

Maharashtra State Board Of Technical Education, Mumbai
Learning and Assessment Scheme for Post H.S.C Diploma Courses

Programme Name	: Diploma In Surface Coating Technology		
Programme Code	: SC	With Effect From Academic Year	: 2023-24
Duration Of Programme	: 6 Semester	Duration	: Internship - 16 weeks (6 - summer vacation + 10 - academic term) Term at Institute : 6 weeks
Semester	: Third	Scheme	: K

Sr No	Course Title	Abbreviation	Course Type	Course Code	Total IKS Hrs for Sem.	Learning Scheme					Credits	Paper Duration (hrs.)	Assessment Scheme										Total Marks
						Actual Contact Hrs./Week			Self Learning (Activity/ Assignment /Micro Project)	Notional Learning Hrs /Week			Theory			Based on LL & TL				Based on Self Learning			
						CL	TL	LL					FA-TH	SA-TH	Total		Practical		SLA				
															Max	Min	Max	Min	Max	Min			

(All Compulsory)																							
1	ESSENCE OF INDIAN CONSTITUTION	EIC	VEC	313026	-	3	-	-	2	5	1	-	-	-	-	-	-	-	-	50	20	50	
2	INDUSTRIAL PRACTICES	IDP	DSC	323017	-	-	-	4	1	5	1	-	-	-	-	-	50	20	25@	10	25	10	100
3	QUALITY MANAGEMENT SYSTEMS FOR PAINT INDUSTRIES	QMS	DSC	323018	-	-	-	8	2	10	2	-	-	-	-	100	40	50@	20	50	20	200	
4	INTERNSHIP (16 WEEKS)	IN16	DSC	323019	-	-	-	-	-	36 - 40	16	-	-	-	-	100	40	100#	40	-	-	200	
Total					0	3	0	12	5		20		0	0	0	250		175		125		550	

Abbreviations : CL- Classroom Learning , TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment,SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends : @ Internal Assessment, # External Assessment, *# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

Course Category : Discipline Specific Course Core (DSC) , Discipline Specific Elective (DSE) , Value Education Course (VEC) , Intern./Apprenti./Project./Community (INP) , AbilityEnhancement Course (AEC) , Skill Enhancement Course (SEC) , GenericElective (GE)

Note :- Internship 16 weeks (IN16) : 6 weeks shall be in summer vacation and 10 weeks from the academic term, totaling 16 weeks of internship. Remaining academic activities shall be completed in the institute in 6 weeks.

Programme Name/s : Surface Coating Technology
Programme Code : SC
Semester : Third
Course Title : ESSENCE OF INDIAN CONSTITUTION
Course Code : 313026

I. RATIONALE

This course will focus on the basic structure and operative dimensions of Indian Constitution. It will explore various aspects of the Indian political and legal system from a historical perspective highlighting the various events that led to the making of the Indian Constitution. The Constitution of India is the supreme law of India. The document lays down the framework demarcating the fundamental political code, structure, procedures, powers, and sets out fundamental rights, directive principles, and the duties of citizens. The course on constitution of India highlights key features of Indian Constitution that makes the students a responsible citizen. In this online course, we shall make an effort to understand the history of our constitution, the Constituent Assembly, the drafting of the constitution, the preamble of the constitution that defines the destination that we want to reach through our constitution, the fundamental right constitution guarantees through the great rights revolution, the relationship between fundamental rights and fundamental duties, the futurist goals of the constitution as incorporated in directive principles and the relationship between fundamental rights and directive principles.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

The aim of this course is to help the student to attain the following industry /employer expected outcome – Abide by the Constitution in their personal and professional life.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - List salient features and characteristics of the constitution of India.
- CO2 - Follow fundamental rights and duties as responsible citizen of the country.
- CO3 - Analyze major constitutional amendments in the constitution.
- CO4 - Follow procedure to cast vote using voter-id.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme						Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SL	H	NL			H	Theory			Based on LL & TL				Based on SL		
				CL	TL	LL							Total	Practical		SLA						
														FA-TH	SA-TH	FA-PR	SA-PR	SLA	SLA			
Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min											
313026	ESSENCE OF INDIAN CONSTITUTION	EIC	VEC	3	-	-	2	5	1	-	-	-	-	-	-	-	-	50	20	50		

Total IKS Hrs for Sem. : 0 Hrs

Abbreviations: CL- Classroom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	TLO 1.1 Explain the meaning of preamble of the constitution. TLO 1.2 Explain the doctrine of basic structure of the constitution. TLO 1.3 List the salient features of constitution. TLO 1.4 List the characteristics of constitution.	Unit - I Constitution and Preamble 1.1 Meaning of the constitution of India. 1.2 Historical perspectives of the Constitution of India. 1.3 Salient features and characteristics of the Constitution of India. 1.4 Preamble of the Constitution of India.	Presentations Blogs Hand-outs Modules Flipped classrooms Case studies
2	TLO 2.1 Enlist the fundamental rights. TLO 2.2 Identify fundamental duties in general and in particular with engineering field. TLO 2.3 Identify situations where directive principles prevail over fundamental rights.	Unit - II Fundamental Rights and Directive Principles 2.1 Fundamental Rights under Part-III. 2.2 Fundamental duties and their significance under part-IV-A. 2.3 Relevance of Directive Principles of State Policy under part-IV A.	Presentations Blogs Hand-outs Modules Case Study Flipped Classroom
3	TLO 3.1 Enlist the constitutional amendments. TLO 3.2 Elaborate the elements of Centre-State Relationship TLO 3.3 Analyze the purposes of various amendments.	Unit - III Governance and Amendments 3.1 Amendment procedure of the Constitution and their types - simple and special procedures. 3.2 The Principle of Federalism and its contemporary significance along with special committees that were setup. 3.3 Major Constitutional Amendment procedure - 1st, 7th, 42nd, 44th, 73rd & 74th, 76th, 86th, 52nd & 91st, 102nd	Cases of Federal disputes with relevant Supreme court powers and Judgements Presentations Blogs Hand-outs Problem based learning

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
4	<p>TLO 4.1 Explain the importance of electoral rights</p> <p>TLO 4.2 Write the step by step procedure for process of registration</p> <p>TLO 4.3 Explain the significance of Ethical electoral participation</p> <p>TLO 4.4 Explain the steps to motivation and facilitation for electoral participation</p> <p>TLO 4.5 Enlist the features of the voter's guide</p> <p>TLO 4.6 Explain the role of empowered voter</p> <p>TLO 4.7 Write the steps of voting procedure</p> <p>TLO 4.8 Write steps to create voter awareness</p> <p>TLO 4.9 Fill the online voter registration form TLO</p> <p>TLO 4.10 Follow procedure to cast vote using voter-id.</p>	<p>Unit - IV Electoral Literacy and Voter's Education</p> <p>4.1 Electoral rights , Electoral process of registration</p> <p>4.2 Ethical electoral participation</p> <p>4.3 Motivation and facilitation for electoral participation</p> <p>4.4 Voter's guide</p> <p>4.5 Prospective empowered voter</p> <p>4.6 Voting procedure</p> <p>4.7 Voter awareness</p> <p>4.8 Voter online registration https://www.ceodelhi.gov.in/ELCdetails.aspx</p>	<p>Presentations</p> <p>Hand-outs</p> <p>Modules</p> <p>Blogs</p> <p>Problem based Learning</p>

VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES : NOT APPLICABLE.

VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)

Assignment

- Outline the procedure to submit application for Voter-id

Assignments are to be provided by the course teacher in line with the targeted COs.

A1. Prepare an essay on Constitution of India.

A2 Prepare a comparative chart of Unique features of Indian Constitution of India and Constitution of USA

Assignments are to be provided by the course teacher in line with the targeted COs. A1. Prepare an essay on Constitution of India . A2 Prepare a comparative chart of Unique features of Indian Constitution of India and Constitution of USA A3. Self-learning topics: Parts of the constitution and a brief discussion of each part Right to education and girl enrollment in schools. GER of Girls and Boys. Right to equality. Social Democracy. Women Representation in Parliament and State Assemblies. LGBTQIA+

Micro project

- 1. Organize a workshop-cum discussions for spreading awareness regarding Fundamental Rights of the citizen of the country
- 2. Prepare elaborations where directive principle of State policy has prevailed over Fundamental rights with relevant Supreme Court Judgements.
- 3. Organize a debate on 42nd, 97th and 103rd Constitutional Amendment Acts of Constitution of India.

Seminar

- 1 Differences in the ideals of Social democracy and Political democracy.
- 2 Democracy and Women's Political Participation in India.

- 3 Khap Panchayat - an unconstitutional institution infringing upon Constitutional ethos.
 4 Situations where directive principles prevail over fundamental rights.

Group discussions on current print articles.

- -Art 356 and its working in Post-Independent India.
- Women's Reservation in Panchayat leading to Pati Panchayats - Problems and Solutions.
- Adoption of Article 365 in India.
- Need of Amendments in the constitution.
- Is India moving towards a Unitary State Model?

Activity

- Arrange Mock Parliament debates.
- Prepare collage/posters on current constitutional issues.
- i. National (Art 352) & State Emergencies (Art 356) declared in India.
 - ii. Seven fundamental rights.
 - iii. Land Reforms and its effectiveness - Case study of West-Bengal and Kerala.

Cases: Suggestive cases for usage in teaching:

- A.K. Gopalan Case (1950) : SC contended that there was no violation of Fundamental Rights enshrined in Articles 13, 19, 21 and 22 under the provisions of the Preventive Detention Act, if the detention was as per the procedure established by law. Here, the SC took a narrow view of Article 21.
- Shankari Prasad Case (1951) : This case dealt with the amendability of Fundamental Rights (the First Amendment's validity was challenged). The SC contended that the Parliament's power to amend under Article 368 also includes the power to amend the Fundamental Rights guaranteed in Part III of the Constitution. Minerva Mills case (1980) : This case again strengthens the Basic Structure doctrine. The judgement struck down 2 changes made to the Constitution by the 42nd Amendment Act 1976, declaring them to violate the basic structure. The judgement makes it clear that the Constitution, and not the Parliament is supreme. Maneka Gandhi case (1978) : A main issue in this case was whether the right to go abroad is a part of the Right to Personal Liberty under Article 21. The SC held that it is included in the Right to Personal Liberty. The SC also ruled that the mere existence of an enabling law was not enough to restrain personal liberty. Such a law must also be "just, fair and reasonable."
- Other cases:
1. Kesavananda Bharati Case (1973) : In this case the Hon. SC laid down a new doctrine of the 'basic structure' (or 'basic features') of the Constitution. It ruled that the constituent power of Parliament under Article 368 does not enable it to alter the 'basic structure' of the Constitution. This means that the Parliament cannot abridge or take away a Fundamental Right that forms a part of the 'basic structure' of the Constitution.
 2. Mathura Rape Case (1979) : A tribal woman Mathura (aged 14 to 16 years) was raped in Police Custody. The case raised the questions on the idea of 'Modesty of Woman' and here it was a tribal woman who succumbs to multiple patriarchies. Custodial rape was made an offence and was culpable with the detainment of 7 years or more under Section 376 of Indian Penal Code. The weight of proofing the allegations moved from the victim to the offender, once sexual intercourse is established. The publication of the victim's identity was banned and it was also held that rape trials should be conducted under the cameras.
 3. Puttswamy vs Union of India (2017) : In this landmark case which was finally pronounced by a 9-judge bench of the Supreme Court on 24th August 2017, upholding the fundamental right to privacy emanating from Article 21. The court stated that Right to Privacy is an inherent and integral part of Part III of the Constitution that guarantees fundamental rights. The conflict in this area mainly arises between an individual's right to privacy and the legitimate aim of the government to implement its policies and a balance needs to be maintained while doing the same.
 4. Navtej Singh Johar & Ors. v. Union of India (2018) : Hon. SC Decriminalised all consensual sex among adults, including homosexual sex by scrapping down section 377 of the Indian penal code (IPC). The court ruled that LGBTQ community are equal citizens and underlined that there cannot be discrimination in law based on sexual orientation and gender.
 5. Anuradha Bhasin Judgement (2020) : The Supreme Court of India ruled that an indefinite suspension of internet services would be illegal under Indian law and that orders for internet shutdown must satisfy the tests of necessity and proportionality. The Court reiterated that freedom of expression online enjoyed Constitutional protection, but could be restricted in the name of national security. The Court held that though the Government was empowered to impose a complete internet shutdown, any order(s) imposing such restrictions had to be made public and was subject to judicial review.

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicious mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED : NOT APPLICABLE**IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)**

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Constitution and Preamble	CO1	4	0	0	0	0
2	II	Fundamental Rights and Directive Principles	CO2	5	0	0	0	0
3	III	Governance and Amendments	CO3	5	0	0	0	0
4	IV	Electoral Literacy and Voter's Education	CO4	4	0	0	0	0
Grand Total				18	0	0	0	0

X. ASSESSMENT METHODOLOGIES/TOOLS**Formative assessment (Assessment for Learning)**

- Assignment, Self-learning and Terms work Seminar/Presentation

Summative Assessment (Assessment of Learning)**XI. SUGGESTED COS - POS MATRIX FORM**

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	1	-	-	-	2	-	-			
CO2	1	-	-	-	2	-	-			
CO3	1	2	-	-	2	-	1			
CO4	-	-	-	1	-	-	-			

Legends :- High:03, Medium:02,Low:01, No Mapping: -
*PSOs are to be formulated at institute level

