have been prevented from writing end semester examination due to lack of attendance in any of the courses.

B) FIRST CLASS:

A student who satisfies the following condition shall be declared to have passed the examination in First Class.

* Should have passed the end semester examination in all the courses of, all four semesters within three years of MBA(FT), MBA (WM&SE), which includes one year of authorized break of study (if availed) or prevention from writing the end semester examination due to lack of attendance (if applicable)

* Should have passed the end semester examination in all the courses of, all four semesters within four years of MBA(PT), which includes one year of authorized break of study (if availed) or prevention from writing the end semester examination due to lack of attendance (if applicable)

* Should have secured a CGPA of not less than 7.

C) SECOND CLASS:

All other students (not covered in clauses 10 A and B) who qualify for the award of the degree shall be declared to have passed the examination in Second class.

11. WITHDRAWAL FROM EXAMINATION

i) A student may, for valid reasons, be granted permission to withdraw from appearing for the examination in any course or courses of only one semester if he/she does not have any history of arrears at the time of request for withdrawal. Prior permission for withdrawal from semester examinations is to be obtained from Principal. Also, only one application for withdrawal is permitted for that semester examination in which withdrawal is sought. Withdrawal may be granted only once during one semester examination throughout the period of study what so ever the reasons may be.

ii) Withdrawal application shall be valid only if the student is otherwise eligible to write the examination and if it is made prior to the commencement of the examination in that course or courses and also recommended by the Head of the Department.

iii) A student shall be eligible for award of ranking only if he/she has passed the examination in first class with distinction or first class in having passed all the courses in first attempt. Those who have availed the provision of break of study / withdrawal will not be eligible for rank.

12. TEMPORARY BREAK OF STUDY FROM THE PROGRAMME

i) Under Choice Based Credit System, students will have the provision to take a break of study at the beginning of a semester to re-do and complete the arrear courses of previous semesters or on valid reasons (such as accident or hospitalization due to prolonged ill health) and rejoin the programme in a semester which he/she is eligible and he/she shall apply to the Principal through the Head of the Department stating the reasons therefore

ii) A student is permitted to rejoin the programme at the respective semester as and when it is offered after the break, subject to the approval of Commissioner of Technical Education and Anna University, Chennai, and shall be governed by rules and regulations in force at the time of rejoining.

iii) The duration specified for passing all the courses for the purpose of classification (vide sections 10 (A) and (B) supra) shall be increased by the period of such break of study permitted.

iv) The total period for completion of the programme reckoned from the commencement of the semester to which the student was first admitted shall not exceed the maximum period specified in section 2 (ii) supra irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.

v) If any student is detained for want of requisite attendance, progress and conduct, the period spent in that semester shall not be considered as permitted 'Break of Study' and section 12 (iii) supra is not applicable for such cases.

13. MBA (WM&SE) SCHEMA

Schema

MBA (WS&SE) Schema									(Minimum Credits to be earned = 93)
Course Code	**Course Title**	**Category**	**Lecture**	**Tutorial**	**Practical**	**Credits**	**CA**	**FE**	**TOTAL**
SEMESTER – I									
18GW11	Business Mathematics and Spreadsheet Applications	FC	0	0	2	1	100	-	100
18GW12	Introduction to Waste Management	FC	3	0	0	3	50	50	100
18GW13	Principles and Practices of Management	FC	3	0	0	3	50	50	100
18GW14	Fundamentals of Operations Management	FC	3	0	0	3	50	50	100
18GW15	Managerial Economics	FC	3	0	0	3	50	50	100
18GW16	Financial Accounting	FC	3	0	0	3	50	50	100
18GW17	Research Methods for Management	FC	3	0	0	3	50	50	100
18GW18	Business Communication	FC	0	0	4	2	100	-	100
18GW19	Sustainability Lab I	EEC	0	0	2	1	100	-	100
TOTAL			**18**	**0**	**8**	**22**	**600**	**300**	**900**
SEMESTER – II									
18GW21	Internship I	EEC	0	0	8	4	50	50	100
18GW22	Individual and Organizational Behaviour	FC	3	0	0	3	50	50	100
18GW23	Waste Management Logistics and Technical Processes and Methods	FC	3	0	0	3	50	50	100
18GW24	Financial Management	PC	3	0	0	3	50	50	100
18GW25	Marketing Management	PC	3	0	0	3	50	50	100
18GW26	Entrepreneurship in Waste Management	PC	3	0	0	3	50	50	100
18GW27	Physical Fitness through Yoga	EEC	0	0	2	1	100	-	100
18GW28	Sustainability Lab II	EEC	0	0	2	1	100	-	100
TOTAL			**15**	**0**	**12**	**21**	**500**	**300**	**800**

FC- Foundation Course, PC- Professional Core, PE- Professional Electives, EEC- Employability Enhancement Course, CA- Continuous Assessment, FE- Final Examination

MBA – WS (Full Time) Schema						(Minimum Credits to be earned = 93)			
Course Code	**Course Title**	**Category**	**Lectures**	**Tutorial**	**Practical**	**Credits**	**CA**	**FE**	**TOTAL**
SEMESTER – III									
18GW31	Internship II	EEC	0	0	16	8	50	50	100
18GW32	Human Resource Management and Organizational Development	PC	3	0	0	3	50	50	100
18GW33	Strategic Management	PC	3	0	0	3	50	50	100
18GW34	Regulatory Framework- Legal Aspects and Mandatory Regulations	PC	3	0	0	3	50	50	100
18G____	Elective 1	PE	3	0	0	3	50	50	100
18G____	Elective 2	PE	3	0	0	3	50	50	100
18GW35	Health, Fitness and Nutrition for Managers	EEC	0	0	2	1	50	50	100
18GW36	Design Thinking	EEC	0	0	2	1	100	-	100
18GW37	Sustainability Lab III	EEC	0	0	4	2	100	-	100
TOTAL			**15**	**0**	**24**	**27**	**550**	**350**	**900**
SEMESTER – IV									
18GW41	Internship III	EEC	0	0	8	4	100	-	100
18GW42	Information and Communication Technology & Management Information Systems	PC	3	0	0	3	50	50	100
18GW43	Waste Management as Project Management and Geographic Information System	PC	3	0	0	3	50	50	100
18GW44	Creativity and Innovation	PC	3	0	0	3	50	50	100
18G____	Elective 3	PE	3	0	0	3	50	50	100
18G____	Elective 4	PE	3	0	0	3	50	50	100
18GW45	Managing Contracts	EEC	0	0	2	1	100	-	100
18GW46	Throughput Accounting and Theory of Constraints	EEC	0	0	2	1	100	-	100
18GW47	Sustainability Lab IV	EEC	0	0	4	2	100	-	100
TOTAL			**15**	**0**	**16**	**23**	**650**	**250**	**900**

FC- Foundation Course, PC- Professional Core, PE- Professional Electives, EEC- Employability Enhancement Course, CA- Continuous Assessment, FE- Final Examination

List of Professional Electives

Course Code	Course Title
18GWA1	Operations and Maintenance
18GWA2	Environment Impact Assessment
18GWA3	Cost of Non-management of Solid and Liquid Waste
18GWA4	Hotel Waste Management
18GWA5	Reclamation, Remediation and Capping
18GWA6	Sanitation and Hygiene
18GWB1	Market Integration for Waste Management
18GWB2	Consumer Behavior
18GWB3	Integrated Marketing Communication
18GWB4	Service Marketing
18GWB5	Product and Brand Management
18GWB6	Waste Exports, Procedures and Documentation
18GWC1	E-Waste Management
18GWC2	Resource Efficiency and Resource Recovery
18GWC3	Integrated Waste Management
18GWC4	Bio Medical Waste Management
18GWC5	Water Resource Management
18GWC6	Waste Management Banks
18GWC7	Waste Management Technologies

CORE COURSES

18GW11

BUSINESS MATHEMATICS AND SPREAD SHEET APPLICATIONS

0 0 2 1

Learning Objective(s): To attain proficiency in solving business math problems and to develop and apply fundamental spreadsheet skills.

At the end of the course, the student should be able to:
CO1: Recall fundamental principles and concepts of Business Mathematics
CO2: Perform operations and calculations in MS Excel

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3	3	
CO2	3	3		3	3	

UNIT I: BUSINESS MATHEMATICS **15 hrs**

Simple Interest, Compound Interest, Arithmetic Progression and Geometric Progression; Bankers discount. Cost, Revenue and Profit- Calculations and Functions. Average and Marginal Values. Curve fitting. Linear Programming Problem-Graphical method Project Networking –Critical Path Method.

UNIT II: SPREAD SHEET APPLICATIONS **15 hrs**

Introduction to Excel - Excel Interface, Navigation and Editing, Cell Referencing, Data Handling (Sorting, Filtering, Dropdowns etc.), Formats, Inbuilt Functions, Lookup, Mail Merge, Data Manipulation, Protecting Content, Data Validation

Data Analysis & Presentation - Charts and Graphs (including Gantt chart), Pivot Tables, What-If Analysis (Scenario Manager and Goal Seek) Introduction to VBA, Simple macros

TOTAL : 30 hrs

Reference books:

1. Marvin L.Bittinger (1987), 'Business Mathematics for College Students', Addison-Wesley Publishing Company.
2. Sharma J.K. (2010), 'Quantitative Techniques-Theory and Applications', Macmillan.

18GW12
INTRODUCTION TO WASTE MANAGEMENT

3 0 0 3

Learning Objective(s): To provide insights in basics of environment and waste such as waste characterisation, source reduction and sustainability tools; and to sensitise students about environmental health and individual responsibility in waste management.

At the end of the course, the student should be able to:
CO1: Recall environmental principles and concepts
CO2: Understand waste generation
CO3: Identify the different types of waste
CO4: Examine source reduction and waste disposal practices
CO5: Outline sustainability tools

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3		3
CO2	3	3				3
CO3	3	3				
CO4	3	3			3	3
CO5	3	3	3	3		

UNIT I : Introduction to Environment **9 hrs**

Ecosystem –meaning, -components- Structure – Functions, Levels of organization in nature- Food chain and Trophic structure, Biogeochemical Cycles, Understanding Carrying Capacity and Assimilation Capacity of Earth, UN Sustainable Development Goals, waste movement – cyclic vs linear, innovating techniques to revert from linear to cyclic

UNIT II : Introduction to Waste Generation **9 hrs**

Waste around us, definition, Waste Handling in Previous Ages, Increasing waste piles – indicates inefficient use of raw material; Reasons for increase in waste quantity, Consumption and population, consumption patterns, Exponential growth of consumption, Effects of Excess Waste Generation, Resource depletion, waste disposal vs waste management, Principles of waste management, Rural waste vs Urban Waste; Pollution – types, waste vs pollution, Statistics for exponential growth of waste generation

UNIT III : Waste Characterisation **9 hrs**

Types of waste; geographical waste or regional waste; Solid Waste management tools – techniques for reducing production of waste, managing through segregation and scientific disposal, Ill-effects of mixing of waste, Categories of Solid Wastes - Domestic Waste, Market Waste, Food Waste, Agricultural waste, Fruit- vegetable market waste, e-

Waste, Industrial Inert Waste, Industrial Hazardous Waste, Bio-Medical Waste and Radioactive Waste, Hazardous waste, Plastic Waste – spread all over oceans, Managing them at source, Next Generation Waste, inventorisation or projection of waste, Domestic waste vs industrial waste; Domestic waste vs institutional waste, C & D waste, Laboratory waste management; non-routine waste(like festivals or functions)

UNIT IV : Source Reduction & Waste Disposal Practices **9 hrs**

Source Reduction, Waste reduction strategies, Economic benefits, Demarcations between Source Reduction and Waste Reduction, Operation on a daily basis, Waste Reduction Program Guideline, Importance of source reduction, Economic benefits of waste reduction, Operation on a daily basis, Innovations examples of waste reduction

Waste Disposal Practices: Conventional Practices vs Modern Practices; Dumping off wastes; Landfill, Recycling; Biological Recycling; Recovery for Energy; Incineration

Urban growth – Municipal management – Administrative framework – Present scenario of solid waste management in ULBs and Rural areas – Current practices and deficiencies in SWM

UNIT V : Sustainability Tools **9 hrs**

Life Cycle Analysis, Extended Producer Responsibility, Corporate Social Responsibility in waste management.

TOTAL : 45 hrs

Reference Books:

1. Introduction to Waste Management, Syed E. Hassan; Wiley- Blackwell; ISBN 978-1-119-43394:2020
2. Waste Management Practices; John Pichtel; 2nd Edition CRC Press
3. Not in My Backyard - Solid Waste Management in Indian Cities by Sunita Narain & Swati Singh Sambyal
4. Integrated Solid Waste Management – Engineering Principles and Management Issues by George et al, McGraw-Hill
5. Environmental Engineering Series - Environmental Management by T.V.Rama Chandra & Vijay Kulkarni

18GW13

PRINCIPLES AND PRACTICES OF MANAGEMENT

3 0 0 3

Learning Objective(s): To facilitate students to recognise the functions and responsibilities of managers and to analyse and understand the business environment.

At the end of the course, the student should be able to:
CO1: Recall basic principles and concepts of management
CO2: Understand the management function of planning
CO3: Outline the basics of organizing, staffing and directing
CO4: Explain the management function of controlling
CO5: Recognise the factors for successful managerial communication

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3			3	3
CO2		3	3			
CO3		3	3			
CO4		3	3			
CO5	3	3	3	3		

UNIT I : Introduction to Management **9 hrs**

Introduction to Management: Management - Meaning, nature, scope and importance of Management, productivity, Management as a Science, Art or a Profession, Universality of Management, Management Principles, Functions of management, Management roles, Levels of Management, Management Skills, Social Responsibility, Ethics and Values in Management, Corporate Social Responsibility, Corporate Governance, Management Vs Administration, Evolution of Management thought- Scientific Management, Fayol's Principles of Management, Hawthorne Experiments, Decision Theory Approach, System Approach, Contingent Approach, Contribution of Peter Drucker.

UNIT II : Planning **9 hrs**

Planning – Meaning, nature and importance, Planning Process, Types of Planning, Measures of effective Planning, Barriers to Effective Plan, Management by Objectives; Decision Making - Meaning, Types of decisions, Decision Making Process, Individual Vs Group Decision Making, Decision Making Conditions, Creativity

UNIT III : Organizing, Staffing and Directing **9 hrs**

Organizing - Meaning, Organization Structure, forms of Organization Structure, Departmentation, Task Force, Virtual Organization, power, authority, accountability, delegation, centralization, decentralization, working team, team effectiveness, dynamics

of group behaviour, influence of group on individual and group decision making
Staffing- Meaning, man power planning, job analysis, job description, job specification, recruitment and selection, training and development, transactional analysis, organization development, performance appraisal, job evaluation. Directing– Meaning, nature, scope and principles of direction, supervision

UNIT IV : Controlling **9 hrs**

Controlling: Meaning, importance, controlling process, types of control, essential of effective control system, behavioural importance of control, control techniques, quality circles, Budgetary and Non-budgetary control. Leadership - Meaning, importance, leadership theories, leadership styles – managerial grid, tri- dimensional grid, leadership as a continuum

UNIT V : Communication **9 hrs**

Communication - Meaning, process, oral, written, Non-verbal, pictorial communication, communication channel, barriers in communication. Communication in Business: Importance and benefits, components – concepts and problems-nonverbal communication – The seven Cs of effective communication: Completeness, Conciseness, consideration, concreteness, clarity, courtesy and correctness – Business Communication in the Global Context: Background to inter-cultural communication - cultural variables, individual cultural variables Forms of Communication: Personal, Interpersonal, Technology & Communication, Communication for Organizational Effectiveness

TOTAL : 45 hrs

Reference Books:

1. George Phirippidis, “The Six Functions of Management: A practical action planning guide for people in management”, Kerr Hill, Incorporated; 1 Edition 2014.
2. Koontz O Donnell– Principles of Management (Tata McGraw Hill)
3. Koontz, Weihrich – Essentials of Management (Tata McGraw Hill)
4. L.M. Prasad – Principles & Practices of Management (Sultan Chand & Sons , New Delhi)
5. Prasad L.M, “Principles and practices of Management”, SCHAND Publication, 2016.

