

Syllabus for the trade  
of

# HOSPITAL WASTE MANAGEMENT

(SEMESTER PATTERN)  
UNDER  
CRAFTSMAN TRAINING SCHEME

Designed in: 2013

By

Government. of India  
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE  
Directorate General of Employment & Training  
Ministry of Labour & Employment  
EN 81, SECTOR – V, SALT LAKE CITY,  
Kolkata – 700 091.

**List of members of Trade Committee meeting for the trade of Hospital Waste Management held on 12<sup>th</sup> December'2011 at Central Staff Training & Research Institute (CSTARI), Kolkata.**

<b>Sl. No.</b>	<b>Name &amp; Designation Shri/Smt.</b>	<b>Representing Organisation</b>	<b>Remarks</b>
1.	S.J.Amalan, Director	CSTARI, EN-81, Salt Lake, Kolkata-91	Chairman
2.	Rabin Debnath, Asstt. Director of Industrial Trg.	DTE. Of Indl. Trg., TE&T Dept., Govt. of West Bengal.	Member
3.	Sougata Saha, Director	Comtel Electronics (P) Ltd. Salt Lake, Kolkata.	Member
4.	Pijush Chatterjee, Manager	Hotel Kamala Residency, New Digha. Paschim Midnapore	Member
5.	M.C.Sharma, JDT.	CSTARI, EN-81, Salt Lake, Kolkata-91	Member
6.	Dibyendu Paul, MD & CEO	PTIMA, BE-54, Salt Lake City, Sector-I, Kolkata-700 064	Member
7.	Dr. Ayan Dasgupta, Medical Practitioner	Dunlop, Kolkata-108.	Member
8.	Nisith Ranjan Seal, Director	Soft Tek, AB-19, Deshbandhu Nagar, Kolkata-59.	Member
9.	Dr. Amarendu Mondal, Director	PTIMA, BE-54, Salt Lake City, Sector-I, Kolkata-700 064	Member
10.	Swami Nath Prasad, Director	Dream Merchant Privet Limited, Kolkata.	Member
11.	Kshetra Mohan Ghosh, Instructor	ITI, Howrah Homes, West Bengal.	Member
12.	Muktanand, Trg. Officer	RDAT (ER), Kolkata-64.	Member
13.	Gautam Sardar, Director	National Institute of Hotel Management, Kolkata.	Member
14.	Mrs. Mousami Panigrahi, Manager	SAPTAK Tour & Travels, Kolkata.	Member
15.	Ganesh Sen, Manager	Sunita Tourist & Travels, Andaman & Nicobar Island, Kolkata.	Member
16.	Pranabesh Maity, Officer	Life Insurance corporation of India, Kolkata.	Member
17.	Soma Das (Talukdar)	RVTI (W), Kolkata	member
18.	A.K.Mandal, ADT	ATI, Kolkata	Member
19.	L.K.Mukherjee, DDT	CSTARI, EN-81, Salt Lake, Kolkata-91	Member
20.	S.B.Sardar, ADT	CSTARI, EN-81, Salt Lake, Kolkata-91	Member
21.	Nirmalya Nath, ADT	CSTARI, EN-81, Salt Lake, Kolkata-91	Member
22.	Sipra Das, ADT	CSTARI, EN-81, Salt Lake, Kolkata-91	Member
23.	R.N.Manna, T.O.	CSTARI, EN-81, Salt Lake, Kolkata-91	Member
24.	Hemant Kujur, D/Man	CSTARI, EN-81, Salt Lake, Kolkata-91	Member
25.	Pradip Biswas, D/Man	CSTARI, EN-81, Salt Lake, Kolkata-91	Member

*List of members attended the Workshop to finalize the syllabi of existing CTS into Semester Pattern held from 6<sup>th</sup> to 10<sup>th</sup> May'2013 at CSTARI, Kolkata.*