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	P.M.Bakshi	The Constitution of India	Universal Law Publishing, New Delhi 15th edition, 2018, ISBN: 9386515105 (Check the new edition)
2	D.D.Basu	Introduction to Indian Constitution	Lexis Nexis Publisher, New Delhi, 2015, ISBN:935143446X
3	B. K. Sharma	Introduction to Constitution of India	PHI, New Delhi, 6th edition, 2011, ISBN:8120344197
4	MORE READS :	Oxford Short Introductions - The Indian Constitution by Madhav Khosla. The Indian Constitution: Cornerstone of a Nation by Granville Austin. Working a Democratic Constitution: A History by Garnville Austin Founding Mothers of the Indian Republic: Gender Politics of the Framing of the Constitution by Achyut Chetan. Our Parliament by Subhash C. Kashyap. Our Political System by Subhash C. Kashyap. Our Constitution by Subhash C. Kashyap. Indian Constitutional Law by Rumi Pal.	Extra Read
5	B.L. Fadia	The Constitution of India	Sahitya Bhawan, Agra, 2017, ISBN:8193413768

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://constitutionnet.org/vl/item/basic-structure-indian-constitution	Parts of constitution
2	https://www.concourt.am/armenian/legal_resources/world_constitutions/constit/india/india-e.htm	Parts of constitution
3	https://main.sci.gov.in/constitution	Directive principles
4	https://legallaffairs.gov.in/sites/default/files/chapter%203.pdf	Parts of constitution
5	https://www.toppr.com/guides/civics/the-indian-constitution/the-constitution-of-india/	Fundamental rights and duties
6	http://www.legislative.gov.in/constitution-of-india	Constitution overview
7	https://en.wikipedia.org/wiki/Constitution_of_India	Parts of constitution
8	https://www.india.gov.in/my-government/constitution-india	Constitution overview

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

Programme Name/s : Surface Coating Technology
Programme Code : SC
Semester : Third
Course Title : INDUSTRIAL PRACTICES
Course Code : 323017

I. RATIONALE

The industries of surface coating and allied industries evolved through many innovations and industrial practices recently. The course on Industrial Practices has been included to Diploma in Surface Coating Technology, which enables students to understand practices of Plant Layout, Plant Maintenance, Effluent Treatment Plant, Reuse, Recycling, Disposal and Inventory Management.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences: • Apply latest industrial practices in Surface Coating Industries.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Explain the concepts of plant layout and facility layout.
- CO2 - Justify autonomous, periodic and scheduled maintenance in plant.
- CO3 - Describe the process of effluent treatment.
- CO4 - Apply inventory management techniques

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH			Theory			Based on LL & TL				Based on SL			
				CL	TL	LL					Total	Practical		SLA							
												FA-TH	SA-TH	FA-PR	SA-PR	Max	Min				
323017	INDUSTRIAL PRACTICES	IDP	DSC	-	-	4	1	5	1	-	-	-	-	-	50	20	25@	10	25	10	100

Total IKS Hrs for Sem. : Hrs

Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	TLO 1.1 Describe concept of plant layout and facility layout. TLO 1.2 Classify types of layout TLO 1.3 Explain process layout for paint manufacturing.	Unit - I Plant Layout 1.1 Concept of plant layout and facility layout. 1.2 Types of layout 1.3 Process layout-paint manufacturing, paint application, powder coating, electroplating. 1.4 Evacuation plan layout	Lecturer Q&A Presentations Assignment Demonstration
2	TLO 2.1 Describe types of plant maintenance. TLO 2.2 Differentiate autonomous maintenance, periodic maintenance, scheduled maintenance.	Unit - II Plant Maintenance 2.1 Concept of maintenance-plant maintenance, preventive maintenance, process maintenance, tools and equipment for maintenance. 2.2 Autonomous maintenance, periodic maintenance, scheduled maintenance.	Group discussion Presentations
3	TLO 3.1 Explain types of effluent treatment. TLO 3.2 Describe process for effluent treatment. TLO 3.3 Draw ETP layout. TLO 3.4 Write regulations for ETP.	Unit - III Effluent Treatment Plant 3.1 Types of effluent treatment. 3.2 Process for treatment. 3.3 ETP layout. 3.4 Regulations for ETP. 3.5 Zero discharge plant.	Presentations Demonstration Lecture- Q&A Assignment
4	TLO 5.1 Describe concept of inventory management. TLO 5.2 Describe LIFO, FIFO, FILO and buffer stock TLO 5.3 Explain Inventory management techniques.	Unit - V Inventory Management 5.1 Concept of inventory management. 5.2 Importance of LIFO, FIFO, FILO and buffer stock. 5.3 Inventory management techniques. 5.4 Concept of VED, FSN, ABC analysis. 5.5 Significance of zero inventory.	Demonstration Flipped Classroom Presentations Lecture- Q&A

VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Prepare a layout for thinner storage, handling and mixing plant.	1	Preparation of process flow diagram for thinner storage, handling and mixing plant.	4	CO1
LLO 2.1 Design evacuation plan layout for surface coating industries.	2	*Development of evacuation plan layout for surface coating industries.	4	CO1
LLO 3.1 Prepare a paint manufacturing and paint application plant layout.	3	Preparation of plant layout for paint manufacturing and paint application industries.	4	CO1
LLO 4.1 Carry out a preventive maintenance of sand mill.	4	*Preparation of checklist and report for preventive maintenance of sand mill.	4	CO2
LLO 5.1 Conduct preventive maintenance of spray booth.	5	Conduction of preventive maintenance of spray booth.	4	CO2
LLO 6.1 Carry out a preventive maintenance of oven.	6	Carry out a preventive maintenance of oven.	4	CO2
LLO 7.1 Conduct a effluent treatment on given effluent sample	7	Preparation of experimental set-up and conduct of effluent treatment.	4	CO3
LLO 8.1 Design a ETP layout for given surface coating industries.	8	*Preparation of ETP layout for given surface coating industries.	4	CO3
LLO 9.1 Conduct the inventory of given paint materials.	9	*Prepare a inventory report of given sample of paint materials.	4	CO4
LLO 10.1 Conduct VED analysis of given items.	10	Carry out VED analysis of given items.	4	CO4

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
Note : Out of above suggestive LLOs -				
<ul style="list-style-type: none"> * Marked Practicals (LLOs) Are mandatory. Minimum 80% of above list of lab experiment are to be performed. Judicial mix of LLOs are to be performed to achieve desired outcomes. 				

VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)

Micro project

- Micro project- I: Prepare a report on plant layout in surface coating industries. a. Search plant layout methods / practices /procedure in the industry/ field. b. Draw details plant layout and component/equipment c. Prepare report (10-15 pages) with enclosures of photograph and references.
- Micro project- II: Prepare a report on Effluent treatment process. a. Visit effluent treatment plant b. Describe details of ETP plant with component/equipment/process /machines / chemicals etc. c. Prepare report (10-15 pages) with enclosures of photograph and references.