18GW14
FUNDAMENTALS OF OPERATIONS MANAGEMENT

3 0 0 3

Learning Objective(s): To make students understand the importance of production planning and control in organizations and to calculate optimal costs of mandatory expenses.

At the end of the course, the student should be able to:
CO1: Recall the basics for locating business facilities and how to plan optimum layouts for efficient production
CO2: State the principles and concepts in product and service design
CO3: Recollect the tools and techniques for Quality Improvement
CO4: Outline inventory management practices
CO5: Solve problems related to assignment and linear programming

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	3	3	3
CO2	3	3			3	
CO3	3	3			3	
CO4	3	3			3	
CO5	3	3			3	

UNIT I : Facilities Location and Layout & Production Planning and Control 9 hrs
Strategic Importance, Factors affecting Locations (and related problems) and Layout, Installation of facilities, Single Location and Multi location Decisions, Principles and Types of facilities layout. Production Planning and Control : Production Planning Techniques for various Process Choices, Techniques of production control, aggregate planning techniques, Master Production Schedule (MPS); Product Scheduling, Scheduling Procedure and Techniques.

UNIT II : Product and Service Design 9 hrs
Origin of the Product Idea and Selection from Various Alternatives, Characteristics of a Good Design, Process Design, Type of Process Designs, Process Planning Procedure.

UNIT III : Quality Management 9 hrs
Introduction, Meaning, Quality Characteristics of Goods and Services Tools and Techniques for Quality Improvement – Check Sheet, Histogram, Scatter Diagram, Cause and Effect Diagram, Pareto Chart, Statistical Control Chart, Quality assurance, Total Quality management, Model, Service Quality, Concept of Six Sigma and its Application;

Maintenance: TPM: Total Productive Maintenance (TPM), Meaning and Objectives of TPM, Methodology of TPM, Advantages of TPM.

UNIT IV : Inventory Management **9 hrs**

Key Processes to Eliminate Waste, Implementation of JIT, Pre-requisites for implementation, JIT Inventory and Supply Chains Functions of Materials Management, Purchase Management, The Methods of Purchasing, Purchasing Procedure; Inventory Management and Coding , Related problems

UNIT V : Problem Solving **9 hrs**

Problems on Transportation, Problems on Assignment, Linear Programming Problems-Formulation and Solving, Problems on Network Modelling, PERT, CPM

TOTAL : 45 hrs

Reference Books:

1. William J Stevenson, “Operations Management” McGraw Hill Education. 13th Edition, 2018
2. K Aswathappa, G Sudarsana Reddy," Production and Operations Management", Himalaya Publishing house, 2017
3. S. N. Chary, "Production and Operations Management", McGraw Hill Education. 2019.
4. S. D. Sharma, "Operations Research", Kedarnath,2007
5. R. Panneerselvam, "Operations Research", PHI Learning Pvt Ltd.2nd edition,2009.

18GW15
MANAGERIAL ECONOMICS

3 0 0 3

Learning Objective(s): To make students understand the concepts of Economics such as Supply and Demand, Cost and Pricing, Theory of Consumer Behaviour, Monopoly, Duopoly, Oligopoly and Monopolistic Competition.

At the end of the course, the student should be able to:
CO1: Recall basic principles and concepts of managerial economics
CO2: Understand the production function
CO3: Recognise the relationship between production and cost
CO4: Recollect the concepts under market structure
CO5: Explain about externalities and market regulation

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	3	3	3
CO2	3	3			3	
CO3	3	3			3	
CO4	3	3			3	
CO5	3	3				

UNIT I : Managerial Economics **9 hrs**

Ten Principles of Economics, Market Forces of Demand and Supply, Elasticity and its applications. Revenue, Cost and Pricing. Theory of Demand: Indifference Curve Approach and Utility theory, Marginal analysis, Theory of Consumer, Determinants of Demand, Modelling Consumer Demand, Forecasting Consumer Demand, Elasticity of Demand, Consumer Decisions in the Short Run and Long Run.

UNIT II : Production Function **9 hrs**

Cost Approach v/s Resource Approach to Production Planning, Economies of Scope and Joint Products, Marginal Cost of Inputs and Economic Rent, Marginal Revenue Product and Derived Demand, Horizontal Integration, Vertical Integration, Transfer Costs, Cost Centre v/s Profit Centre. Market Equilibrium, Shifts in Supply and Demand Curves.

UNIT III : Theory of Production and Cost **9 hrs**

Production with one and two variable inputs, cost concepts, short and long run cost functions, production function in short and long run, economies of scale and scope.

UNIT IV : Market Structure **9 hrs**

Perfect Competition, Why it is desirable? Imperfect Competition, Monopolistic

Competition, Monopoly, Oligopoly, Duopoly, Oligopoly and Cartels, Production Decisions in Non-Cartel Oligopolies, Seller Concentration, Competing in Tight Oligopolies: Pricing Strategies – transparency in cost of production with respect to cost of land, Buyer Power, Firm Strategies in Highly Competitive Markets.

UNIT V : Market Externalities **9 hrs**

Importance of economic and social equity. Free Market Economies v/s Collectivist Economies, Efficiency and Equity, Circumstances under which Market Regulation is desirable, Regulation to Offset Power of Seller and Buyers, Natural Monopoly, Externalities, Externality Taxes, High Cost to Initial Entrant and the Risk of Free Rider Products, Limitations of Market Regulation

TOTAL : 45 hrs

Reference Books:

1. Baumol, W. J., Panzar, J. C., &Willig, R. J. (1982). Contestable markets and the theory of industry structure. San Diego, CA: Harcourt Brace Jovanovich.
2. Coase, R. H. (1937). The nature of the firm.Economica 4(16), 386–405.
3. Milgrom, P. R., & Roberts, J. (1992). Economics, organization & management. Englewood Cliffs, NJ:
4. Samuelson, W. F., & Marks, S. G. (2010). Managerial Economics (6th ed.). Hoboken, NJ: John Wiley & Sons.
5. Managerial Economics: Theory and Applications by D M Mithani, 2016, Himalaya Publishing house

18GW16
FINANCIAL ACCOUNTING

3 0 0 3

Learning Objective(s): To enable students to understand, analyse and interpret information provided by financial statements manually and using software.

At the end of the course, the student should be able to:
CO1: Recall basic principles and concepts of financial accounting
CO2: Read and understand P&L statements, cash flow statements and balance sheets
CO3: Recollect the tools of financial analysis
CO4: Explain the basics of cost accounting
CO5: Review regulatory and statutory compliances

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	3	3	3
CO2	3	3		3	3	
CO3	3	3			3	
CO4	3	3			3	
CO5	3	3		3	3	

UNIT I : Introduction to Financial Accounting **9 hrs**

Accounting and its functions, Accounting as an information system, Basic Accounting Concepts and Accounting Conventions, Accounting Principles, Generally Accepted Accounting Policies (GAAP), Accounting Standards, Accounting Structure, Types of Accounts. Rules regarding Journal Entries, Recording of Journal Entries, Ledger Posting, Cash book, Trial Balance

UNIT II : Preparation of Final Accounts **9 hrs**

Preparation of Final Accounts, Trading Account, Profit & Loss Account, Balance Sheet, Treatment of Adjustments into trial balance. Accounting for Non-Profit Organizations

UNIT III : Financial Statement Analysis **9 hrs**

Meaning and Objectives of Financial Statement Analysis, Limitation of Financial Analysis. Tools of financial analysis: Ratio analysis-liquidity, solvency, performance and profitability, Common size statements, Trend analysis, Fund flow and cash flow statement.

UNIT IV : Cost Accounting **9 hrs**

Cost Accounting, Elements of cost, Cost sheet, Budgeting and Budgetary control, CVP analysis, Break even and decision making tools. Components of cost due to use of land, Pay lease rental for the land and not allow ownership

UNIT V : Regulatory and Statutory Compliances, System and control **9 hrs**

Importance of systems and control, direct taxation-IT, Indirect Taxation-GST. Application of Software: Application of Software: Tally Latest Version, GST based accounting software

TOTAL : 45 hrs

Reference Books:

1. Charles T. Horngren, Gary L. Sundem, John A. Elliott and Donna Philbrick: Introduction to Financial Accounting, Prentice Hall India.
2. Hanif Mukherjee: Financial Accounting, Tata McGraw Hill
3. Charles T. Horngren, Jeff Schatzberg, Gary L. Sundem and William O. Ostratton: Introduction to Management Accounting, Pearson Education.
4. Charles T. Horngren, Srikant M. Datar and George Foster: Cost Accounting- A Managerial Emphasis, Prentice Hall India.
5. N.R.Swamy: Financial Accounting-A managerial Perspective, Prentice Hall India.

18GW17
RESEARCH METHODS FOR MANAGEMENT

3 0 0 3

Learning Objective(s): To facilitate students to practice and conduct research.

At the end of the course, the student should be able to:
CO1: Recollect basic principles and concepts of research methods
CO2: Demonstrate different sampling techniques
CO3: Outline the basics of statistical concepts
CO4: Perform correlation analysis
CO5: Collect and examine data and prepare research reports

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3	3	3
CO2	3	3		3		
CO3	3					
CO4	3	3		3		
CO5				3	3	

UNIT I : Introduction to Research methods **9 hrs**

Concept, Role, nature, scope, need, objectives and managerial value of research, Types of research, Research process, Problems encountered by researcher Understanding the language of research: concept, construct, definition, variable Research Design: Concept, need, importance and feature of a good research design, Different research designs (Exploratory, Descriptive, Experimental and Diagnostic research) – Concept, types and uses

UNIT II : Sampling **9 hrs**

Concept of statistical population, sample, sampling frame, sampling error, sample size, characteristic of a good sample; Types of sampling: Probability sampling – simple random sampling, stratified sampling, cluster sampling, systematic sampling, and Multi-stage sampling. Non- probability sampling – Judgment sampling, convenience sampling and quota sampling; Attitude Scaling Techniques: concept of scale, Rating scales – Likert scales, semantic differential scales and Graphic rating scales; Measurement: Concept of measurement, Level of measurement – Nominal, Ordinal, Interval, and ratio Types of data: Primary data and Secondary data Primary data– definition, Advantages and disadvantages over secondary data; Secondary data– definitions, sources, characteristics; Methods and tools for data collection

UNIT III : Introduction to Statistics **9 hrs**

Meaning and definitions of statistics, scope and limitations of statistics, Role of statistics in Management decisions; Measures of Central Tendency: Mean, Median, Mode, Percentile and Quartiles; Measures of Dispersion: Range, Inter-quartile Range, Quartile Deviation, Mean Deviation, Standard Deviation, Variance and Coefficient of variation.
Probability and Testing of Hypothesis: Basic Concept and approaches of probability, Additive and Multiplicative law of probability, Conditional probability rules, Baye's Theorem; Probability distributions: Meaning, Types and Applications of Binomial, Poisson and Normal distributions. Hypothesis testing and statistical influence (Introduction to methodology and types of errors), Introduction to sample tests for univariate and bivariate analysis using Normal distribution, F-test, t-test, Z-test and Chi-Square test.

UNIT IV : Correlation Analysis **9 hrs**

Meaning and types of correlation, Karl Pearson's coefficient of correlation, Spearman's Rank correlation; Regression Analysis: Meaning and two lines of regression, Relationship between correlation and regression coefficients; Time series Analysis: Time series and its components, Methods of studying components of Time Series, Measurement of trend (Moving Average, Exponential Smoothing and Least Square method); Participatory Action Research (PAR): Principles, Dangers and Drawbacks of Participatory Approaches, Application of PAR in rural and urban setting, Tools of PAR: Wealth Ranking, Timeline, Transect Walk, Seasonality, Social and Resource Mapping, Venn Diagram and Focus Group Discussion.

UNIT V : Data Analysis **9 hrs**

Editing, coding, Classification and Tabulation; Data Analysis –Various kinds of charts and diagrams used in data analysis, Application of statistical techniques for analysing the data, different statistical tests for hypothesis testing, MCDM techniques, Report writing– Significance of report writing, steps in report writing, layout of research report and precautions in writing research reports.

TOTAL : 45 hrs

Reference Books:

1. Cooper, D. R. and Schindler, P., "Business Research Methods", New Delhi, Tata McGraw Hills, 2010.
2. Fowler, F.J., "Survey Research Methods", 4th ed., Sage Publishers, 2009.
3. Hooda, R.P., "Statistics for Business and Economics", 5th ed.", Vikas Publishing House, 2013.
4. Kothari C. R., "Research Methodology: Methods and Techniques", New Delhi, Vishwa Prakashan, 2004.
5. Lancaster, G., "Research Methods in Management, a concise introduction to research in management and business consultancy", Elsevier, 2005.

18GW18
BUSINESS COMMUNICATION

0 0 4 2

Learning Objective(s): To facilitate students to understand and demonstrate the use of basic and advanced proper oral and writing techniques.

At the end of the course, the student should be able to:
CO1: Recall knowledge of communication theory and application.
CO2: Display competence in oral, written, and visual communication.
CO3: Respond effectively to cultural communication differences.
CO4: Use technology to communicate effectively in business settings.
CO5: Demonstrate professional and ethical behavior.

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3			3	3	
CO2	3			3		
CO3	3	3		3	3	
CO4				3		
CO5			3		3	

UNIT I : Communication Framework **12 hrs**

Communication definition - Process of Communication - Importance of Feedback - Giving and Receiving Feedback - Communication Networks in Organizations and their importance - Barriers to Communication and Gateways to overcome

UNIT II : Written Communication Strategies **12 hrs**

Style and Tone in Writing - Three-Step Writing Process for Business Messages - Reports and Proposals – Agenda – Minutes – Circulars – Notices – Memorandum - Strategies for Neutral and Positive messages - Negative messages - Persuasive messages

UNIT III : Nonverbal Communication and Listening Skills **12 hrs**

Definition - Importance of Nonverbal Communication - Classification of Nonverbal Communication and its implications - Process of Listening - Importance of Listening - Classification of Listening - Barriers to Listening andimplications.

UNIT IV : Interpersonal and Intercultural Communication **12 hrs**

Developing and Building Teams - Key Dimensions of Team Communication - Characteristics of Effective Teams - Communication Strategies for Groups and Teams - Business Etiquettes - Understanding Cultural Diversity - Adapting to other Business Cultures - Improving Intercultural Communication Skills.

UNIT V : Oral Presentation Skills **12 hrs**

Identifying the Purpose and Topic - Analyzing the Audience - Collecting and Organizing the Content - Preparing the Visual Aids - Proof Reading and Delivering the Presentation.

TOTAL : 60 hrs

Reference Books:

1. Courtland L Bovee, John V Thill and Abha Chatterjee (2011), "Business Communication Today", Pearson Education, 10th edi.
2. Raymond Lesikar, Marie E Flatley, Kathryn Rentz, Neerja Pande (2011), "Business Communication", Tata McGraw-Hill Publishing Company Limited, 11th edi.
3. Monippally M M (2013), "Business Communication – From Principles to Practice", McGraw Hill Education (India) Pvt Ltd.,
4. Pfeiffer, W S and Padmaja (2013), T V S, "Technical Communication – A Practical Approach", Pearson Education, 6th edi.
5. Taylor, S and Chandra V (2013), "Communication for Business: A Practical Approach", Pearson Education, 4th edi.

18GW19
SUSTAINABILITY LAB I

0 0 2 1

Learning Objective(s): To facilitate students to develop deeper understanding of concepts by experiencing phenomena directly.

At the end of the course, the student should be able to:
CO1: Understand, design and perform situation specific experiments in air sampling
CO2: Understand, design and perform situation specific experiments related to water and wastewater analysis.

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3		3
CO2	3	3		3		3

Air sampling and testing **15 hrs**

Ambient air sampling and sample collection methods using air sampler; Estimation of PM10, PM2.5, Carbon monoxide, sulphur oxides and oxides of nitrogen in ambient air; Wind rose diagram: Collection and analysis of wind data; Particulate and gaseous pollutants (Heavy metals, Pesticides and PAH)

Water and Wastewater analysis **15 hrs**

Methods of sampling and sample preservation techniques, Determination of physico-chemical properties of water : pH, Conductivity, TDS, Total Solids, total volatile solids, turbidity, Alkalinity, Acidity , Hardness , sodium, potassium, Calcium, Magnesium, Chloride, Sulphate, Phosphate, available and total nitrogen, BOD, COD; Determination of the dissolved gases : DO, CO2 and Residual Chlorine; Determination ofthe microbial water quality : MPN Test; Basic water and waste water treatment techniques (Jar test, sand filtration and activated carbon filtration, MLSS and MLVSS)

TOTAL : 30 hrs

18GW21
INTERNSHIP I

0 0 8 4

Learning Objective(s): To develop and improve business skills in communication, technology, quantitative reasoning, and teamwork by observing and participating in business operations and decision-making.

At the end of the course, the student should be able to:
CO1: Integrate theory and practice.
CO2: Develop work habits and attitudes necessary for job success

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3	3	3
CO2	3	3		3	3	3

18GW22
INDIVIDUAL AND ORGANIZATIONAL BEHAVIOUR

3 0 0 3

Learning Objective(s): To provide a basic understanding of the hidden forces affecting work place behaviour and enables students to make better decisions about how to motivate and co-ordinate human actions to achieve organizational goals.

At the end of the course, the student should be able to:
CO1: Recall basic principles and concepts of individual and orgnisational behaviour
CO2: Understand the facets influencing individual behaviour such as values, attitudes
CO3: Outline the foundations of group behaviour
CO4: Recognise and prescribe OD interventions
CO5: Elaborate on organisational culture and the change process

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	3	3	3
CO2	3	3	3			
CO3	3		3			
CO4	3	3				
CO5	3		3			

UNIT I : Introduction **9 hrs**

Organizational Behaviour- Concept and Importance, Historical Development of O.B., Contributing disciplines to the O.B. field, Challenges and Opportunities for O.B., Models of O.B.

UNIT II : Individual Behaviour **9 hrs**

Values: Importance, types, values across culture, Attitudes: Types, cognitive dissonance theory, measuring attitude, Personality: Meaning, determinants, traits, major personality attitudes influencing O.B., Perception - Meaning, factors influencing perception, person perception, Emotions and stress, learning- Kurt Lewin's theory of learning.

UNIT III : Group Behaviour **9 hrs**

Foundations of Group behaviour, Defining and classifying groups, stages of group development, Group structure, Group decision making, Negotiation and Conflict Management, Understanding work teams, Difference between Groups and teams, types of teams, creating effective teams, turning individual into team players.

UNIT IV : Organizational Process- Organizational Development **9 hrs**

Concept, Scope, practice and process of organizational Development interventions, Personal, Interpersonal, group process, in Organizational development, Team Building

and team development, Power and Politics, Case study & simulation exercise**.**

UNIT V : Organizational Culture and Change **9 hrs**

Definition, culture's functions, creating and sustaining culture, how employees learn culture, creating an ethical organizational culture, creating a Customer responsive culture, Organizational change, forces for change, resistance to change, managing, organizational change, Empowerment and quality of work life

TOTAL : 45 hrs

Reference Books:

1. Davis, k Human relations at work: The dynamics of organisational behavior. New York: McGraw-Hill(1967).
2. John W Newstrom, Organizational Behavior HUMAN BEHAVIOR AT WORK, Tata McGraw-Hill publishing Company Limited 2007.
3. Rokeach, M. The nature of human values. New York: The Free Press (1973). Schein, E "Organisational socialization and the profession of management," Industrial management review, 9(1), 1-15(1968).
4. Stephen P. Robbins, Timothy A. Judge, Neharika Vohra Organizational Behavior, Pearson (2005).
5. Suja R. Nair, ORGANISATIONAL BEHAVIOR Text & Cases, Himalaya Publishing House 2005.

18GW23

WASTE MANAGEMENT LOGISTICS AND TECHNICAL PROCESSES AND METHODS

3 0 0 3

Learning Objective(s): To provide insights about logistics and importance of waste technical processing, responsibility of waste management and waste reduction.

At the end of the course, the student should be able to:
CO1: Enumerate the components of logistics
CO2: Understand the basics of inventorization
CO3: Determine a plan for collection and transportation of different types of waste
CO4: Prescribe storage designs and processing steps for waste
CO5: Devise ways to use and reduce waste

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3			3		3
CO2	3			3		
CO3	3	3			3	
CO4	3	3			3	3
CO5	3		3		3	3

UNIT I : Components of Logistics **9 hrs**

Introduction to Waste Management Logistics, importance, methods of logistics, Human Components, Technological Components- Waste Handling Equipment and Technology, and Managerial Goals, Steps in waste management logistics. Basics of GPS & GIS - introduction, importance; GPS aided vehicle; GPS in India, US, Russia

UNIT II : Inventorization **9 hrs**

Inventorization- understanding, sources, kinds of waste, quantity of waste; social mapping; waste generation estimation for zonal wise; allocation of collection vehicle according to waste generation; large vehicle for market & households; Source segregation implementation – different collecting vehicles

UNIT III : Collection and Transportation **9 hrs**

GIS & GPS add here Route optimization, planning, scheduling time, dynamic dispatching, mobile communication, performance auditing and GPS real-time asset tracking, Savings and efficiency, improved service levels, Variable cycle (multi-day, weekly, bi-weekly, monthly, quarterly),Variable route start location, Route Optimization, scheduling, GPS tracking, mobile communications, Categorisation of waste recycling, Economics of recycling, Success stories in recycling / reuse, accurate mapping for route; AHP (Analytical

Hierarchy Process) use with GIS; best practices followed by firms in reverse logistics/ reverse supply chain of waste; unique challenges

UNIT IV : Storage and Processing **9 hrs**

Inventory and material management, Management of Waste Collection, Segregation, Manifest, Transport, Preventive Maintenance, Source segregation management, Management at transfer stations, tertiary transfer Composting –Types and Processes, General Process of Recycling, Precautions for Recycling – Aluminium, Glass, Precautions while Recycling of Plastics, Precautions while Recycling paper, Re-use, Treatment, Disposal

UNIT V : Trade of Waste **9 hrs**

Logistics chain in regional and global level, cradle to grave for producers (industries), managing non- routine waste, agricultural waste, Polluter Pays Principle, Extended Producer Responsibility, Producer Responsibility Organization, Carrying Capacity, precautionary principle, reverse logistics, scrap trade; International Trade of Waste
Initiatives taken by firms& government to do 3R; implications for business – reducing weight of products impact on the supply chain

TOTAL : 45 hrs

Reference Books:

1. John Pichtel , " Waste Management Practices", CRC Press; 2 edition, 2014.
2. Mateusz Jakubiak , AGH w Krakowie, Reverse logistics in waste management from landfilling on streets to sustainable waste management and "zero waste" strategy, LOGISTYKA 4:8990-8996, 2015.
3. P.S Ajith & Dr P.N. Hari Kumar, " Solid Waste Management of Municipalities", Abhjeet, 2016.
4. Trevor M. Letcher, Daniel A. Vallero, "Waste: A Handbook for Management", Second Edition, academic press, 2001.
5. Wilson, D.C., " Waste management: Planning, evaluation and technologies",Oxford. Oxford University Press: New York, 1981.

18GW24
FINANCIAL MANAGEMENT

3 0 0 3

Learning Objective(s): To the students to apply concepts and applications pertaining to financial management including investment, dividend, and financial decisions.

At the end of the course, the student should be able to:
CO1: Recall basic principles and concepts of financial management
CO2: Interpret and evaluate investment decisions
CO3: Outline the fundamentals of working capital management
CO4: Understand the cost of capital and capital structure
CO5: Evaluate dividend decisions

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3	3	3
CO2	3	3		3	3	
CO3	3	3			3	
CO4	3	3			3	
CO5	3	3			3	

UNIT I : Introduction to Financial Management **9 hrs**

Introduction to Financial Management, Concept of time value of money and annuities, Introduction to risk and returns, Types of business organizations, proprietor, partnership, LLP, Companies, OPC, etc. Regulators, credit rating agencies. Calculation of Present value and future value of single cash flow, multiple cash flows, annuity and perpetuity. Determination of Project Cost and Cash flows- Project cost estimation, project financials, project cash flows

UNIT II : Investment Decisions **9 hrs**

Capital budgeting techniques-traditional and discounted techniques, Management of Working Capital: Meaning of WC, Need of WC Management, Determinants of WC, Operating Cycle, Estimation of WC. Sources of Funds- LT sources- equity debt, hybrid sources, PE funding, Venture capital, IPO, ECB, Angel Funding. Short term sources, leasing, hire purchase

UNIT III : Management of Working Capital **9 hrs**

Working Capital Financing: Trade credit, bank finance, commercial paper, factoring, and money market instruments.

UNIT IV : Cost of Capital and Capital Structure **9 hrs**

Cost of equity capital, Cost of preference shares, Cost of debt and weighted average cost, Capital structure theories, Concepts of operating, financial and total leverage

UNIT V : Dividend Decisions **9 hrs**

Types of dividends, factors influencing dividends, dividend theories. Business Evaluation: Income approach method, market approach method

TOTAL : 45 hrs

Reference Books:

1. I.M. Pandey: Financial Management, Vikas Publishing House
2. Prasanna Chandra: Financial Management, Tata McGraw-Hill Publishing.
3. M.Y. Khan and P.K. Jain: Financial Management-Text and Problems, McGraw-Hill.
4. James C. Van Horne: Financial Management, Pearson Education.
5. Richard A. Brearley and Stewart C. Myres: Principles of Corporate Finance, McGraw Hill.

18GW25
MARKETING MANAGEMENT

3 0 0 3

Learning Objective(s): To provide an understanding of issues and concepts in waste marketing. The course helps students to understand consumer behavior towards waste management and creates awareness about Communication Channels, Market Feedback and importance of Social Marketing.

At the end of the course, the student should be able to:
CO1: Recall basic principles and concepts of marketing management
CO2: Understand the marketing strategies with emphasis on pricing
CO3: Characterise systems and channels for communication and distribution
CO4: Appreciate the significance of ICT in marketing
CO5: Recognise the institutions and practices that will ensure market support

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3	3	3
CO2	3	3		3	3	
CO3	3	3		3	3	
CO4	3	3		3	3	
CO5	3	3			3	

UNIT I : Overview of Marketing **9 hrs**
Meaning and definition of Solid Waste Markets. Issues in Waste Marketing. Consumer Behaviour, product categories in waste management, product or service or combination, 4 Ps and 7 Ps of product and service marketing. Branding the product, product features

UNIT II : Marketing Strategy **9 hrs**
Evolving Waste Marketing Strategy; role of informal sector in solid waste management, pricing of the product / service, pricing strategies, Determinants of price, types or levels of products, value creation in product, value chain analysis

UNIT III : Distribution Systems **9 hrs**
Solid Waste Communication and Distribution systems, marketing, cost of channels of distribution, management in solid waste

UNIT IV : ICTs in Marketing **9 hrs**
ICTs in waste Marketing, Role of Social Media, promotion mix elements, role of contemporary modes of marketing communications

UNIT V : Market support **9 hrs**

Role of commercial bank, Credit and Marketing linkages, identifying waste management industry stakeholders, creating awareness within stakeholders for the product or service, generating a standard on-going feedback system for improvements

TOTAL : 45 hrs

Reference Books:

1. Paul Baines, (2013), Marketing, Oxford University Press, 2nd Edition.
2. Ramaswamy Namakumari, (2018), Marketing Management, Sage Publications, 6th Edition.
3. Philip Kotler, (2017), Marketing Management – A south Asian Perspective Microsoft Excel, Pearson Education, 15th Edition.
4. Iacobucci Dawn, (2018), Marketing Management, Cengage Publications, 5th Edition.
5. Rajan Saxena, (2017), Marketing Management, McGraw Hill, New Delhi, 5th Edition.

18GW26

ENTREPRENEURSHIP IN WASTE MANAGEMENT

3 0 0 3

Learning Objective(s): To understand Entrepreneurship in Waste Management, appreciate Entrepreneurial Inputs, Micro Entrepreneurial Systems in the context of managing waste and have basic understanding about financing and limitations of managing waste.

At the end of the course, the student should be able to:
CO1: State the basic principles and concepts of entrepreneurship
CO2: Understand entrepreneurial behaviour and motivation
CO3: Formulate a process for identifying opportunities and business barriers
CO4: Specifically examine waste management opportunities
CO5: Evaluate different types of business models

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3			3	3
CO2		3	3		3	3
CO3		3		3	3	3
CO4						3
CO5		3	3		3	3

UNIT I : Introduction to Entrepreneurship, Entrepreneurial Traits, Types & Significance **9 hrs**

Definitions, Evolution, Characteristics of entrepreneur and entrepreneurship; Qualities and functions of entrepreneurs, Difference between entrepreneur, leader, businessman and Manager; Types of entrepreneur; Factors influencing entrepreneurship: Individual factors- Environmental factors- Socio- cultural factors- Support systems- Entrepreneurial motivation Role and importance of entrepreneur in economic growth. Entrepreneurship as a style of management. Cases of Entrepreneurship Culture.

UNIT II : Entrepreneurial Inputs **9 hrs**

N-Achievement and Entrepreneurial success; Entrepreneurial Behaviours and entrepreneurial motivation Locus of control, Innovation and entrepreneur, sources of Innovation; Management of Innovation, creativity and risk taking. Case study & Simulation exercise, Systems thinking perspectives to SWM, Social Entrepreneurship, and business case development

UNIT III : Entrepreneurial System **9 hrs**

Search for business ideas, sources of idea, idea processing and selection. Input requirements; source and criteria of financing fixed and working capital, New venture management, corporate entrepreneurship, experimental learning of successful and unsuccessful entrepreneurs. Women Entrepreneur: Concept and functions of women entrepreneurs- Problems of women entrepreneurs- Developing women entrepreneurs. Case study & simulation exercise. Idea to implementation (tools and techniques), Government entrepreneurial programme (Aids /funding), incubation opportunities**.**

UNIT IV : Entrepreneurship in Waste Management **9 hrs**

Scope and types of Entrepreneurship, Micro Resource Enterprise, Planning A Waste Managing Enterprise, Human Resources and Infrastructure, Arranging and Managing Finance, Managing a Waste Enterprise, Successful Experiences, Government rules and regulation regarding small industries, role of financial institution – IDBI, SIDBI, SFCs and commercial banks in assisting entrepreneurs, Other supporting institutions- District Industries Centers (DIC), Small Industries Development Organization(SIDO), MSME-DI, Case study presentation. Innovations in waste management, value chain analysis, strategy development

UNIT V : Business Models **9 hrs**

Revenue models, different types, role of ICT in business models, ICT based business models, Role of IT Strategy in formulating business models for waste management. Value chain analysis – Strategic Development core competence; Marketing analysis of SWM; challenges in Entrepreneurship; scale – up opportunities

TOTAL : 45 hrs

Reference Books:

1. Vasant Desai.: Dynamics of Entrepreneurship Development, Himalaya Publishing House
2. Charantinath, Poornima M., Entrepreneurship Development and Small Business Enterprises, Pearson Publication.2nd edition.
3. S B Srivastava : A Practical Guide to Industrial Entrepreneurs, Sultan Chand and Sons, New Delhi
4. Pareck, Udai and T V Rao : Developing entrepreneurship, Sanjiv Printers, Ahmedabad
5. Drucker, Peter, “Innovation and Entrepreneurship” Heinemann London

18GW27
PHYSICAL FITNESS THROUGH YOGA

0 0 2 1

Learning Objective(s): To enable students to improve their mental and physical health.