Assignment

- Assignment- I: Case study on inventory management a. Write a case study of inventory management practice in surface coating industries. b. Describe LIFO, FIFO, FILO for inventory management. c. Prepare report/Case (10-15 pages) with enclosures of photograph and references.

Term Work

- Term Work: Prepare a journal consisting: a. List of laboratory experiences performed for Industrial Practices. b. For each practical, perform write (Scope, chemicals, instruments, process, observations, diagram, calculations and result.) c. Arrange chronologically. d. Prepare report for submission.

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Sand mill	4
2	Automatic muller	4
3	Ball Mill	4
4	Tool Box	4,5,6
5	Spray booth	5
6	Spray gun	5
7	Oven (300 Oc)	6
8	ETP bath	7
9	Weighing balance (upto 500gm)	7
10	MS panel (7*15cm)	All

IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table) : NOT APPLICABLE**X. ASSESSMENT METHODOLOGIES/TOOLS****Formative assessment (Assessment for Learning)**

- Terms work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- Lab. performance
- Viva-voce
- Lab. performance

XI. SUGGESTED COS - POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	2	1	-	-	1	-	2			
CO2	2	2	1	-	1	-	2			
CO3	2	1	1	2	1	2	2			
CO4	2	1	1	-	1	-	2			

Legends :- High:03, Medium:02,Low:01, No Mapping: -
*PSOs are to be formulated at institute level

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	G K Agarwal	Plant Layout & Material Handling	Jain Brother; Latest, 2017 edition ISBN:9788186321782
2	S.C. Sharma	Plant Layout and Materials Handling	Khanna Publishers ISBN:978817409-319-6
3	Duncan Richardson	Plant Equipment & Maintenance Engineering Handbook	McGraw-Hill Education; 1st edition ISBN: 9780071809894
4	Er. R. K. Jain	Plant Maintenance Engineering and Management	Khanna Publishers; ASIN: B07HVRFF7V
5	A.D. Patwardhan	Industrial Wastewater Treatment (2nd Edition)	PHI Learning; ISBN: 9788120353329
6	John Arundel	Sewage And Industrial Effluent Treatment (2nd Edition)	Wiley India Pvt Ltd; ISBN: 9788126542253
7	Max Muller	Essentials of Inventory Management (2nd edition)	AMACOM; ISBN: 9780814416556

XIII. LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
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Sr.No	Link / Portal	Description
1	https://youtu.be/OLXq4nEWr9k?si=qvIVJEZoRTUK6SOG	Plant Layout in Operations Management , Facility Layout, Types of Plant Layout, Principles of Layout
2	https://youtu.be/DrO5sS51Yk8?si=Qcm5BW5P1pqR4GMY	https://youtu.be/DrO5sS51Yk8?si=Qcm5BW5P1pqR4GMY
3	https://youtu.be/4pTtmPSL4-I?si=VP8CTFZ0-mV6rzOh	Emergency Evacuation Plan
4	https://youtu.be/ReL-DM9xhpI?si=cPomSNoXna4TOH -	Fire Emergency and Fire Prevention at your workplace
5	https://youtu.be/q6ymiQO3sPI?si=GXTaLMKqMrNxihJA	Factory to Forecourt - Paint Shop
6	https://youtu.be/TsDsE9fePlk?si=vyR-BSyKfAGZAadf	What is Preventive Maintenance?
7	https://youtu.be/D-j9IH2qDs8?si=56A0AKzFjnu7R0q6	Role of Plant Maintenance in production Management
8	https://youtu.be/F0H9UGdGQ6g?si=A92hOALf2uP1XUPw	Autonomous Maintenance (AM)
9	https://youtu.be/s8IVjQg7yno?si=OIcy_aOqPF1_DzIQ	How do wastewater treatment plants work?
10	https://youtu.be/YW6GBciRHLg?si=Q81DRldR5qDLeoTL	Where Does Your Sewage Go?
11	https://youtu.be/4-SRmmqH2s4?si=36LaAQk1O-KRA6Mh	Water and Waste Water Treatment
12	https://youtu.be/KVvQmf6Phi?si=tYhb0ICjB6FduUr-	Physico chemical processes for wastewater treatment
13	https://youtu.be/BKgzN6K6FJM?si=QPkcXvv4Ff2aWHyJ	Case Study - Common effluent treatment plant
14	https://youtu.be/7jBiYsuw5Es?si=ILMcoJyBHctF_FAT	Reuse and repurpose
15	https://youtu.be/x8ViYoqjEhc?si=x1tmTnK7sHsRzJn-	Introduction to hazardous waste laws and risk assessment
16	https://youtu.be/PbVy-BA9q4Q?si=XwTMA10PviGY2Jn7	Hazardous waste management Sustainable Engineering
17	https://youtu.be/U44RQAzf4NI?si=h53B-jcCSxqznR8A	Introduction to Inventory and Materials Management
18	https://youtu.be/5cg2ceIlGfg?si=bYYezeVtpkwniN-p	Inventory Management- Methods and Strategies
19	https://youtu.be/ZpUD9kkPTiI?si=_firNzIKRisMO3Yk	Inventory Control
20	https://youtu.be/-U7TheYnJ_E?si=bDC4vQamYN1RBA0p	Basic Inventory Model

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

Programme Name/s : Surface Coating Technology
Programme Code : SC
Semester : Third
Course Title : QUALITY MANAGEMENT SYSTEMS FOR PAINT INDUSTRIES
Course Code : 323018

I. RATIONALE

Diploma in Surface Coating Technology has included an important industry oriented course ‘Quality Management Systems for Coating Industries’ in third semester. The course will enable students to learn latest quality management practices which are adopted in surface coating Industries. It also provides opportunities to understand emerging models and global practices of TQM, IS 101, quality tools and its implementation in industries.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences: • Apply emerging models and global practices of TQM, IS 101, quality tools and its implementation in surface coating industries.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Comprehend the concepts of quality control, assurance, TQM and IS 101.
- CO2 - Apply different quality tools to improve quality in totality.
- CO3 - Develop models and practices of total quality management in coating industries.
- CO4 - Adopt quality circle as an approach to improve quality of the process.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme						Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH	Theory			Based on LL & TL				Based on SL						
				CL	TL	LL			Total			Practical		SLA								
												FA-TH	SA-TH	FA-PR	SA-PR	Max	Min					
323018	QUALITY MANAGEMENT SYSTEMS FOR PAINT INDUSTRIES	QMS	DSC	-	-	8	2	10	2	-	-	-	-	-	100	40	50@	20	50	20	200	