At the end of the course, the student should be able to:
CO1: Recognize and apply the value and benefits of yoga practice
CO2: Improve physical and mental conditioning.

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1					3	
CO2					3	

Unit I **6 hrs**

Yoga –Purpose of of yoga -History of Yoga – types of Yoga – bhakthi yoga- karma yoga – raja yoga- Gnana Yoga- eight steps in Raja Yoga – what is Temple - physical health & mind

Unit II **6 hrs**

Pranayama- pooraga- kumbhaka-rechaka-breating exercise and sudharchana kriya-varamakalai- varamakalai and pranayama – Division in Varmakalai

Unit III **6 hrs**

Food – Food limit Yoga-Food habits – kinds of food with characters - Fasting – Types of Fasting –full Fasting – Partial Fasting – Fasting with Some Food- Special Treatments in Naturopathy –Banana leaf bath- mudbath- sunbath

Unit IV **6 hrs**

Rejuvenating of Life Force –transformation into seven minerals - –Importance of Sexual Vital Fluid – Kayakalpa- importance of Kayakalpa – Live of siddhas (Jeevan Mukthi)-jeevan Samadhi places of Sanctity – mind – Frequency of Mind waves and Functions – stages of Mind's Functions – Three type of Consciousness – meditation

Unit V **6 hrs**

Introduction of Asanas - General Benefits of Asana – Conducive conditions for asana Surya Namaskar- Types of Asnanas – standing postures – sitting postures –lying on stomach –

lying on back – mudhars - Exercises for Hands and arms- Leg exercise- Breathing exercise – eye exercises – Kalapathy – Makarasanam- Massage- Acupressure- Relaxations

TOTAL : 30 hrs

Reference books:

1. The Spirit and Practice of Moving Through Stillness by Erich Schiffmann
2. Insight Yoga by Sarah Powers
3. Yoga Mind, Body & Spirit - A Return to Wholeness by Donna Farhi
4. The Yoga Bible by Christina Brown
5. Light on Yoga by B.K.S. Iyengar

18GW28
SUSTAINABILITY LAB II

0 0 2 1

Learning Objective(s): To facilitate students to develop deeper understanding of concepts by experiencing phenomena directly.

At the end of the course, the student should be able to:
CO1: Understand, design and perform situation specific experiments in soil analysis
CO2: Understand, design and perform situation specific experiments related to solid waste analysis.

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3		3
CO2	3	3		3		3

Soil Analysis: **15 hrs**

Soil sampling methods; Soil physical parameters: Soil texture, soil colour, Soil moisture , Bulk density and water holding capacity; Soil chemical properties: pH, water soluble solids, calcium and magnesium, chloride, Cation exchange capacity; Estimation of Organic matter and organic carbon; Estimation of Nutrients (Nitrogen, Phosphorus and Potassium); Determination of bio available and total available metals in soils

Solid waste analysis: **15 hrs**

Methods of Solid waste collection and characterization; Physicochemical analysis of solid waste (pH, Conductivity, Moisture content and bulk density; Ca, Mg, Na, K, Phosphate, total Nitrogen, Sulphate; Loss of ignition, Organic carbon, CN ratio; Heavy metals (only toxic metals)) ; Bio gas production from the waste in laboratory (Estimation of methane, carbon di-oxide and total gas, Measurement of pH, total organic carbon and NPK before and after treatment); Leachate collection and analysis

TOTAL : 30 hrs

18GW31
INTERNSHIP II

0 0 16 8

Learning Objective(s): To develop and improve business skills in communication, technology, quantitative reasoning, and teamwork by observing and participating in business operations and decision-making.

At the end of the course, the student should be able to:
CO1: Integrate theory and practice.
CO2: Develop work habits and attitudes necessary for job success

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3	3	3
CO2	3	3		3	3	3

18GW32

HUMAN RESOURCE MANAGEMENT AND ORGANIZATIONAL DEVELOPMENT

3 0 0 3

Learning Objective(s): To understand Human Resource Management and its contemporary issues in OD interventions.

At the end of the course, the student should be able to:
CO1: Recollect basic principles and concepts of human resource management
CO2: Outline the process of recruitment and selection
CO3: State the fundamental principles of organization development
CO4: Prescribe OD interventions for different situations
CO5: Describe the process for implementing an intervention and identify barriers for successful implementation

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	3	3	3
CO2	3				3	
CO3				3	3	
CO4	3				3	
CO5					3	

UNIT I : Introduction **9 hrs**

Meaning of Human Resource Management, Evolution of HRM, Functions of HRM, Nature, Scope and significance of HRM, Changing environment and duties of HR Manager, HRM in Indian scenario. Motivation: Meaning, nature and importance of motivation, Theories of motivation – Maslow, Herzberg, McClelland, Alderfer, Vroom, Porter – Lawler, McGregor, Rewards – Monetary and Non – Monetary, Job design, job enrichment, job satisfaction, quality of work life, morale and productivity Human Resource Planning: Process of HRP, Assessing Human Resource requirements; Human resource forecasting; Work load analysis ; Job analysis-Job description and specifications; Job design; Job redesign- job enlargement, job rotation.

UNIT II : Recruitment and Selection **9 hrs**

HR planning, Job Analysis, Recruitment and Selection, Transfer and Promotion, An overview of Training and Development; process of recruitment- internal and external sources of recruitment Emerging trends in Recruitment, Selection- different types of selection tools to contemporary issues in HRM, and development, E-recruitment, and current trends in recruitment. Contemporary Issues in HRM: Employee compensation concept, factors affecting employee compensation, components of employee

compensation, knowledge management, Human Resource Information System, issues of HRM in organizations

UNIT III : Introduction to Organization Development 9 hrs

Concepts, Nature and Scope of O.D, Historical Perspective of O.D, Underlying Assumptions & Values Theory and Practice on change and changing, The Nature of Planned Change, The Nature of Client Systems : Group Dynamics, Intergroup, Dynamics and Organizations as Systems.

UNIT IV : Interventions 9 hrs

Team Interventions, Inter-group Interventions, Personal, Interpersonal and group process interventions, Comprehensive interventions, Structural Interventions.

UNIT V : Implementation and assessment of O.D 9 hrs

Implementation conditions for failure and success in O.D efforts, Assessment of O.D. and change in organizational performance, the impact of O.D. Some key considerations and Issues in O.D: Issues in consultant, Client relationship, the future of O.D, Some Indian experiences in O.D, Effect of OD interventions leading to organizational effectiveness.

TOTAL : 45 hrs

Reference Books:

1. Aswathappa .K, Human Resource Management ,8th Edition,New Delhi, Tata Mac Graw Hill, 2017
2. Bernadin , Human Resource Management ,6th edition ,Tata Mcgraw Hill ,2012.
3. Gary Dessler, Human Resource Management, 15th edition, Pearson Education Limited, 2016. ISBN 10: 0134304233 ISBN 13: 9780134304236
4. Ramnaryan,S. ,Rao,T.V. & Singh,K. Organizational Development: Intervention and Strategies. Response Books ,NewDelhi, 1998.
5. Thomas G. Cummings & Christopher G. Worley, Organization Development and Change, 10th Edition, Cengage learning, USA, 2013

18GW33
STRATEGIC MANAGEMENT

3 0 0 3

Learning Objective(s): To enable students to understand the basic concepts, principles and practices associated with business strategy formulation and implementation.

At the end of the course, the student should be able to:
CO1: State the basic principles and concepts of strategic management
CO2: Formulate strategies for different business situations
CO3: Use strategic tools to analyse and reform business processes
CO4: Evaluate strategic alternatives
CO5: Recognise the factors for successful implementation of strategy

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3			3
CO2	3	3			3	
CO3	3	3		3	3	
CO4	3	3		3	3	
CO5	3	3			3	

UNIT I : Introduction to Strategic Management **9 hrs**

Concepts of Strategic management, process and strategic decision making, defining business purpose, mission and objectives, strategic intent. Environmental Appraisal-external and internal and Industry analysis, corporate capabilities – SWOT analysis, concept of core competence and value chain analysis,(Case Studies for related topics), concept of competition, PESTEL Analysis, Industry analysis

UNIT II : Formulation of Strategy **9 hrs**

Level of strategy formulation, Generic competitive strategies: cost leadership, and differentiation, framework for analysing competition, competitive positioning of a firm, Game Theory approach to competitive dynamics, market entry.

UNIT III : Strategic Tools **9 hrs**

Business process reengineering, and Balance Score Card. Aggregate and granular metrics and metrics of value creation.

UNIT IV : Strategic alternatives and Choices **9 hrs**

Grand strategies, business level strategies, horizontal, vertical integration, diversification. Strategic Choices- BCG matrix, G.E matrix portfolio analysis - Technology based versus

mature industries, External growth strategy – Strategic Alliances, merger-acquisition, collaborative partnerships.

UNIT V : Implementation of Strategy **9 hrs**

Elements of strategy implementation, structure, McKinsey's 7s framework Resources allocation, corporate leadership, personal values, organizational culture, Strategy evaluation and control. Strategic Issues of development organizations.

TOTAL : 45 hrs

Reference Books:

1. Andrews, K.R., "The Concept of Corporate Strategy", Homewood. IL, Dow Jones Irwin, 1971
2. Max Mckeown, "The Strategy Book, Financial Times Publishing", 2016
3. Porter .M.E. "Competitive Strategy: Techniques for Analyzing Industries and Competitors", New York: Free press, 2018
4. Wheelen.L.Thomas & HungerD.J.(2002), "Strategic Management and Business Policy:Concepts",8Edition,Published by Pearson Education, 2002
5. William Bridges, 'Managing Transitions: Making the Most of the Change', Da Capo Lifelong Books; 3 edition 2009.

18GW34

REGULATORY FRAMEWORK- LEGAL ASPECTS AND MANDATORY REGULATIONS

3 0 0 3

Learning Objective(s): To promote eco-responsible behaviour and practice compliance with regulatory requirements.

At the end of the course, the student should be able to:
CO1: Recall the institutions and the constitutional provisions made to protect the environment
CO2: Enumerate regulations for managing natural resources
CO3: List regulations concerned with hazardous or biomedical waste
CO4: Recollect regulations related to solid waste management
CO5: Assess regulatory framework and effective implementation of regulations

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	3		3
CO2	3	3		3	3	
CO3	3	3		3	3	
CO4	3	3		3	3	
CO5	3	3		3	3	3

UNIT I : Constitutional provisions for the protection of Environment 9 hrs

Fundamental Rights and Fundamental Duties, Directive Principles of State Policy and other Constitutional mandates, Public Interest Litigation and Doctrine of Trust, National Green Tribunal, The Ministry of Environment, Forest and Climate Change, role of CPCB / SPCB; Supreme Court & High Courts case laws discuss for Constitutional Objectives &Environmental Jurisprudence

UNIT II : Regulation for Natural Resource Management 9 hrs

Framework for Established Industries :Consent for Establishment (CFE), Consent for Operations (CFO), Environment Public Hearing, Forest & Wildlife Protection Laws, Air and Water Pollution Control Laws, Factories Act 1948, Motor Vehicles Act 1988, Public Liability Insurance Act 1991, The Environment Protection Act 1986

UNIT III : Legal Framework for Hazardous and Biomedical Waste Management 9 hrs

The Hazardous Waste Management Rules, Biomedical Wastes (Management and Handling) Rules 2016 & 2018, E-waste (Management and Handling) Rules 2018, The Batteries (Management and Handling) Rules 2001

UNIT IV : Legal Aspects for Solid Waste Management **9 hrs**

Municipal Solid Waste Management Rules 2016,Plastic Waste Management Rules 2018, The Construction and Demolition Waste Management Rules 2016, EPR- Extended Producer Responsibility, Cleaner Production Option and Waste Management ; Indian legislation; recycling opportunities; reuse of e- waste; Plastic Waste Management Rules amended in 2018

UNIT V : National and International Instruments **9 hrs**

International Instruments, Corporate Social Responsibility, International Conventions, An assessment of the legal and regulatory framework in India; Assessment of actual /ground implementation of Rules must be undertaken to find out solutions for better Legal & Regulatory frameworks

TOTAL : 45 hrs

Reference Books:

1. Environmental Law and Policy in India: Cases, Materials, and Statutes by Armin Rosencranz and Shyam Divan
2. Environmental Law in India by P. Leela krishnan
3. Environmental and Pollution Laws In India by Justice T S Doabia
4. Environmental Law by Stuant Bell, Donald Mc Gillivary, Ole Pedenson, 2002, Oxford University Press
5. Environmental Law- An introduction by Vibhav Navneet, LEXIS – NEXIS, 2016, 1st edition

18GW35

HEALTH, FITNESS AND NUTRITION FOR MANAGERS

0 0 2 1

Learning Objective(s): To apply fundamentals of physiology and nutrition in promoting a healthy lifestyle.

At the end of the course, the student should be able to:
CO1: Use basic principles of health and wellness to develop an informed, personal approach to mental and physical health.
CO2: Examine lifestyle choices and how they impact overall health and wellness.

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1					3	
CO2					3	

UNIT I : Communicable diseases **6 hrs**

Dimensions of health, determinants of health, agent factors, host factors, environmental factors, modes of transmission, prevention of communicable diseases

UNIT II : Noncommunicable diseases **6 hrs**

Risk factors and prevention of obesity, hypertension, diabetes, coronary heart disease, stroke, cancer, accidents

UNIT III : Healthy practices **6 hrs**

Personal hygiene, proper disposal of solid waste, first aid, stress management, sleep, informing other team members to be healthy

UNIT IV : Nutrition **6 hrs**

Balanced diet, nutritional requirements, nutritional content of foods, nutritional factors in selected diseases like cardiovascular disease, diabetes, cancer, obesity

UNIT V Physical fitness **6 hrs**

Role of physical fitness in maintenance of good health and avoidance of diseases, Types and duration of physical activity

TOTAL 30 hours

Reference Books:

1. Park K, (2017), Park's Textbook of Preventive and Social Medicine, M/s Banarsidas Bhanot Publishers, 24th edition
2. World Health Organization, (2015), Factsheet No. 394 Available from : http://www.who.int/mediacentre/factsheets/fs394/en/ (accessed on07-02-2018)
3. World Health Organization, (2010), Global recommendations on physical activity for health

18GW36
DESIGN THINKING

0 0 2 1

Learning Objective(s): To introduce students to design thinking as a systematic process for resolving business and/or social problems.

At the end of the course, the student should be able to:
CO1: Recall the fundamental concepts and principles of design thinking
CO2: Develop business hypotheses.
CO3: Outline the steps for concept development.
CO4: Design prototypes and test.
CO5: Use design thinking to create competitive advantage.

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3				
CO2	3	3				
CO3	3	3				
CO4	3	3				
CO5	3	3				

UNIT I : Introduction to Design Thinking **6 hrs**

Types of thinking – Analytical, Intuitive, Deduction, Induction, Abduction; Definitions of Design Thinking, Principles and elements of Design Thinking, Human centric approach

UNIT II : DT Process – Stage 1 **6 hrs**

Understanding the business hypothesis, customer perspective, inspiration, visualization through storyboarding etc.

UNIT III : DT Process – Stage 2,3 **6 hrs**

Defining the problem, Data Collection, Observation techniques, gaining insights, Ideation, concept development

UNIT IV : DT Process – Stage 4,5 **6 hrs**

Experimentation, prototyping principles, Prototyping, Testing, Assumptions Identification

UNIT V: DT for Innovation **6 hrs**

Design Thinking in organisations, how to diffuse DT into work culture, Using DT to innovate in business, Disruptive innovation

TOTAL 30 hours

Reference Books:

1. Tim Brown, “Change by Design, Revised and Updated: How Design Thinking Transforms Organizations and Inspires Innovation”, Harper Business, 5th Edition, 2019.
2. Kelley, Tom, and Littman, Jonathan, The Art of Innovation : Lessons in Creativity from IDEO, America's Leading Design Firm (2016), Profile Books Ltd
3. Ling, Daniel (2015). Complete Design Thinking Guide for Successful Professionals, Emerge Creative Groups LLP
4. Kahneman, Daniel (2012). Thinking, Fast and Slow. (1st edn.), Penguin
5. Jeanne Liedtka. (2013). Solving Problems with Design Thinking – Ten Stories of What Works. (1st edn.), Columbia University Press

18GW37
SUSTAINABILITY LAB III

0 0 4 2

Learning Objective(s): To facilitate students to develop deep understanding of concepts by experiencing phenomena directly.

At the end of the course, the student should be able to:
CO1: Demonstrate knowledge on working and performance evaluation of various energy systems.
CO2: Display working knowledge of commercial CFD software for solving simple real-time problems.

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3		3
CO2	3	3		3		3

Energy Engineering
Performance evaluation of solar thermal system, Performance evaluation study of biomass digester/gasifier, Energy consumption and lumen measurement of lights and ballasts, Power quality measurements of electrical power systems, Performance evaluation of wind energy systems, Aerodynamic performance study of bluff and streamlined bodies.

Computational Fluid Dynamics
Flow simulation - Internal flow – Laminar region, Flow simulation - External flow – Laminar region, Flow simulation - Internal flow – Turbulence region, Flow simulation - External flow – Turbulence region, Flow simulation - Internal flow with heat transfer, Flow simulation - External flow with heat transfer.

TOTAL : 60 hrs

18GW41
INTERNSHIP III

0 0 8 4

Learning Objective(s): To develop and improve business skills in communication, technology, quantitative reasoning, and teamwork by observing and participating in business operations and decision-making.

At the end of the course, the student should be able to:
CO1: Integrate theory and practice.
CO2: Develop work habits and attitudes necessary for job success

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3	3	3
CO2	3	3		3	3	3

18GW42

Information and Communication Technology & Management Information Systems

3 0 0 3

Learning Objective(s): To create awareness about different types of information systems in an organization so as to enable effective decision making.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in Information and Communications Technology
CO2: Enumerate the components and types of Information Systems
CO3: Appreciate and uses Information Systems in operations and decision making
CO4: Utilise information resources and technology
CO5: Identify and assess security and ethical challenges with respect to information systems

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1		3		3		3
CO2				3		
CO3		3		3		
CO4	3	3		3	3	
CO5		3	3		3	3

UNIT I : ICTs **9 hrs**

Concept, Principles, and Scope of ICT in Rural Development, Introduction to IS, Technology and modern enterprise, Introduction to Computers, Computer Generations, Operating systems, Browsers: Google Chrome, Internet Explorer, Microsoft Office: MS Word, MS PowerPoint, MS Excel and MS-Project. Use of e-mail, Facebook, twitter and WhatsApp. Developing multi-media content and communication systems (DVD, CD, tele/video conferencing), ICT Applications in e-agriculture, e-awareness generation, e-banking, e-commerce, e-development, e- education, e-empowerment, e-entertainment, e-governance, e-health (human & veterinary), e-insurance, e-marketing, Applications of Local Area Portal (LAP) Software, Digital imaging and GIS mapping

UNIT II : Foundations of Information Systems **9 hrs**

A framework for business users - Roles of Information systems - System concepts - Organization as a system - Components of Information Systems - IS Activities; Types of IS. Strategy and technology, internet and telecommunications, e-commerce technologies

UNIT III : IS for operations and decision making **9 hrs**

Marketing IS, Manufacturing IS, Human Resource IS, Accounting IS and Financial IS - Transaction Processing Systems- Information Reporting System - Information for Strategic Advantage, internet marketing, web 2.0, SEO

UNIT IV : Managing Information Technology **9 hrs**

Managing Information Resources and technologies – IS architecture and management - Centralised, Decentralised and Distributed - EDI, Supply chain management & Global Information technology Management, Business process reengineering, BPM

UNIT V : Security and Ethical Challenges **9 hrs**

IS controls - facility control and procedural control - Risks to online operations - Ethics for IS professional - Societal challenges of Information technology, data, warehouse, and BT. Enterprise architecture, mobile computing, ethics.

TOTAL : 45 hrs

Reference Books:

1. James A O‟Brien, “Introduction to Information Systems”, Tata McGraw Hill, 14th Edition, 2008.
2. O‟Brien, J.A., and Marakas, G.M. Management Information Systems. (7th edn.), Tata McGraw Hill: India
3. Oz, E. (2008). Management Information Systems. (2nd edn.), India: Cengage Learning
4. Laudon, J.P and Laudon, K.C. (2007). Management Information System. (10th edn.), Pearson Education: India
5. Haag, S., Cummings,M., and Phillips, A. (2008). Management Information Systems. (6th edn.), Tata McGraw Hill: India

18GW43

WASTE MANAGEMENT AS PROJECT MANAGEMENT AND GEOGRAPHIC INFORMAITON SYSTEM

3 0 0 3

Learning Objective(s): To comprehend the special characteristics and problems in waste management and to apply various steps of project management in managing waste.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in project management
CO2: Enumerate the steps in starting a project
CO3: Make feasibility studies and execute projects
CO4: Monitor a waste-based project with emphasis on quality
CO5: Close out a project and perform auditing and follow-up

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3		3
CO2	3					
CO3	3	3		3	3	
CO4	3				3	3
CO5	3				3	

UNIT I : Projects in Contemporary Organizations **9 hrs**

Introduction to Project Management, Meaning of a project, relevance of project management principles for waste management. Project vs. operations, Roles and Responsibilities of Project Manager, Benefits of project management, Project lifecycle. Introduction of GIS and Remote Sensing in waste management applications. Familiarisation with ArcGIS, and open source software QGIS, Factors influencing waste disposal site, soil, water bodies, population density, scope, drainage, road.

UNIT II : Project Selection Techniques **9 hrs**

Beginning a project, Project Selection, Defining criteria, Project selection methods, Scope Definition, Project Charter development, Work break down structures, Project resources and scheduling, building a project schedule. Project Planning Tools (Bar charts, Logical Frame work approach, CPM, and PERT)

UNIT III : Project Development **9 hrs**

Project Execution, Monitoring through Information Systems, Project control, scope creep, Capital Cost Estimating, Monitoring Techniques and time control System, Project Cost Control and Time cost Trade-off, Project Procurement and Materials Management, Pre-Feasibility Study, Feasibility Studies, Project Break-even point.

UNIT IV : Monitoring a Waste-based Project **9 hrs**

Conflict Resolution, Team Management and Diversity Management, Change management, Quality, Quality Concepts, Risk Management- Risk identification, Qualitative risk analysis, Quantitative risk analysis, Risk planning, Risk control, Use of MS-Project Software for Project Planning and Monitoring, GIS

UNIT V : Project completion **9 hrs**

Project Close-out, Steps for Closing the Project, Project Termination, Project Follow-up, Project auditing, Case Studies for all the above Modules, should be incorporated as per the current requirements of the course.

TOTAL : 45 hrs

Reference Books:

1. Jack R. Meredith, Samuel J. Mantel, Jr., "Project Management", A Managerial Approach,Wiley, 1999.
2. Passenheim Olaf.,:"Project management". Ventus Publishing ApS. 2009.
3. PMBOK3 Guide. A guide to the Project management body of Knowledge, Project Management Institute). Newtown Square, PA, USA: Project Management Institute (PMI), 2000.
4. Robert K Wyoski, "Effective Project Management" , Wiley Int, 2016 ISBN: 1118729168

18GW44
CREATIVITY AND INNOVATION

3 0 0 3

Learning Objective(s): To enhance creative potential by strengthening various mental abilities and understanding ways of harnessing it for organizational excellence.

At the end of the course, the student should be able to:
CO1: Recall the different types of thinking and when they are used
CO2: Describe the factors that enhance general creativity
CO3: Explore opportunities for creativity in businesses
CO4: Design conditions to promote creativity at work
CO5: Identify and assess favourable conditions for innovation in business

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1		3		3		3
CO2						3
CO3	3	3			3	3
CO4				3	3	3
CO5	3	3			3	3

UNIT I : Realms of Creativity **9 hrs**

Creativity-Concept-Convergent and Divergent Thinking-Creativity Intelligence-Enhancing Creativity Intelligence-Determinants of Creativity-Creativity Process-Roots of Human Creativity-Biological, Mental, Spiritual and Social-Forms of Creativity-Essence, Elaborative and Expressive- Existential, Entrepreneurial and Exponential.

UNIT II : Creative Personality **9 hrs**

Traits Congenial to Creativity- Motivation and Creativity-Strategies for changing Motivation-Creative Environment- Formative Environment and Creativity- Adult Environment- Environmental Stimulants-Blocks to Creativity-Strategies for unblocking Creativity.

UNIT III : Managerial Creativity **9 hrs**

Creative Manager-Techniques of Creative Problem Solving- Creative Encounters and Creative Teams- Perpetual Creative Organizations-Creative Management Practices-Human Resource Management, Marketing Management, Management of Operations, Management of Product Design and Growth Strategies.

UNIT IV : Management of Creativity **9 hrs**

Issues and Approaches to the Design of Creative Organizations-Policy frameworks-Organizational Design for Sustained Creativity-Mechanism stimulating Organizational

Creativity-Creative Diagnosing-Creative Societies-Necessity-Model of a Creative Society.

UNIT V : Innovation **9 hrs**

Nature of Innovation-Technological Innovations and their Management-Inter-Organizational and Network Innovations- Design of a Successful Innovative Organization-Training for Innovation-Management of Innovation-Agents of Innovation- Skills for Sponsoring Innovation.

TOTAL : 45 hrs

Reference Books:

1. Jone Ceserani, Peter Great wood- Innovation and Creativity, Crest Publishing House, New Delhi.
2. Clayton, Christensen- Innovation and the General Manager, McGraw Hill.
3. Margaret, A. White & Gary D. Bruton- The Management of Technology Innovation- A Strategic Approach
4. Praveen Gupta-Business Innovations in the 21st Century, S.Chand, 2008.
5. CSG Krishnama Charyulu & R.Lalitha- Innovation Management, Himalaya Publishing House, 2007.

18GW45
MANAGING CONTRACTS

0 0 2 1

Learning Objective(s): To expose students to the use of contracts in business context.

At the end of the course, the student should be able to:
CO1: Recall the fundamental concepts related to contracts.
CO2: Distinguish between the different types of contracts.
CO3: Know how and when to use special contracts
CO4: Draw up a business contract.
CO5: Understand the consequences of breaching contracts.

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3			3		
CO2	3			3		
CO3	3			3		
CO4	3			3		4
CO5	3		3	3		

UNIT I : Basics of Contracts **6 hrs**

Agreement vs contract-Communication-acceptance-revocation- consideration-express and implied promises-voidable, void, illegal, unenforceable contracts-fraud vs undue influence-mistakes by one party

UNIT II : Types of contracts **6 hrs**

Express contract-Implied contract-quasi contract-bilateral contract- unilateral contract-contingent contracts-compulsory contracts

UNIT III : Indemnity, guarantee, Bailment **6 hrs**

Pledge and Agency - Rights of indemnity holder-guarantee components-various cases in guarantee-bailor and bailee-various cases in bailment-pawner and pawnee-agent and principal-sub agent-revocation and termination- rights of agent

UNIT IV : Drawing up a contract **6 hrs**

Purchase and sales contract-employment contracts-Service contracts-Lease contracts-Outsourcing contracts-non disclosure contracts-non competing contracts

UNIT V : Breach of contracts and Remedies **6 hrs**

Rescinding contract-compulsory execution-penalty for damages- initiating legal process as remedy

TOTAL : 30 hrs

Reference Books:

1. Bangia, R K, (2015),"Indian Contract Act", 14th Ed, Allahabad Law Agency
2. Rajkumar, C A; Adukia, S (2012),"Drafting commercial contracts and agreements", 1st Ed, Aisa Law House
3. Nabhi's Board of Editors, (2014),"Legal Drafting for Layman", Nabhi Publications
4. Saha, Tushar Kanti (2016), "Law of contract: Theories and Principles", 1st Nexis Ed, Universal Law Publishing-an imprint of Lexis
5. Kumar, H L, (2016), "Legal Drafting: Do it Yourself", 4th Ed, Universal Law Publishing-an imprint of Lexis Nexis

18GW46

THROUGHPUT ACCOUNTING AND THEORY OF CONSTRAINTS

0 0 2 1

Learning Objective(s): To enable students to use the concepts of throughput accounting and theory of constraints in an organisational setting.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in theory of constraints
CO2: Outline the basics of throughput accounting
CO3: Solve problems related to throughput accounting
CO4: Develop well defined strategies using strategy and tactic trees
CO5: Demonstrate an understanding of tools for analysis

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3					3
CO2	3	3		3		
CO3	3	3		3	3	3
CO4	3	3			3	3
CO5	3	3		3	3	

UNIT I : Introduction to TOC **6 hrs**

Theory of constraints-History of productivity–- Philosophies of TOC- -Goal of an organization-Appreciation of variability and dependency. Pillars (Inherent simplicity, Goodness of people, no conflict existence). Five focusing steps- Type of Constraints. Methods of TOC-An overview

UNIT II : Throughput Accounting Basics **6 hrs**

Throughput accounting -TOC Measurements on Productivity-Throughput, Operating Expenses, Inventory – Problems on identification of the same from the financial transactions-Fundamental difference between TA -Cost accounting- Lean accounting-Cost world vs throughput world- Creating Monthly internal P&L statement in TA-Decision making based on exposed capacity. Throughput-margin per unit.

UNIT III : Ratios of TA **6 hrs**

Ratios of TA – T/unit, Throughput-margin per unit time on constrained resource, OE/t, Inventory turn, Productivity (TA) ratio, T/I, delta-T/delta-OE. Decision making on Product mix problems. Other ratios-Throughput per department, per employee and Primary ratio –cost ratios. Inventory Dollar days and Inventory Dollar days.

UNIT IV : Thinking Process **6 hrs**

Thinking process-Logically and clearly- Change and improvements-Six layers of resistance-Verbalizing the problems-Dettmer's categories of legitimate reservations- Destination: Goal tree- Strategy and tactic tree.

UNIT V : Analysis Tools **6 hrs**

Analysis and possible solution: Logical tree diagrams- Current Reality Tree, Evaporating cloud, Future Reality Tree. Execution of change: Pre-requisite trees. Transition and progress- Action tree diagram-Network chart-Gantt chart-Fever chart. Necessity vs Sufficiency.

TOTAL : 30 hrs

Reference Books:

1. Corbett, T. (1998). Throughput accounting: TOC's management accounting system. Great Barrington: North river press.
2. Dettmer, H. W. (2007). The logical thinking process. A Systems Approach to Complex Problem Solving. American Society for Quality.
3. DugDale, D., & Jones, T. C. (1998). Throughput accounting: transforming practices?. The British Accounting Review, 30(3), 203-220.
4. Bragg, S. M. (2012). Throughput accounting: a guide to constraint management. John Wiley & Sons.

18GW47
SUSTAINABILITY LAB IV

0 0 4 2

Learning Objective(s): To facilitate students to develop deeper understanding of concepts by experiencing phenomena directly.

At the end of the course, the student should be able to:
CO1: Perform sampling, auditing and segregation of waste
CO2: Design composting and anaerobic digestion cycles for waste

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3				3	3
CO2	3	3			3	3

Organic Waste Management :

Waste auditing: Sampling, auditing, segregation; Waste Characterization: Physico-chemical and Biological analysis, Proximate and Ultimate analysis; Mini-Project: Composting: Setting up of composting, monitoring parameters, evaluation of composting; Mini-project: Anaerobic digestion: Setting up of the reaction, monitoring and evaluation of the gas evolved

TOTAL : 60 hrs

ELECTIVE COURSES

18GWA1
OPERATIONS AND MAINTENANCE

3 0 0 3

Learning Objective(s): To understand about operations in waste management methods and techniques and to address environmental hygiene and safety.