Total IKS Hrs for Sem. : Hrs

Abbreviations: CL- Classroom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	TLO 1.1 Define quality, process quality, product quality, customer and user. TLO 1.2 Differentiate quality assurance and quality control. TLO 1.3 Describe requirements of IS 101, NABL and ASTM TLO 1.4 List approaches of quality systems.	Unit - I Fundamentals of Quality 1.1 Definition of quality, process quality, product quality, customer and user 1.2 Concepts of quality-quality control, quality assurance, quality specification, tolerances and deviations. 1.3 Definitions-TQM, TCM, QMS, QC. 1.4 Introduction to Bureau of Indian Standards (BIS), IS 101, NABL and ASTM	Presentation Group discussion
2	TLO 2.1 Explain concept of quality tools. TLO 2.2 Calculate Mean, median, mode and standard deviation from given chart. TLO 2.3 Prepare control plan, control chart, scatter diagram from given data.	Unit - II Quality tools 2.1 Concept of quality tools. 2.2 Product and process specification. Simple statistics for quality-standard deviation, mean, median, mode and variation. 2.3 Random sampling and sampling plan. 2.4 Dynamic control plan-Process flow chart, Process failure mode and effect analysis, Control plan. 2.5 Quality control tools- Histogram, Pareto analysis, Check sheet, Control chart, Scatter diagram and Stratification.	Presentations Group discussion
3	TLO 4.1 Describe total quality, quality management and cost management TLO 4.2 Explain PDCA cycle and ISO 9001:2015. TLO 4.3 List Models and approaches for TQM.	Unit - IV Total Quality Management 4.1 Concept of total quality, quality management and cost management. 4.2 Pillars of TQM, continual improvement, team work and leadership. 4.3 Quality management, PDCA cycle. 4.4 Models and approaches for TQM-QC, kaizen, 5S, JIT, six sigma.	Presentations Assignment Lecture- Q&A Group discussion
4	TLO 5.1 Explain models of quality management TLO 5.2 Describe requirements of documents ISO 9001 TLO 5.3 Describe functioning of QC TLO 5.4 Explain problem-solving techniques.	Unit - V Quality system implementation 5.1 Methods, models and techniques of quality systems implantation in surface coating industries 5.2 ISO 9001:2015 documentation-Quality manual, policy, departmental procedures, formats, work instructions 5.3 Quality circle in surface coating industries-formation and functioning. 5.4 Rational problem solving-Cause and solutions	Presentations Lecture- Q&A Assignment Group discussion

VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Compare physical properties of given paint material by varying test parameters.	1	*Technical specification and measurement of tolerances of paint property and test equipment.	8	CO1
LLO 2.1 Compare dry film properties of given coated film and tolerance level.	2	Experimental set up for dry film properties with quality specification.	8	CO1

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 3.1 Prepare list of documents as per NABL norms for given process of surface coating.	3	Documentation for NABL accreditation for surface coating industries.	8	CO1
LLO 4.1 Derive a standard deviation, mean, median, mode, variation from derived data.	4	Calculation of statistical parameters like standard deviation, mean, median, mode, variation of derived data	8	CO1
LLO 5.1 Prepare dynamic control plan for given surface coating process.	5	*Dynamic control plan for surface coating process.	8	CO2
LLO 6.1 Apply Pareto chart and histogram to find most important cause/s from derived data. LLO 6.2 Apply Pareto chart and histogram to find most important causes from derived data.	6	*Calculation and criteria for Pareto chart and histogram.	8	CO2
LLO 7.1 Determine parameters for continual improvement for given surface coating processes.	7	Process identification and parameters for continual improvement.	8	CO3
LLO 8.1 Apply PDCA cycle for identified set of problems.	8	*Plan, Do, Check, Act cycle methodology for quality improvement.	8	CO3
LLO 9.1 Prepare a standard operating process for given surface coating process	9	Standard operating process for given surface coating process with technical specifications, anomalies, safety precaution etc.	8	CO4
LLO 10.1 Conduct an internal audit for laboratories.	10	*Internal audit for laboratories as per ISO.	8	CO4

Note : Out of above suggestive LLOs -

- *Marked Practicals (LLOs) Are mandatory.
- Minimum 80% of above list of lab experiment are to be performed.
- Judicial mix of LLOs are to be performed to achieve desired outcomes.

VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)

Micro project

- Micro project- I: Prepare a report on quality improvement methods in industries. a. Search quality improvement methods / practices /procedure in the industry/ field. b. Write details procedure and quality tools used. c. Explain details of quality tools used. d. Prepare report (10-15 pages) with enclosures of photograph and references.
- Micro project- II: Prepare a documentation for IS 101. a. Identify 10-15 Search powder coating methods / practices /procedure in the industry/ field. b. Write details procedure of method with flow diagram and control plan. c. Describe various equipment and raw materials, d. Prepare report (10-15 pages) with enclosures of photograph and references.
- Micro project- III: Apply ABC analysis, Pareto char analyses and FSN analysis a. Collect data and information of various process/inventory. b. Derive a criteria for cut-off points c. Analyze data and information and plot ABC, Pareto and FSN chart. d. Prepare report (10-15 pages) with enclosures of photograph and references.

Assignment

- Assignment- I: Case study on QMS a. Write a case study of any one QMS-TQM-QC, kaizen, 5S, JIT, six sigma practiced in surface Coating industries. b. Prepare report/Case (10-15 pages) with enclosures of photograph and references.

Term work

- Prepare a Journal consisting: a. List of laboratory experiences performed for Quality Management Systems for Coating Industries. b. For each practical, perform write (Scope, chemicals, instruments, process, observations, diagram, calculations etc.) c. Arrange chronologically. d. Prepare report for submission.

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Flow cup (B-4)	1
2	Stop watch	1
3	Thermometer (0-110OC)	1
4	Oven (300OC)	1,2
5	Petri dish (3X3 cm)	1,2
6	Weighing balance (up to 500gms)	1,7,8
7	Wt/lit cup (100ml)	1,9
8	Wt/lit cup (50ml)	1,9
9	Ferrous DFT meter	2
10	MS panel (7*15cm)	2,8
11	Non-Ferrous DFT meter	2,9
12	Muffle Furnace (800OC)	8
13	Spatula	All

IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Fundamentals of Quality	CO1	0	0	0	0	0
2	II	Quality tools	CO2	0	0	0	0	0
3	IV	Total Quality Management	CO3	0	0	0	0	0
4	V	Quality system implementation	CO4	0	0	0	0	0
Grand Total				0	0	0	0	0

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Assignment, Self-learning and Term work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End of Term Examination
- Viva-voce
- Lab. performance

XI. SUGGESTED COS - POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	2	1	-	-	1	2	2			
CO2	2	2	2	2	1	2	2			
CO3	2	2	1	1	1	2	2			
CO4	2	2	2	2	1	2	2			

Legends :- High:03, Medium:02,Low:01, No Mapping: -
 *PSOs are to be formulated at institute level