At the end of the course, the student should be able to:
CO1: Recollect waste management methods and techniques
CO2: Maintain plant operations and manage contingencies
CO3: Organise collection and storage of solid waste
CO4: Monitor and regulate daily operations of solid waste management
CO5: Utilise software tools for monitoring and control

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3		3
CO2	3				3	
CO3	3					
CO4	3					
CO5	3	3			3	

UNIT I : Waste Management methods and techniques **9 hrs**

Waste Management methods and techniques, government priorities, local involvement, Management of Collectives, NGOs, political will, community mobilization, resolving bottle necks, addressing environmental hygiene and safety

UNIT II : Operation and maintenance **9 hrs**

Operation and maintenance – importance, Monitoring plant operation in the central control room, actively employing local residents, Conducting a daily equipment inspection, Waste crane operation, Loading bulky waste, Operations Management/Maintenance manuals/plans, and Environmental Health and Safety Contingency Plans, Facility/System day-to-day operations protocol /procedures, Site and equipment maintenance schedule / regime, Staff/operator training in facility operations, & environmental health and safety, Record keeping and Reporting

UNIT III : Waste Collection & Transport **9 hrs**

Collection & storage of Municipal solid waste, Methods of collection – House to House collection, Community bins, Collection routes, Manpower requirement on- site storage methods, transfer station, transportation methods, mechanical methods – with or without compaction, economy in transportation, waste optimization of transport routes, Replacing, repairing, track recording of vehicles, machinery

UNIT IV : Daily operations **9 hrs**

Daily operations including recording and reporting data, maintenance data, operational record data, Access Control and Hours of Operation, Regulation of Scavenging, Burning for Volume Reduction, Landfill Operation, Control of Windblown Debris, Control of Fire, Release to the Receiving Environment, Troubleshooting and Resolving Safety, Service, and Operational Issues Maintain and distribute department related information on a daily basis. Predictive Maintenance- Waste management equipments, life cycles, capacity, labor effort cost, predictive methods

UNIT V : Usage of tools **9 hrs**

Usage of software tools to manage a variety of tasks, such as procurement, time and attendance, safety incidents, contract labour, Data collection and reporting required for incentive pay programs, processing of payments and other financial tasks as necessary, implementation of operational projects, employees scheduling and work assignments, Facility Maintenance & Renovation, Inspection and Monitoring, Odour Management Program, Vector (rodents, flies, other) Control Programs, siting, design, construction, operation, and decommissioning of waste management facilities, reduce and mitigate adverse environmental impacts associated with management of waste material; Predictive Maintenance- pro-data science and information age

TOTAL : 45 hrs

Reference Books:

1. Central Pollution Control Board , “Municipal Solid Wastes Processing Technologies: Reference Manual for Local Bodies”, New Delhi, 2002.
2. Govt of India, “Salient Features of Solid Waste Management Rules 2016”, New Delhi, 2016.
3. Ministry of Urban Development, Govt of India , “Municipal Solid Waste Management Manual”, New Delhi, 2016.
4. Central Pollution Control Board , “National Action Plan for Municipal Solid Waste Management”, New Delhi, 2015.

18GWA2

ENVIRONMENT IMPACT ASSESSMENT

3 0 0 3

Learning Objective(s): To provide insights in to the conduct of waste audit and environment impact assessment and application.

At the end of the course, the student should be able to:
CO1: Recall the objectives and scope Environmental Impact Assessment
CO2: Develop impact predictions and mitigation measures
CO3: Create strategic assessments and environmental management plans
CO4: Conduct waste audits according to international standards
CO5: Recollect about conventions pertaining to waste management and their outcomes

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1		3				3
CO2	3				3	
CO3	3	3			3	
CO4	3				3	
CO5	3	3	3			

UNIT I : Introduction **9 hrs**

Definition, Background, Objectives, Scope of EIA, Policies, Legal and Institutional framework, Guidelines EIA for Waste Management, checklists for Impact Assessment in Waste Management; Social Impact Assessment

UNIT II : Fundamentals of EIA **9 hrs**

Fundamentals of EIA, Steps in EIA, Predication of Impacts, Evaluation, Mitigation measures, Public Hearing, EIA Report, Monitoring Audits, Assessment Methodology, Identification of Potential Sources of Impact, Costs of EIA; Social Perspective

UNIT III : Environmental Assessment **9 hrs**

Strategic Environmental Assessment (SEA), EIA in India, Environmental Management Plan (EMP), Applications of EIA specific to this course – to site dump yards and landfill areas

UNIT IV : Waste Audit **9 hrs**

Introduction, Definition, Objectives of Audit,Steps in Waste Audit, Management through Environmental Audit: ISO 14000, 14001; Quality of the implementation process, Environmental Management benefits Implementing Certification Maintaining your ISO 14001, ISO 9000:2015 Principles of Quality Management

UNIT V : International Agreements on Waste **9 hrs**

MARPOL Convention, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Joint Convention, Convention on Nuclear Safety, National Waste Management Systems

TOTAL : 45 hrs

18GWA3

COST OF NON-MANAGEMENT OF SOLID AND LIQUID WASTE

3 0 0 3

Learning Objective(s): To calculate, study and report the socio-economics of neglecting waste management and environmental hygiene, and its cost to human health, the environment and the economy.

At the end of the course, the student should be able to:
CO1: Understand and list the ecological impacts of not managing waste
CO2: Enumerate the impacts of non-management of wastes on human life
CO3: Appreciate the social costs of not managing waste
CO4: Compute the economic impact of non-management or improper management of wastes
CO5: Design products and product life cycles which protect the environment

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3					
CO2	3	3			3	
CO3	3	3			3	
CO4	3	3			3	
CO5			3		3	3

UNIT I : Ecological Costs of Non-Management of Waste 9 hrs

Overview, Eco-economics, Valuation Techniques, Obsolescence - Strategies for improved durability of products, Ecological Cost – benefits, Ecological Cost of Waste Production, Pollution – types, threats to life forms, Activities that threaten biodiversity; remedies and solutions, waste of monoculture in farming – effect of burning rice straw instead of using it as fodder for cattle; pesticide waste residues; Strategies for ecological balance & maintenance; Remedial measures

UNIT II : Human Cost of Not Managing Waste 9 hrs

Introduction to Human Cost techniques for assessment; consequences of non-0management;Holistic meaning of Human Development, Measuring the burden of disease- DALY and QALY, Occupational and Environmental Health Hazards for Waste pickers, Vulnerability of citizens, Strategies for eliminating such costs, remedies and solutions

UNIT III : Social costs 9 hrs

Introduction to social costs; Vulnerability, Most vulnerable people in pyramid; Human

Development Costs, Littering costs, Plastic world – suffocating living beings, micro-plastics spread all over, Major Threats to Sustainability; Cultural & Ethical Costs with case studies; Strategies for eliminating social costs

UNIT IV : Economic Cost of Improper Waste Management **9 hrs**

Waste – to be contained at Source, Consumerism& it's effects, Efficiency of Resource Use-Production and Consumption, Environmental Taxes, Life Cycle Assessment, Cost- Benefit Analyses, economic comparison of waste storage and source management; costs of eliminating waste through small closed loop cycles; economic comparison of waste storage & source management; Economic & Business consequences in case of non-management

UNIT V : Product Stewardship **9 hrs**

Product Stewardship, Product Stewardship Act, Product Stewardship vs Extended Producer Responsibility, Voluntary product stewardship, Businesses and Product Stewardship, Consumers and Product Stewardship, Principles of Responsible Product Stewardship

TOTAL : 45 hrs

Reference Books:

1. Solid Waste Management - Present and Future Challenges - Jagbir Singh & AL Ramanathan
2. Waste Management Practices by John Pichtel
3. Solid wastes management by Stephen Burnley
4. Eco-Economy: Building an Economy for the Earth by Lester R.Brown
5. Not in My Backyard - Solid Waste Management in Indian Cities by SunitaNarain & Swati Singh Sambyal

18GWA4

HOTEL WASTE MANAGEMENT

3 0 0 3

Learning Objective(s): To understand the types of hotel wastes, ways to handle them and how to conduct waste audit in hotels.

At the end of the course, the student should be able to:
CO1: Recall the significance of hotel waste management
CO2: Distinguish between the different types of hotel waste
CO3: Organise waste management programs at hotels
CO4: Devise a food waste management strategy for hotels
CO5: Conduct audit of hotel wastes

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3					
CO2	3	3		3		
CO3	3		3	3	3	3
CO4	3	3	3		3	3
CO5	3		3		3	3

UNIT I : Introduction **9 hrs**

Importance of Hotel Waste Management, Objectives, actions needed on Waste Management, monitoring, designing the recovery system

UNIT II : Overview of Hotel Waste **9 hrs**

Overview of Hotel Waste, Types of Waste in Hotels, Steps of Effective Waste Management in Hotels, Benefits of Waste Reduction, Recognize role at different levels to manage waste, Importance of allocating budget for managing waste

UNIT III : Waste Management Program **9 hrs**

Organizing a Waste Management Program, Purchase Recycled Content Products

UNIT IV : Food Waste Management Strategy **9 hrs**

Food Waste Management Strategy, Waste Types by Department/Activity in hotels, Staff Training & Communication

UNIT V : Audit **9 hrs**

Auditing of Waste in Hotels, Performing Waste Audit, Tools to Conduct Waste Audit, Restaurant Food Waste Reduction Ideas

TOTAL : 45 hrs

Reference Books:

1. International Tourism Partnership (ITP) presents Green Hotelier – Know How Guide to Reducing and Managing Food Waste in Hotels, September 2014
2. Environmental Management for Hotels, The Industry Guide to Sustainable Operation 4 Waste First published 1993 | Third edition 2008 | Digital Release 2014 © International Tourism Partnership

18GWA5
RECLAMATION, REMEDIATION AND CAPPING

3 0 0 3

Learning Objective(s): To assess contamination and be aware of waste management technologies on reclamation, soil remediation and multi-criteria decision analysis.

At the end of the course, the student should be able to:
CO1: Assess and analyse contamination prior to remediation
CO2: List waste management technologies and understand when they are suitable
CO3: Develop landfill reclamation projects
CO4: Organise soil, water and air remediation
CO5: Perform multi-criteria decision analysis to generate alternatives for waste management

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3		
CO2	3				3	3
CO3	3				3	3
CO4	3				3	3
CO5	3	3		3		

UNIT I : Assessment of contamination before reclamation and remediation 9 hrs
Characterization of contamination and assessment of exposure, risk and resilience, Sample collection and analytical methods, Factors influencing risk assessment of contaminated site, Assessing exposure, risk and resilience

UNIT II : Waste Management Technologies 9 hrs
Eco Friendly Waste Management Technologies, Reclamation, Overview of Bioremediation Technologies; Microbial Bio-remediation & Myco-remediation; Phytoremediation; Introduction to Phytoremediation, Plant processes, Different phytoremediation methods, Phytoremediation - Design considerations, microbial bioremediation and myco remediation

UNIT III : Landfill Reclamation 9 hrs
Landfill reclamation projects, Waste Lands-Classification and Reclamation, Use of waste as Filling, Material in Land Reclamation, Criteria Approach, and Implementation analysis – Land reclamation, Implementation of Land Reclamation Sample Check-Points, Land Reclamation – Scenario Development

UNIT IV : Bio Remediation **9 hrs**

Soil resources and bioremediation, Soil Restoration and Night Soil Management, Soil remediation technologies, Classification of Soil Remediation Technologies, Bio-mining, Capping, Gas Recovery, Power Generation and Landfills, Remediation of water and air.

UNIT V : Multi-Criteria Decision Analysis (MCDA) **9 hrs**

Multi-Criteria Decision Analysis or Multi-Criteria Decision Making (MCDM), Methodological process and criteria options, Identification and implementation of waste options/alternatives

TOTAL : 45 hrs

Reference Books:

1. Guerriero, J.R. 1994. Landfill Reclamation and Its Applicability to Solid Waste Management. Landfill Reclamation Conference, Lancaster, PA.
2. Sharma, H. D., and Reddy, K. R. (2004). Geo-environmental engineering: site remediation, waste containment and emerging waste management technologies.Wiley, Hoboken, N.J.
3. Singh SN, Tripathi RD (2007) Environmental bioremediation technologies, Springer-Verlag Berlin Heidelberg.

18GWA6
SANITATION AND HYGIENE

3 0 0 3

Learning Objective(s): To gain a basic understanding of sanitation and hygiene, faecal sludge treatment and construction of sanitation facility.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in sanitation and hygiene
CO2: Outline features of toilets and their modifications for different situations
CO3: Appreciate and devise methods for faecal sludge treatment
CO4: Design sanitation infrastructure based on available resources
CO5: Promote community sanitation

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1		3		3	3	3
CO2						3
CO3		3				3
CO4	3		3		3	3
CO5			3			3

UNIT I : Sanitation and Hygiene **9 hrs**

Sanitation and Hygiene – definitions, scope, importance, its link with health, relation with economic development, specific areas to focus, effects of poor sanitation, Sanitation ladder – sanitation technologies

UNIT II : Toilets **9 hrs**

Proportion and Number of toilets, Gender sensitive sanitation facilities, Ramps for differently abled, Types–Indian, Western; Latest technologies in Toilet infrastructure with emphasis on feasibility of usage, maintenance and sustainability

UNIT III : Faecal Sludge treatment **9 hrs**

Faecal Sludge treatment -Single /twin pit, EcoSan, Septic tank, Formal sewerage, Sanitation infrastructure Status evaluation; Robust decentralised /centralised solutions including, source segregation, composting and recycling, Zero Waste Institution; Wastewater technologies to separate black and grey water, waste water treatment methods, Quality of treated water, Sludge management treatment and wetland treatment

UNIT IV : Sanitation Infrastructure **9 hrs**

Evaluation of Construction and Maintenance of Community, Public, Institutional and

Individual Sanitation Infrastructure, Levels of investment, Resource Allocation, Subsidies for sanitation, Sanitation marketing

UNIT V : Community Sanitation **9 hrs**

Community Sanitation, Maintenance of Community Toilets, IHHL procedures, Promotion of Sanitation & Hygiene, Capacity Building at Community level, Subsidy Mechanism, Working with Communities & households

TOTAL : 45 hrs

Reference Books:

1. Rural water supply and sanitation by S Gupta, Vayu Education of India
2. Manual on liquid and solid waste management by UNICEF and Ministry of drinking water and sanitation
3. Eulers and steel- municipal and rural sanitations by McGrawHill

18GWB1
MARKET INTEGRATION FOR WASTE MANAGEMENT

3 0 0 3

Learning Objective(s): To understand the sales & distribution functions as an integral part of marketing functions in a business firm.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in sales and distribution management
CO2: Describe the personal selling process
CO3: Manage and motivate the sales force
CO4: Distinguish between the different marketing channels and their appropriateness for different situations
CO5: Devise and monitor supply chains

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3			3		
CO2	3					
CO3	3		3		3	
CO4	3	3		3	3	3
CO5	3				3	3

UNIT I : Introduction to sales and distribution Management **9 hrs**
Nature and scope of sales management, personal selling objectives, Types of sales management positions, theories of personal selling, personal selling strategies, sales forecasting and budgeting decisions, emerging trends in selling, ethical leadership, case analysis

UNIT II : Personal selling process, sales territories and quotas **9 hrs**
Selling process, relationship selling, designing sales territories, sales quotas and sales organization structures, case analysis.

UNIT III : Sales Force & Distribution Management **9 hrs**
Sales Force Management: Recruitment and selection of sales force, training, motivating and compensating the salesforce, controlling the salesforce, case analysis.

UNIT IV : Distribution Management **9 hrs**
Introduction, need and scope of distribution management, marketing channels strategy, levels of channels, institutions for channel-retailing wholesaling, designing channel systems, channel management, case analysis.

UNIT V : Management of logistics & SCM **9 hrs**

Definition & Scope of logistics, Components of logistics, inventory & warehouse management, transportation, channel information systems, Extension into Supply Chain Management distribution management in international market. Online market places- B2B, B2C, C2C, online auction, specific online market places for energy, construction, recycling, reuse, government market places

TOTAL : 45 hrs

Reference Books:

1. Spiro – Stanton Rich – Management of Sales Force, TATA Mcgraw Hill Co.
2. Richard R Still and Others – Sales Management,
3. Rosen bloom: Marketing Channels, Cengage Learning.
4. Shah, J, "Supply Chain Management", 2009, 1st Ed. Pearson.
5. Electronic commerce by Gary Schnider

18GWB2
CONSUMER BEHAVIOR

3 0 0 3

Learning Objective(s): To understand how consumers make purchase decisions.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in consumer behaviour
CO2: List the internal determinants of consumer behaviour
CO3: Identify and enumerate the external determinants of consumer behaviour
CO4: Understand and influence the consumer decision making process
CO5: Devise customer relationship management programs for different businesses

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3			3		
CO2	3	3				
CO3	3	3				
CO4	3	3		3	3	3
CO5	3		3		3	3

UNIT I : Introduction to Consumer Behaviour **9 hrs**
Concept- Types of consumers- Current trends in consumer behaviour- Approaches to studying consumer behaviour- Inter- disciplinary analysis- Consumer Behaviour applications in designing marketing strategies- Problems in studying consumer behaviour.

UNIT II : Internal Determinants of Consumer Behaviour **9 hrs**
Motivation- Learning- Perception- Attitude- Personality and Lifestyle.

UNIT III : External Determinants of Consumer Behaviour **9 hrs**
Family- Social Class- Reference Group and Opinion Leader- Diffusion of innovations- Culture and subculture- Relationship marketing.

UNIT IV : Consumer decision making process **9 hrs**
Consumer Decision Making Process and Models: Howard Sheth Model- EKB Model- Organizational Buyer Behaviour and Influences on Organizational Buyer Behaviour, Post purchase behaviour, Consumer Dissonance, Post- purchase cognitive dissonance.

UNIT V : CRM concept and components **9 hrs**
Evolution, development & challenges in implementing CRM Organization for CRM, CRM Strategy cycle – CRM Program measurement and Tools – CRM practices in Banking,

Insurance and Retail. Emerging trends- emerging issues, past, and present marketing apps.

TOTAL : 45 hrs

Reference Books:

1. Schiffman & Kumar, “Consumer Behaviour”, 11th edition, Pearson Education India, 2017

2. East, R., Wright, M. & Vanhuele, M, “Consumer Behaviour: Applications in Marketing”, 2nd edition, SAGE Publication, 2016.

3. Motherbaugh & Mookerjee, “Consumer Behaviour: Building Marketing Strategy”, 12th Edition, Mcgraw Hill Education (India) Private Limited, 2018.

4. Ramanuj Majumdar, “Consumer Behaviour: Insights from Indian Market”, Kindle Edition, PHI, 2017.

5. Satish K Batra&Kazmi, “Consumer Behaviour”, 2Rev Ed edition, Excel Books, 2018.

18GWB3
INTEGRATED MARKETING COMMUNICATION

3 0 0 3

Learning Objective(s): To understand about the various marketing communication tools and their effectiveness.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in integrated marketing communication
CO2: Identify the elements in the communication process
CO3: Devise an approach for marketing communication
CO4: Develop a complete ICM program
CO5: Measure and control marketing programs through tools

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1				3		
CO2				3		
CO3	3			3	3	3
CO4	3			3	3	3
CO5	3	3		3	3	3

UNIT I : Introduction to IMC **9 hrs**

IMC – Definition and role, Global Developments in IMC, Introduction to IMC tools and techniques, Marketing Objectives and IMC, Strategies by waste and recycling industry

UNIT II : Understanding Communication Process **9 hrs**

Introduction to the communication process, Identifying important elements in communication, Information processing approaches and human cognition, AIDA model, Hierarchy of effect model and the Innovation adoption curve

UNIT III : Planning for Marketing Communication (Marcom) **9 hrs**

Establishing Marcom Objectives and Budgeting for Promotional Programs-Setting communication objectives, Sales as Marcom objective, DAGMAR approach for setting ad objectives. Budgeting for Marcom-Factors influencing budget, Theoretical approach to budgeting viz. Marginal analysis and Sales response curve, Method to determine Marcom budget.

UNIT IV : Developing IMC Programs **9 hrs**

Planning and development of creative Marcom. Creative strategies in advertising, sales promotion, publicity, event sponsorships etc. Creative strategy in implementation and

evaluation of Mrcom- Types of appeals and execution styles. Media planning and selection decisions- steps involved and information needed for media planning

UNIT V : Measuring effectiveness and Control of Promotional Programs 9 hrs

Meaning and importance of measuring communication effectiveness, the testing process, measuring the effectiveness of other promotional tools and IMC. The ethical, social, and legal aspects of advertising and promotion-, Social Communication Different legislative and self regulatory codes controlling advertising and promotions in India viz. advertising councils code, print media codes, broadcasting media codes and regulations governing sales promotion, packaging, direct marketing and internet marketing.

TOTAL : 45 hrs

Reference Books:

1. Broderick, Amanda, and David Pickton. Integrated marketing communications. Pearson Education UK, 2005.
2. Schultz, Don E., and Philip J. Kitchen. Communicating globally. McGraw Hill Professional, 2000.
3. Varey, R. J., “Marketing communication: principles and practice”. Psychology Press. Journal of Advertising Research, vol 39, no.1, 2002.
4. Yeshin, Tony. "The integration of marketing communications." The marketing book (2003): 395.
5. Chaffey, Dave, and Fiona Ellis-Chadwick. Digital marketing. Pearson UK, 2019.

18GWB4
SERVICE MARKETING

3 0 0 3

Learning Objective(s): To become familiar with the concepts of service relationship management, role of intermediaries, challenges of distribution in large domestic markets and need for short-term and long-term customer engagement.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in services marketing
CO2: Position services by understanding consumers and markets
CO3: Plan and create service products
CO4: Design and manage service processes
CO5: Manage relationships and implement service strategies

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3		3		
CO2	3			3	3	3
CO3	3				3	3
CO4	3				3	3
CO5			3	3	3	3

UNIT I : Understanding Service Products **9 hrs**

Introduction, importance of services in economy, service environment, Why study services? Industries or the Service Sector? Powerful forces transforming service market; four broad categories of services-A service perspective, Services pose distinct marketing challenges, the traditional marketing mix applied to services, the extended services marketing mix for managing the customer interface, a framework for developing effective service marketing strategies

UNIT II : Understanding Consumers and Markets **9 hrs**

Consumer Behaviour in service context, Positioning services in competitive markets, segmentation and targeting, purchase model

UNIT III : Apply the 4ps of Marketing to Services **9 hrs**

Apply the 4ps of Marketing to Services: Planning and creating service products, The flower of service, Branding service products and experiences, New service Development, Distribution in a services context, Distribution options for serving customer: Determining the type of contact, Place and Time Decisions, Delivering services in cyberspace, The role of intermediaries, The challenges of Distribution in large domestic markets, Distributing services internationally, Setting price and implementing revenue management, Promoting services and educating customers

UNIT IV : Managing the Customer Interface **9 hrs**

Designing and managing service processes-Flowcharting customer service processes, Blueprinting, Service process redesign, Balancing demand and productive capacity-Fluctuations in Demand threaten profitability, crafting the service environment, managing people for service advantage

UNIT V : Implementing profitable Services Strategies **9 hrs**

Managing relationships and building loyalty-The search for customer loyalty, Understanding the customer firm relationship, the wheel of loyalty, Strategies for developing loyalty bonds with customer, Complaint Handling and Service Recovery, Improving Service Quality and Productivity, Striving for service leadership, Balancing demand and productive capacity-Fluctuations in Demand threaten profitability, Gap model 2 analysis

TOTAL : 45 hrs

Reference Books:

1. Anderson R. (2001): Customer Relationship Management, New York, McGraw Hill
2. Grover S.K. (2003): Marketing: A Strategic Orientation, New Delhi, S. Chand & Co.
3. Jain S.C. (2001): International Marketing, New Delhi, South-Western Thomson Learning
4. Service Marketing by Christopher Lovelock, Pearson Education

18GWB5
PRODUCT AND BRAND MANAGEMENT

3 0 0 3

Learning Objective(s): To become familiar with the concepts and practices in Product Management, Brand Management, Product Strategy, Product Planning, Product Offering and Brand equity.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in product strategy
CO2: Perform competitor and customer analysis
CO3: Develop processes for new product creation and product strategies
CO4: State the principles, types and models associated with branding
CO5: Create brand positioning and strategy

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3			3		
CO2	3	3		3	3	
CO3	3				3	3
CO4	3				3	
CO5	3	3			3	3

UNIT I : Product and Product Strategy **9 hrs**
Introduction to Product and: Product Strategy and Planning, Product and Market Focused Organizations, Product and Market Evolution, Product Life Cycles, Branding (to create awareness on waste management)

UNIT II : Introduction to Competitive Structure **9 hrs**
Defining the Competitive Set, Category Attractiveness Analysis, Competitor Analysis and Customer Analysis.

UNIT III : Product Strategy, Product Offering and Analysis **9 hrs**
Developing Product Strategy, New Product Development, Designing the Offer, Market and Sales Potential, Pricing Decisions, Advertising and Promotion decisions, Concept and Product Testing, Financial Analysis for Product Management

UNIT IV : Brands, Branding and Brand Equity **9 hrs**
Introduction to Brands and Branding, Rationale for Building Brands, Types of Brands, Creating a Brand Designing Brand Identity using Kapferer's Identity Prism, Customer Brand Building Equity Model, Strategic Brand Wheel and Maps, Brand Mantras,

Organization and Branding, Brand Equity and Building Brand Equity, Measuring Brand Equity.

UNIT V : Brand Positioning and Branding Strategy **9 hrs**

Brand Positioning, Consumer Behaviour, Crafting Brand Positioning Strategy, Building Marketing Programs for Brands, E-Branding and building Online Brands, Brand Strategies including Line and Category Extensions, Umbrella Branding and Managing the Brand Architecture

TOTAL : 45 hrs

Reference Books:

1. Product Management by Donald Lehman and Russell Winer, Tata McGraw Hill, Latest Edition
2. Product Management by Moore and Pessemier, McGraw International, Latest Edition
3. Strategic Brand Management by Kevin Keller, Pearson Education, Latest Edition
4. Brand Management, Principles and Practices by KirtiDutta, Oxford Publication, Latest Edition.

18GWB6

WASTE EXPORTS, PROCEDURES AND DOCUMENTATION

3 0 0 3

Learning Objective(s): To become familiar with the nature, procedures and documentation involved in export-import business and trade regulations.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts associated with exporting
CO2: Understand and enumerate the export procedure
CO3: Understand and utilize the different export documents
CO4: Interact with institutions for export related financial transactions
CO5: Devise risk mitigation methods

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1						3
CO2	3	3		3	3	
CO3	3			3	3	
CO4	3				3	
CO5	3	3			3	3

UNIT I : Meaning and definition of export **9 hrs**

Classification-strategy and preparation for export marketing- Export marketing Organizations-Registration formalities-IEC-RCMC-export licensing –selection of Export Product-Identification of Markets-Methods of Exporting-Pricing Quotations-Payment terms-letter of credit.

UNIT II : Export procedure **9 hrs**

Starting an export firm- selection of an export product, market and buyer- Registration procedure with sales Tax, Central exercise and various boards and councils. Quality Control and Pre-shipment; inspection concept scheme and procedures. Export Promotion Councils; Commodity Boards/Product Export Development Authorities; Specific Service Institutions

UNIT III : Export Documents **9 hrs**

EXIM code number-Elements of export contract-In co terms-Terms of payment and letter of Credit. Export Documentation: Types of documents-Transport, Negotiation and insurance documents. Processing of an Export Order: World Shipping: Structure, Liners and Tramps, Conference System Freight; and Structure. Containerisation and other developments, International Agreements and Conferences on Sea Transport. Concepts of Dry Port, Containerisation, Air Transport: International set-up, Freight rate structure. Role of Clearing and Forward Agents.

UNIT IV : Sources of finance **9 hrs**

Role of commercial bank, EXIM Bank, ECGC and others-Export Promotion Schemes-Insurance for Export-Types –export credit insurance

UNIT V : Risk Management **9 hrs**

Types of Risks-mitigation methods. Documentation for Availing Export Incentives – Duty Drawbacks. Foreign Exchange Regulations and Formalities; Role of State Trading Organizations in Foreign Trade, Export Processing Zones; Export Oriented Units and Export and Trading House Schemes

TOTAL : 45 hrs

Reference Books:

1. PK Khurana “Export Management”, Galgotia publishing company,
2. Rathor B.S, Export Marketing, Himalaya Publishing House
3. Foreign Trade Policy: Hand book of Export Procedure and Annual of the Ministry of Commerce, Government of India
4. Paras Ram “ Export : What, Where and How” Delhi, Anupam Publication
5. Export and Import Manual, Nabhi Publications, New Delhi.

18GWC1
E-WASTE MANAGEMENT

3 0 0 3

Learning Objective(s): To provide insights in to generation of e-waste, hazardous nature of e-waste and life cycle of electrical and electronic equipments.

At the end of the course, the student should be able to:
CO1: Enumerate the sources of E-Waste generation
CO2: Investigate ICT trends
CO3: Describe and analyse the adverse impacts of E-waste
CO4: Understand E-waste life cycle and regulations
CO5: Devise opportunities for recycling and refurnishing

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3					
CO2	3	3		3	3	3
CO3	3	3		3	3	
CO4	3	3		3	3	
CO5			3		3	3

UNIT I : Generation of E-waste **9 hrs**

Generation of E-waste& it's comparison with other countries; e-waste as fastest obsolete items; digitalization of nations; increase in e-waste amounts – trends & reasons; Classifications for E-waste; segregation of e-waste; e-waste identified 17 Sustainable Development Goals (SDGs); Planned Obsolescence; International E-waste Statistics, International Laws

UNIT II : Information and Communication Technology **9 hrs**

Information and Communication Technology (ICT) and EEE Consumption Trends, Expanding Networks, More Internet Users, and Online Businesses, Falling Prices

UNIT III : Hazardous nature of e-waste **9 hrs**

Hazardous nature of e-waste, E-waste in Waste Bins; Illegal dumping of E-waste; Urban Mining of E-waste, Potential value of raw materials in e-waste; toxicity of e-waste; public health impacts & environment impacts of e-waste Risk assessment due to e-waste on soil, air & water; extraction of valuable resources from e-waste techniques & potential applications

UNIT IV : Life cycle of EEE into e-waste **9 hrs**

Life cycle of EEE into e-waste, common e-waste management scenarios; Official Take-

Back System, Transboundary Movement of E-waste, Extended Producers Responsibility, EPR, Sustainable technologies for producers; International Laws on E-waste; Take-back Laws; necessity for government regulation; developed and developing nations; ; E-waste Legislation & comparison with other countries

UNIT V : Recycling & Refurnishing **9 hrs**

Recycling & Refurnishing: introduction; recycling of different types of e-waste, business opportunities in recycling, market consumer analysis profitability; product stewardship in EEE products; Industrial clusters; History of Metal Recycling; e-waste rules in India; Recycling Parties;
e-waste recycling in formal, informal sectors(business model)

TOTAL : 45 hrs

Reference Books:

1. The Global E-waste Monitor 2017, Quantities, Flows, and Resources Authored by Baldé, C. P. Forti, V.Gray, R. Stegmann, P. United Nations University
2. Book on E-waste by Royal Society of Chemistry
3. Economic & Political Weekly
4. Book “e-waste” by David M Barkch. Abdo publishing
5. The complete technology book on e-waste Recycling – NIIR

18GWC2

RESOURCE EFFICIENCY AND RESOURCE RECOVERY

3 0 0 3

Learning Objective(s): To provide insights into efficient resource utilisation and "waste to wealth" concepts like Life-cycle analysis(LCA).