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	Besterfield D.H. et al.,	Total Quality Management (3rd Edition)	Pearson Education Asia, 2006 ISBN: 978-9353066314
2	Janakiraman B. and Gopal R.K	Total Quality Management	Prentice Hall India Learning Private Limited, 2006 ISBN: 978-8120329959
3	Amitva Mitra	Fundamentals of Quality Control and Improvement (3rd Edition)	Wiley; ISBN: 978-8126544097
4	ISO Standard	ISO 9001:2015 (Clause wise requirements) 4th Sept. 2015	ISO Standard
5	Manish Kumar Shukla	Quality Control Tools(7qc Tools)	Independently Published; ISBN: 979-8649992312
6	Jennifer Bowen, Jason Bennett	Six SIGMA: Step-By-Step Guide to Six SIGMA (Six SIGMA Tools, Dmaic, Value Stream Mapping, Launching a Project and Implementing Six Sigma)	Createspace Independent Publishing Platform; ISBN: 978-1724653147
7	AIAG	Production Part Approval Process (PPAP) (4th Edition)	AIAG; ISBN: 9781605340937
8	VIVEK A. SHROUTY	ISO 9001:2015	Zorba Books; ISBN: 9789390640362
9	Ray Tricker	Quality Management Systems: A Practical Guide to Standards Implementation	Routledge; ISBN: 9780367223533
10	B. Purushothama	Effective Implementation of Quality Management Systems	Woodhead; ISBN: 9789380308036

XIII. LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://youtu.be/oMYqqAbsEXo?si=j9WEJdBzBiM03WhW	Fundamentals of Total Quality Management
2	https://youtu.be/dFTDtRe08kg?si=x9UfMe0cIU5p38Y8&t=16	Bureau of Indian Standards (BIS) - Organization
3	https://youtu.be/b6NxJnkhqwk?si=kaiTPgk0YUjLRxAm	7 Quality Control Tools

Sr.No	Link / Portal	Description
4	https://youtu.be/ZPpizjY90t0?si=GQ3lIAAR5I5VTc_u	Acceptance Sampling plan
5	https://youtu.be/jYcH_K3U_Go?si=8rApocmNMokuQY-h	Process Failure Modes and Effects Analysis and Control Plan
6	https://youtu.be/dLEk6SVU2gg?si=cX9I0z8BINhxVOA9	How to Create 'Pareto Chart' in Excel
7	https://youtu.be/gomyUdHfi1U?si=Aep-wG7aPiLjeYLj	what Is Instrument Calibration. Instrument Calibrator. RTD Calibration. Calibration certificates
8	https://youtu.be/bgAW7LCyWiw?si=5kaN-eIsiAm3qgBO	The quality of the panels for paint testing in our laboratory
9	https://youtu.be/renlXcpK9sk?si=MEKrdNPmNVcKznGe	What is Total Quality management (TQM)
10	https://youtu.be/M2aKbUwiHSo?si=oTIif6MXI75cqXak	TQM Pillars
11	https://youtu.be/Em0hZit4M_Y?si=48reMWLTbrcT77Iz	KAIZEN, kaizen technique, kaizen in quality management, kaizen
12	https://youtu.be/Rlw8dYdCEok?si=1912FH5z5umHdnI6	PDCA Cycle
13	https://youtu.be/w1xzLXOFSfU?si=7asqCox5quvpiRuK	Just In Time (JIT) Production
14	https://youtu.be/1oiKYydbRsw?si=WaMQw6RVc9vmMkeU	What is Six Sigma ?
15	https://youtu.be/LdEmmrTkhfg?si=epJnsz4zca5Zi8f6	ISO 9001 2015 Mandatory Document List
16	https://youtu.be/TzthH9jTeMU?si=aEw6MDtHDPb0ufjY	Quality Circle
17	https://youtu.be/V2EMuoM5IX4?si=RqjaoMqnvLWGjvSv	The psychology behind irrational decisions of problem solving

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

Programme Name/s : Hotel Management & Catering Technology/ Surface Coating Technology
Programme Code : HM/ SC
Semester : Third
Course Title : INTERNSHIP (16 WEEKS)
Course Code : 323019

I. RATIONALE

Globalization has prompted organizations to encourage skilled and innovative workforce. Internships are educational and career development opportunities, providing practical/ hands on experience in a field or discipline. Summer internship is an opportunity for students to get accustomed to modern industry practices, apply the knowledge and skills they have acquired in the classroom to real-world situations and become familiar with industry environment before they enter the professional world. Keeping this in mind, industrial training is incorporated to all diploma programmes as it enables the student to get equipped with practical skills, soft skills and life skills

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences: • Apply skills and practices to industrial processes.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Observe time/resource management and industrial safety aspects.
- CO2 - Acquire professional experience of industry environment .
- CO3 - Establish effective communication in working environment
- CO4 - Prepare report of assigned activities and accomplishments.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme						Credits	Paper Duration	Assessment Scheme									
				Actual Contact Hrs./Week			SLH	NLH	Theory			Based on LL & TL				Based on SL		Total Marks			
				CL	TL	LL						Practical				SLA					
							FA-TH	SA-TH				Total		FA-PR			SA-PR				
Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min										
323019	INTERNSHIP (16 WEEKS)	IN16	DSC	-	-	-	-	36 - 40	16	-	-	-	-	-	100	40	100#	40	-	-	200

*Credits for Industrial Training are in-line of guidelines of NCrF :

\$\$ The industrial Training is of 16 weeks considering 36-40 hours per week engagement of students (as per Guidelines of GR of Maharashtra Govt.) with guidance of industry supervisor/Mentor.

NOTE :- For Programme offering this course during the ODD semester, Industrial training duration will be of 16 weeks which will be accomplished by 6 weeks from summer vacation and 10 weeks from semester. For remaining 6 weeks from semester, students will be physically attending the Institute to learn theory-practical courses.

V.General guidelines for organizing Industrial training

The Industry/organization selected for Industrial training/ internships shall be Government/Public Limited/ Private limited / Startup /Centre of Excellence/Skill Centers/Skill Parks etc.

- a) Duration of Training - 16 weeks students engagement time
- b) Period of Time slot - 3 rd /4 th /5 th /6 th semester (16 weeks) As per Respective Programme Scheme

- c) Industry area - Engineering Programme Allied industries of large, medium or small-scale, Organization/Govt./ Semi Govt Sectors

VI. Role(s) of Department at the Institute:

Following activities are expected to be performed by the concerned department at the Polytechnics.

S.No	Activity	Suggested Schedule WEEKS
1.	Collecting information about industry available and ready for extending training with its offered capacity of students (Sample Format 1)	First to third week of previous Semester
2.	Allocations of Student and Mentor as per availability (Mentor: Student Ratio (1:15))	Fourth to Six week of previous Semester
3.	Communication with Industry and obtaining its confirmation Sample letter Format	Sixth to Eight week of previous Semester
4.	Securing consent letter from parents/guardians of students (Sample Format 2)	Before Tenth week of previous Semester
5.	Enrollment of Students for industrial training (Format 3)	Before 14 th week of previous Semester
6.	Issue of letter to industry for training along with details of students and mentor (Format 4)	Before end of previous Semester
7.	Organize Internship Orientation session for students Sample assessment check list	Before end of respective Semester
8.	Progressive assessment of industry training by Mentor	Each week during training period
9.	Assessment of training by institutional mentor and Industry mentor	Respective Semester ESE

Suggestions-

- a. Department can take help of alumina or parents of students having contact in different industries for securing placement.
- b. Students would normally be placed as per their choices, in case of more demand for a particular industry, students would be allocated considering their potentials. However preference for placement would be given to students who have arranged placement in company with the help of their parents or relatives.
- c. Principal/HOD/Faculty should address students about industrial safety norms, rules and discipline to be maintained in the industry during training before relieving students for training.
- d. The faculty members during the visit to industry or sometimes through online mode will check the progress of the student in the training, student attendance, discipline, and project report preparation.