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in resource utilization efficiency and recovery
CO2: Identify trends in consumerism
CO3: Promote ways to reduce the use and throw culture
CO4: Recollect the fundamentals of sustainability
CO5: Identify and devise ways to recover precious resources like water

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3					
CO2	3	3		3	3	3
CO3	3		3		3	3
CO4	3	3	3		3	
CO5	3	3	3		3	3

UNIT I : Introduction **9 hrs**

Introduction – Definitions, differences, advantages, Circular economy, Resource security, Ways to minimize impact on environment &societal burdens, Life-cycle analysis(LCA), Zero Waste Strategy, Improvements to administration, source separation and collection, reuse and recycling

UNIT II : Consumerism **9 hrs**

History, Advertising – a Vicious Trap; Problems with Consumerism, Efficiency of Resource Use- Production and Consumption, patterns of consumption, Eco- labels – importance, increasing eco-labels

UNIT III : Use & Throw Culture **9 hrs**

Disposable Products, Comfort vs. Cost of disposables, Higher Resource efficiency, thoughtless extensive use and disposal of resources, Changing habits, Promoting plastic free living, increase demand for recycled materials

UNIT IV : Building Sustainability **9 hrs**

Basic Principles Of Sustainable Waste Management, traditional reductionist approach, Role of EPR, Sustainable Materials Management, Living a Minimalist Lifestyle, Sustainable waste management an opportunity, not burden, Sustainable waste management

implementation requires – dedicated financial support and political will, Systems and processes that change organizations from managing wastes to a resource recovery system

UNIT V : Resource Recovery **9 hrs**

Resource recovery in the context of sanitation (waste water and human excreta) Toilet resources: nutrients (nitrogen and phosphorus), organic matter, energy and water, role of incentives in design of recycling programs, Energy recovery from waste Electricity from biodegradable (waste burning) power plant, industrial water reuse, Reuse of water from kitchen, and water basins for gardening and irrigation, recovery of methane gas from solid waste dumping sites for energy, reuse of plastic for road building-plastic road. Recovery of water- waste water treatment using constructed wetland techniques, removal of heavy metals using hydrophonic methods, utilisation of fly ash as bricks and use as cement component, sludge treatment- used as bio fertilizers. Urine as fertilizer, biogas from human excreta

TOTAL : 45 hrs

Reference Books:

1. Energy and Resource Efficiency without the tears by Niall Enright ,vol I and II
2. Waste Management Practices: Municipal, Hazardous and industrial by John Pichter, CRS Press, 2nd Edition
3. Wealth from Waste: Trends and technologies, 4th Edition, Banwari Lal and PriyanshuSarma

18GWC3
INTEGRATED WASTE MANAGEMENT

3 0 0 3

Learning Objective(s): To provide insights into Integrated Waste Management and business models for creating wealth from waste.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in integrated waste management
CO2: Appreciate and develop a life cycle perspective with respect to waste management
CO3: Design sustainable management approaches for waste
CO4: Creating opportunities for generating wealth from waste
CO5: Understand and develop appropriate business models to convert waste to energy

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3					
CO2	3	3			3	
CO3	3	3	3		3	3
CO4	3		3		3	3
CO5	3	3	3	3	3	3

UNIT I :Introduction **9 hrs**

Integrated Waste Management – basics, Elements in IWM, Characteristics of IWM, Strategic Planning for IWM, Implementing IWM, Importance of Integrated Solid Waste Management (ISWM), Goals, Functional Elements Priorities of Integrated Waste Management, Benefits of IWM for developing economies, Geographical Coverage of Integrated Waste Management

UNIT II : Life Cycle Perspective **9 hrs**

Understanding the Life Cycle Perspective, Generation Source Perspective, Stakeholders'/Management Perspective of Integrated Waste Management, Planning public involvement, Alternatives approaches, Development of the Integrated Waste Management Facility, Decentralised waste management

UNIT III : Sustainable management **9 hrs**

Designing Approaches to sustainable management of wastes covering all sources and all aspects, covering generation, segregation, transfer, sorting, treatment, recovery and disposal in an integrated manner, with an emphasis on maximizing resource use efficiency

UNIT IV : Wealth from Waste **9 hrs**

Wealth from Waste- consumers as active participants; an art for some; entrepreneurship for some; Social implications, Creating social and environmental dividends contributing healthy communities, From waste to food; articles out of waste; composting units; Refuse-derived fuels

UNIT V : Waste Collection and Processing **9 hrs**

Waste Collection, Inorganic Waste processing, Organic Waste processing, Building business models of creating wealth from waste and providing employment, Creating new opportunities for local economic development, Social and economic reflections on Waste for Energy, Increasing costs of W2E treatment (and disposal), Major concerns with Waste for Energy approaches, W2E is not a 'green' technology, Multinational funding of Waste to Energy.

TOTAL : 45 hrs

Reference Books:

1. Waste Management and Minimization – Integrated Waste Management - A. J. Nordone, P. R. White, F. McDougall, G. Parker, A. Garmendia, M. Franke Encyclopedia of Life Support Systems (EOLSS) Integrated Waste Management A. J. Nordone, P. R. White and F. McDougall Procter and Gamble, Newcastle, UK
2. Waste to Energy, Wasting Resources and Livelihoods, By Jutta Gutberlet
3. Wealth from Waste - Agricultural food and chemical Processing Waste by S.C.Bhatia

18GWC4
BIO MEDICAL WASTE MANAGEMENT

3 0 0 3

Learning Objective(s): To provide insights into prevention of transmission of communicable diseases and risk handling in healthcare.

At the end of the course, the student should be able to:
CO1: List the sources and types of biomedical waste
CO2: Enumerate the impacts of non-management of biomedical waste on life
CO3: Appreciate and identify the legislations concerned with biomedical waste
CO4: Create processes for managing different types of biomedical wastes
CO5: Identify and take steps to ensure good health and safety practices for handlers of bio medical waste

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3					
CO2	3				3	
CO3	3	3			3	
CO4	3				3	3
CO5	3		3		3	3

UNIT I : Sources of Biomedical Waste **9 hrs**

Overview of Biomedical Waste, Sources of Biomedical Waste, Categories of Biomedical Waste, definition of general and hazardous biomedical waste and diseases, Infectious waste, genotoxic waste, waste sharps, biomedical waste categories, categorization and composition of Biomedical waste Specification of materials, Colour coding, Sources of Health care wastes, Hospitals and health care establishments & other sources, Primary health care facilities- BMW management

UNIT II : Impacts on health **9 hrs**

Specific Communicable diseases, Diseases epidemiology and mode of transmission of disease and prevention, consequences and remedies, Health impacts of biochemical waste, Direct & indirect hazards, Potential health hazards, Persons at risk, Basic information about infection, Infection agents on organizations spread of infection and Hospital acquired infection, Communication about Workplace Hazards, Safety precautions for doctors, nurses, para-medical staff, waste handlers.

UNIT III : Legal aspects **9 hrs**

Legislation, policies and law regarding bio medical waste management, Biomedical waste management and handling rules, CPCB guidelines, (Central pollution control board) Safe

disposal of Radioactive waste rules, guideline of BARC, International Scenario World Health Organization guidelines on Management of wastes from Hospitals wastes, Hospital budget allocation for hospital waste management, Maintenance of records, annual report.

UNIT IV : Steps Involved in Biomedical Waste Management 9 hrs

Basic steps in Biomedical Waste Management, Segregation at the point of generation sharp Decontaminating/Disinfections unit or container for autoclaving Sharp waste containers for Collection and Storage and transportation autoclaving/ shredding /incineration /bio hazard symbols, Microwave, Hydropulbing, plasma torch, segregation, transport within the hospital to central waste management facility, CBWMTF- land requirement, facility requirement, Treatment and Disposal

UNIT V : Management and Administration 9 hrs

Collection of waste, Principles of Safe Handling, Infection control system in hospital, Needle sticks injury and other sharp injury and hospital policy for protection of health care workers, On site Pre-treatment of waste Mechanical Treatment & Chemical Disinfections store & Off-site transportation, Health & safety Practices Usage of protective equipment Occupational health programmers & safety practices, Emergency measures, Measures for Waste Minimization, Zero Waste Hospital, Stakeholders of Waste Management

TOTAL : 45 hrs

Reference Books:

1. Srishti., (2000). 5 th survey of medical waste disposal practices in health care units of Delhi. New Delhi.

18GWC5
WATER RESOURCE MANAGEMENT

3 0 0 3

Learning Objective(s): To provide insights into reducing water usage and improving quality of waste water.

At the end of the course, the student should be able to:
CO1: Provide an overview of water security issues
CO2: Enumerate responsibilities towards production and disposal of waste water
CO3: Identify alternate technologies for waste water treatment
CO4: Understand and implement clean water solutions
CO5: Monitor water, waste water, soil and solid waste

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3					
CO2	3				3	
CO3	3	3		3	3	3
CO4	3		3	3	3	3
CO5	3	3			3	

UNIT I : Water Issues **9 hrs**

Overview of Water Security, Inequitable Global Distribution of water, Water quality, Individual& Community responsibility towards water Management; Consequences of Water Pollution, Causes of Water Pollution, Types of Water Pollution, Biohazard, Radiation Hazard and Security Threat

UNIT II : Waste Water Management **9 hrs**

Individual responsibility towards wastewater production, Community responsibility towards waste water disposal, Municipal responsibility for treating waste water, Conventional Waste water treatment: Sewage Treatment Plants, Issues facing present day STPs, Treatment of Leachate from Waste Dumps; Used water treatment for homes & small organizations; community level or decentralized used water treatment-involvement of communities or Self Help groups

UNIT III : Alternative Technologies for Waste Water Treatment **9 hrs**

Alternative technologies for waste water treatment, Summary of waste water treatment technologies, Biological Nutrient Removal Systems, Sludge Management, Disinfection; Primary, Secondary & Tertiary Treatment of Water; Eco-friendly technologies in water treatment

UNIT IV : Clean Water Solutions **9 hrs**

Introduction, Ancient Water Technology, Rainwater Harvesting, Solution for Flood Management, Watershed Management, Urban Watershed Management, River Restoration, Water Reclamation, Individual Responsibility, Community Responsibility

UNIT V : Testing of Water, Waste Water, Soil and Solid Waste **9 hrs**

Importance of Water Monitoring; Water sampling techniques, Water analysis parameters, Microbiological Analysis, Toxicity Characteristic Leaching Procedure (TCLP), Soil Testing, Soil Sampling, soil monitoring, soil quality parameters, TCLP, treatment of leachate from dump-yards

TOTAL : 45 hrs

Reference Books:

1. Lankford, Bruce; Bakker, Karen; Zeitoun, Mark, Conway, Declan (2013). Water Security: Principles, Perspectives and Practices (Earthscan Water Text) 1st Edition, Routledge
2. World Health Organization and UN-Habitat 2018, progress-on-wastewater-treatment-2018.pdf
3. World Health Organization; 2018. Guidelines on Sanitation and Health. Geneva: Licence: CC BY-NC-SA 3.0 IGO.

18GWC6
WASTE MANAGEMENT BANKS

3 0 0 3

Learning Objective(s): To provide insights into how a waste bank can act as an intermediary institution for transforming trash into cash.

At the end of the course, the student should be able to:
CO1: Recall the significance of Waste Banks
CO2: Devise plans for reusing and recycling
CO3: Appreciate and create different types of banks
CO4: Streamline community based waste management efforts
CO5: Monitor and analyse the impact of waste banks in local economy

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3					
CO2	3		3		3	3
CO3	3		3		3	3
CO4			3		3	3
CO5	3	3			3	

UNIT I : Waste Banks **9 hrs**

New concept, Importance and need, turning kabadiwallahs into bankers – an organised sector, Waste circulation through waste bank, Advantages of waste banks

UNIT II : Reuse / Recycle methods **9 hrs**

Deposit waste, distribution, identification and linking with the needy humans – beggars, old age homes, orphanages; Food waste - supply to animal shelters, goshalas, piggeries; e-waste and plastic, other lethal waste – link with authorised specific dealers; Bio-degradable waste – compost and sell

UNIT III : Simple daily banks **9 hrs**

Clothes banks, books banks, toy banks, e – banks, Food banks, Scrap metals, MedicineBanks, Plastic banks, Household items bank, Furniture banks– connect to resale, recycle or reuse, drop off and buyback centre

UNIT IV : Community-Based Waste Management **9 hrs**

Community-Based Waste Management, Local Economic Development (LED), Community Economic Development (CED), Decentralized waste banks, trash banks, garbage banks

UNIT V : Leadership, Management and Incentives in Waste Banks **9 hrs**

Leadership, Management and Incentives in Waste Banks, Partnership in the Waste Bank, Impact of Waste Bank to Local Economy, Waste Bank as Household Waste Management, Motivate public through schemes of tax reduction, Safety of waste handlers – body equipment

TOTAL : 45 hrs

18GWC7

WASTE MANAGEMENT TECHNOLOGIES

3 0 0 3

Learning Objective(s): To provide insights into designing new and efficient waste management techniques.

At the end of the course, the student should be able to:
CO1: Recall the principles and concepts in waste management techniques
CO2: Enumerate and utilize alternate technologies at different scales
CO3: Design new techniques for material recovery
CO4: Propose composting, recycling and treatment methods for different types of waste
CO5: Suggest remediation techniques

COURSE OUTCOMES	PROGRAMME OUTCOMES					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3					
CO2	3	3			3	3
CO3	3		3		3	3
CO4	3	3	3		3	3
CO5	3	3	3		3	3

UNIT I : Waste Management Techniques **9 hrs**

Waste Management Techniques - Salient features, business profitability, environmental regulations and economic viability, product design for waste minimization, Waste Management interventions - generation, prevention, characterization, monitoring, treatment, handling, reuse and ultimate residual disposal of solid wastes, Household hazardous waste; environmental regulations, product design for waste minimization; waste management interventions; occupational risks in waste management techniques are more appropriate

UNIT II : Alternative Technologies **9 hrs**

Technological development, assess, analyse and material recycling systems with low environment loading and find better alternatives, Develop technologies for small & medium scale, techno-economic feasibility of proposed methodologies/ technologies, System to efficiently collect PET bottles, Biomass utilization technology, Home appliance recycling technology; Technological development, assess analyse material Recycling; Develop technologies for small & medium scale, techno-economic feasibility; Business utilization Science of recycling as waste categorization.

UNIT III : Designing New Techniques **9 hrs**

Green Product development and Design for recycling, Development of simple indigenous

material recovery technology for specific applications (precious & other metals, plastics, glass and rare earths). Newer technologies for Biomedical Waste, Urban & Rural Solid Waste, including Plastic Waste, E-Waste (Electrical & Electronics Waste): Recycling & Recovery, Resource recycling technology to produce high quality products; Green Product Development & design for recycling; development of simple material recovery; newer technologies- recycling topics can all form a separate unit

UNIT IV : Composting, Recycling & Treatment Methods **9 hrs**

Composting: Types and processes, Counter Current Management, Recycling: Changed form; Reducing: Compacting, Reusing: with and without recasting, Incineration and pyrolysis, gasification technologies.

UNIT V : Remediation **9 hrs**

Landfill Bio-reactor; Existing Landfills: Gas Extraction, Leachate Treatment, Material Mining, Remediation, Value-added Material Recovery, Non-recyclable packaging material, Construction & demolition debris, Co- digestion of sewage sludge; Landfills: Aerobic and semi aerobic, Earth Layer and HDPE liner, Capping of Waste; Basic design on requirements for engineered landfills; landfills vs dump - site

TOTAL : 45 hrs

Reference Books:

1. Central Pollution Control Board., (2007). Guidelines for the selection of site for landfilling. New Delhi.
2. CPCB (2000), “Status Of Municipal Solid Waste Generation, Collection, Treatment And Disposal in Class I Cities”, Central Pollution Control Board, Ministry of Forest and Environment, GOI, New Delhi
3. SWM (2016)manual by Ministry of Urban Development
4. Solid Waste Management by Arnie Resilind
5. Solid Waste Technology & Management by Thomas H Christene