VII. Roles and Responsibilities of students:

- a. Students may interact with the mentor to suggest choices for suitable industry, if any. In case of students have any contact in industry through their parents or relatives then same may be utilized for securing placement for themselves and their peers.
- b. Students have to fill the forms/formats duly signed by institutional authorities along with training letter and submit it to training officer/mentor in the industry on the first day of training.
- c. Students must carry with him/her Identity card issued by the institute during training period.
- d. Students should follow industrial dressing protocols, if any. In absence of specific protocol student must wear college uniform compulsorily.
- e. Students will have to get all necessary information from the training officer/mentor at industry regarding schedule of training, rules and regulation of the industry and safety norms to be followed. Students are expected to observe these rules, regulations and procedures.
- f. Students must be fully aware that if they disobey any rule of industry or do not follow the discipline then non-disciplinary action will be taken .
- g. Students must Maintain weekly diary (Format 6) by noting daily activities undertaken and get it duly signed from industry mentor or Industrial training in charge.

- h. In case students faces any major problems in industry such as an accident or any disciplinary issue then they should immediately report the same to the mentor at the institute.
- i. Prepare final report about the training for submitting to the department at the time of presentation and viva-voce and get it signed from mentor as well as industry training in charge.
- j. Student must submit the undertaking as provided in Format 5.

VIII. Typographical guidelines for Industry Training report

Following is the suggestive format for preparing the training report. Actual report may differ slightly depending upon the nature of industry. The training report may contain the following

- a. The training report shall be computer typed (English- British) and printed on A4 size paper.
- b. Text Font -Times New Roman (TNR), Size-12 point
- c. Subsection heading TNR- 12 point bold normal
- d. Section heading TNR- 12 capital bold
- e. Chapter Name/ Topic Name – TNR- 14 Capital
- f. All text should be justified. (Settings in the Paragraph)
- g. The report must be typed on one side only with double space with a margin 3.5 cm on the left, 2.5 cm on the top, and 1.25 cm on the right and at bottom.
- h. The training report must be hardbound/ Spiralbound with cover page in black colour. The name of the candidate, diploma (department), year of submission, name of the institute shall be printed on the cover [Refer sample sheet (outer cover)]
- i. The training report, the title page [Refer sample sheet (inner cover)] should be given first then the Certificate followed by the acknowledgment and then contents with page numbers.

IX. Suggestive format of industrial training report

Following format may be used for training report. Actual format may differ slightly depending upon the nature of Industry/ Organization.

1. Title Page
2. Certificate
3. Abstract
4. Acknowledgement
5. Content Page

- | | |
|------------|---|
| Chapter 1 | Organization structure of Industry and general layout. |
| Chapter 2 | Introduction to Industry / Organization (history, type of products and services, turn over and number of employees etc.) |
| Chapter 3 | Types of Major Equipments/raw materials/ instruments/machines/ hardware/software used in industry with their specifications, approximate cost, specific use and routine maintenance done. |
| Chapter 4 | Processes/ Manufacturing techniques and methodologies and material handling procedures. |
| Chapter 5 | Testing of Hardware/Software/ Raw materials/ Major material handling product (lifts, cranes, slings, pulleys, jacks, conveyor belts etc.) and material handling procedures. |
| Chapter 6 | Safety procedures followed and safety gears used by industry. |
| Chapter 7 | Particulars of Practical Experiences in Industry/Organization if any in Production/Assembly/Testing/Maintenance. |
| Chapter 8 | Detailed report of the tasks undertaken (during the training). |
| Chapter 9 | Special/challenging experiences encountered during training if any (may include students liking & disliking of work places). |
| Chapter 10 | Conclusion. |

Chapter 11 References / sources of information.

X. Suggested learning strategies during training at Industry

- o Students should visit the website of the industry where they are undergoing training to collect information about products, processes, capacity, number of employees, turnover etc.
- o They should also refer the handbook of the major machines and operations, testing, quality control and testing manuals.
- o Students may also visit websites related to other industries wherein similar products are being manufactured.

XI. Tentative week wise schedule of Industry Training

Industrial training is a common course to all Diploma programmes , therefore the industry selection will depend upon the nature of programme and its related industry. The training activity may vary according to nature and size of industry.

The following table details suggestive schedule of industrial training for all programmes offering 16 weeks of internships.

Week No	Details of Activities to be completed during Industry	FA Marks distribution for weekly dairy
1	Introduction of Industry and departments.	5
2	Study of Layout of Industry, Specifications of Machines , raw materials, components available in the industry.	5
3	Study of setup and manufacturing processes.	5
4 to 14	Execute given project or work assigned to the students ,study of safety and maintenance procedures.	20
15	Validation from industry mentor regarding project or work allocated.	25
16	Report writing.	15
Total FA Marks		100

XII. CO-PO Mapping

Table to be created by respective faculty for each project

XIII. Formative Assessment of training

A. Suggested RUBRIC of component FA

Week No	Task to be assessed	Outcome Achievement - Poor	Outcome Achievement - Moderate	Outcome Achievement -High		Week-wise Total Marks
		Poor Marks	Average Marks	Good Marks	Excellent Marks	
1	Introduction of Industry	Minimal Knowledge of Departments, processes, products and work culture of the company (Marks –1-4)	Moderate Knowledge of Departments, processes, products and work culture of the company (Marks –5-9)	Good Knowledge of Departments, processes, products and work culture of the company (Marks –10-12)	Extensive Knowledge of Departments, processes, products and work culture of the company (Marks –13-15)	

Week No	Task to be assessed	Outcome Achievement - Poor	Outcome Achievement - Moderate	Outcome Achievement -High		Week-wise Total Marks
		Poor Marks	Average Marks	Good Marks	Excellent Marks	
2	Presentation of Layout of Industry, Specifications of Machines, raw materials, components available in the industry	Minimal w.r.t. tasks (Marks –1-4)	Moderate w.r.t. tasks (Marks –5-9)	Good w.r.t. tasks (Marks –10-12)	Extensive w.r.t. tasks (Marks –13-15)	
3	Participation in setup and manufacturing processes	Minimal Participation with poor understanding (Marks –2)	Moderate Participation with poor understanding (Marks –3-4)	Good Participation with poor understanding (Marks –5-8)	Extensive Participation with poor understanding (Marks –9-10)	
4 to 14	Execution of given project or work to the students, Follow of safety and maintenance procedures	Minimal Participation with poor understanding (Marks –5-10)	Moderate Participation with lower level understanding (Marks – 10-14)	Good Participation with Good understanding (Marks – 15-17)	Extensive Participation with excellent understanding (Marks – 18-20)	
15	Validation from industry mentor regarding project or work allocated	Minimal Participation with poor performance (Marks – 8-10)	Moderate Participation with acceptable performance (Marks – 11-15)	Good Participation with good performance (Marks – 16-20)	Extensive Participation with excellent performance (Marks – 20-25)	
16	Diary writing	<ul style="list-style-type: none"> Results are not Presented properly, Project work is summarized and concluded not acceptable Future extensions are not specified (Marks –1-4)	<ul style="list-style-type: none"> Results are Presented just casually Project work is summarized and concluded casually Future extensions are casually specified (Marks –5-9)	<ul style="list-style-type: none"> Results are Presented well and properly, Project work is summarized and concluded to a Good level Future extensions are well specified (Marks –10-12)	<ul style="list-style-type: none"> Results are Presented exhaustively Project work is summarized and elaborated in excellent manner , concluded Future extensions are excellently specified (Marks – 13-15)	
Total Out of :100						

B. FA Marks are to be maintained in following table

Name of the industry:

Sr No.	Enrolment Number	Name of student	Marks from FA Table						Total 100
			Week 1	Week 2	Week 3	Week 4 to 14	Week 15	Week 16	

Marks for (FA) are to be awarded for each week considering the level of completeness of activity observed as per table specified in Sr.No. XIII above, from the daily diary maintained . Feedback from industry supervisor shall also be considered.

Name of mentor:

Signature of Mentor

I. Suggested RUBRIC for SA

Enrollment Number	Observations from Orals				Presentations				Total (100)
	Tasks undertaken (Marks-10)	Overall Understanding (Marks-20)	Creativity /Innovation demonstrated (Marks-5)	Knowledge acquired (Marks-10)	Speech Clarity (Marks-5)	Body Language (Marks-5)	Presentations (Marks-20)	Diary , Report writing and / Product (Marks-25)	

Format-1

Collecting Information about Industry/Organization available for training along with capacity

- 1) Name of the industry/organization:
- 2) Address/communication details with email :
- 3) Contact person details:
 - a) Name:
 - b) Designation:
 - c) Email
 - d) Contact number/s:
- 4) Type: Govt / PSU / Pvt / Large scale / Medium scale / Small scale
- 5) Products/services offered by industry:
- 6)
 - a) Whether willing to offer Industrial training facility during May/ June for Diploma in Engineering students: Yes / No.
 - b) If yes, whether you offer 16 weeks training: Yes/No
 - c) Industrial capacity to offer -possible:

Students	Programme name/ Title				Total
	Civil	Mechanical	Chemical		
Male					
Female					
Total					

- 7) Whether accommodation available for interns Yes / No.
If yes capacity: _____
- 8) Whether internship is charged or free:
If charged please specify amount per candidate: _____

Signature of responsible person at Industry:

Format-2

**Consent Letter from parents/guardians
(Undertaking from Parents)**

To,
The Principal,

Subject: Consent for Industrial Training.

Sir/Madam,

I am fully aware that -

i) My ward studying in _____ semester at your _____ institute has to undergo 16 weeks of Industrial training for partial fulfillment towards completion of Diploma in _____ Engineering.

ii) For this fulfillment he/she has been deputed at _____ industry, located at _____ for Industrial training /internship for the period from _____ to _____

With respect to above I give my full consent for my ward to travel to and from the mentioned industry. Further I undertake that –

- a) My ward will undergo the training at his/her own cost and risk during training and/or stay.
- b) My ward will be entirely under the discipline of the organization where he/she will be placed and will abide by the rules and regulations in face of the said organization.
- c) My ward is NOT entitled to any leave during training period.
- d) My ward will submit regularly a prescribed weekly diary, duly filled and countersigned by the training supervisor of the organization to the mentor faculty of the polytechnic.

I have explained the contents of the letter to my ward, who has also promised to adhere strictly to the requirements. I assure that my ward will be properly instructed to take his own care to avoid any accidents/injuries in the industry. In case of any accident neither industry nor the institute will be held responsible.

Signature of Parent/Guardian :

Name : _____

Address : _____

Phone Number: _____

Date: _____

Name and Signature of the student:

Phone Number of students:

Format-3

**Students Enrollment for Industrial Training
(Year – 20)**

Sr No	Enrollment Number	Name of Student	Name of Industry	Name of Mentor at Institute

Format-4

Letter to the Industry/Organization for the training along with details of students and mentors

To,
The HR Manager,

Subject: Placement for Industrial training of ___ weeks in your organization....

Reference: Your consent letter no:

Sir,
With reference to the above we are honored to place the following students from this institute for Industrial training in your esteemed organization as per the arrangement arrived at.

Diploma programme in _____ Engg.

Sr.No	Enrollment Number	Name of Student	Name and designation of Mentor

Diploma programme in _____ Engg.

Sr.No	Enrollment Number	Name of Student	Name and designation of Mentor

Kindly extend all possible cooperation to the students for above.
Thanking you

Yours sincerely,
(Principal)
Name of the Institute:
with Seal

Cc- To HoD/Mentor

Format-5

Undertaking by the students

TO
Principal

Subject: Undertaking regarding Placement for Industrial training of 12/16/18 weeks duration

IReg No:..... S/o/D/o.
.....Studying in ----- at -----
--Institute at -----fully aware of the Industrial Training requirement and related responsibilities
and participation in the, Industrial training between From:
To.....

I assure you that I will be of good behavior and be obedient to the staff and mentor during
the...../Industrial training. I will also abide and will not participate in all activity. I will also
discipline myself within the rules and regulations of the Institution. I am also aware that I am participating in the
..... at my own risk and I will not hold the -----Institute responsible in any way in any
eventuality namely Accident /Injury/death or whatever mishap and I myself will be solely responsible for my
safety.

Place :
Date :

Signature of the student
Reg. No.

Format-6

Internships Daily Diary

Name of the Student: _____ **Name of the mentor (Faculty) :**

Enrollment Number: _____ **Semester:** _____ **Academic Year**

Week	Day & Date	Discussion Topics/Activity	Details of Work Allotted Till Next Session /Corrections Suggested/Faculty Remarks	Signature of Industry Mentor
Week 01	Mon, Date			
	Tue, Date			
	Wed, Date			
	Thu, Date			
	Fri, Date			
	Sat, Date			
	Mon, Date			
	Tue, Date			
	Wed, Date			
	Thu, Date			
	Fri, Date			
	Sat, Date			
Week n	Mon, Date			
	Tue, Date			
	Wed, Date			
	Thu, Date			
	Fri, Date			
	Sat, Date			