<b>Sl. No.</b>	<b>Name &amp; Designation</b>	<b>Organisation</b>	<b>Remarks</b>
1.	R.N. Bandyopadhyaya, Director	CSTARI, Kolkata-91	Chairman
2.	K. L. Kuli, Joint Director of Training	CSTARI, Kolkata-91	Member
3.	K. Srinivasa Rao, Joint Director of Training	CSTARI, Kolkata-91	Member
4.	L.K. Mukherjee, Deputy Director of Training	CSTARI, Kolkata-91	Member
5.	Ashoke Rarhi, Deputy Director of Training	ATI-EPI, Dehradun	Member
6.	N. Nath, Assistant Director of Training	CSTARI, Kolkata-91	Member
7.	S. Srinivasu, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
8.	Sharanappa, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
9.	Ramakrishne Gowda, Assistant Director of Training	FTI, Bangalore	Member
10.	Goutam Das Modak, Assistant Director of Trg./Principal	RVTI, Kolkata-91	Member
11.	Venketesh. Ch. , Principal	Govt. ITI, Dollygunj, Andaman & Nicobar Island	Member
12.	A.K. Ghate, Training Officer	ATI, Mumbai	Member
13.	V.B. Zumbre, Training Officer	ATI, Mumbai	Member
14.	P.M. Radhakrishna pillai, Training Officer	CTI, Chennai-32	Member
15.	A.Jayaraman, Training officer	CTI Chennai-32,	Member
16.	S. Bandyopadhyay, Training Officer	ATI, Kanpur	Member
17.	Suriya Kumari .K , Training Officer	RVTI, Kolkata-91	Member
18.	R.K. Bhattacharyya, Training Officer	RVTI, Trivandrum	Member
19.	Vijay Kumar, Training Officer	ATI, Ludhiana	Member
20.	Anil Kumar, Training Officer	ATI, Ludhiana	Member
21.	Sunil M.K. Training Officer	ATI, Kolkata	Member
22.	Devender, Training Officer	ATI, Kolkata	Member
23.	R. N. Manna, Training Officer	CSTARI, Kolkata-91	Member
24.	Mrs. S. Das, Training Officer	CSTARI, Kolkata-91	Member
25.	Jyoti Balwani, Training Officer	RVTI, Kolkata-91	Member
26.	Pragna H. Ravat, Training Officer	RVTI, Kolkata-91	Member
27.	Sarbojit Neogi, Vocational Instructor	RVTI, Kolkata-91	Member
28.	Nilotpal Saha, Vocational Instructor	I.T.I., Berhampore, Murshidabad, (W.B.)	Member
29.	Vijay Kumar, Data Entry Operator	RVTI, Kolkata-91	Member

## GENERAL INFORMATION

1. **Name of the Trade** : Hospital Waste Management
2. **NCO Code No.**
3. **Duration** : 6 Months. ( 1 semester)
4. **Power Norms** : 5 kW
5. **Space Norm** : 2000 Sq ft for one unit
6. **Entry Qualification** : Passed 10<sup>th</sup> class examination
7. **Unit Strength** : 16 Trainees
8. **(A) Instructor's/Trainer's Qualification** : (i) M.Sc Microbiology with one year experience in the relevant field  
(ii) B.Sc Microbiology with 2 years relevant experience  
(iii) NTC/NAC in the trade of Hospital waste Management and 3 years experience in the relevant field or degree with Env. Engg. + One year Experience.
- 8 (B) Desirable qualification** : Preference will be given to a candidate with Craft Instructor Certificate

Note:

- (i) At least one Instructor must have degree /Diploma in the relevant experience
- (ii) Demonstration should be given in a Hospital on common facility site.

SYLLABUS FOR THE TRADE OF HOSPITAL WASTE MANAGEMENT  
UNDER C.T.S

Duration :Six months

FIRST SEMESTER

Smester Code: HWM : SEM I

Week no	Practical	Theory
1-2	Waste survey in a hospital practice on categorization of hospital waste. Awareness of environmental pollution.	Introduction, definition of general and hazardous health care waste and diseases, Infectious waste, genotoxic waste, waste sharps, biomedical waste categories categorization and composition of Biomedical waste .Specification of materials. Color coding. Sources of Health care wastes, Hospitals and health care establishments & other sources. Specifically Communicable diseases, Diseases epidemiology and mode of transmission of disease and prevention. Environmental pollution, its causes, consequences, mitigation and remedies.
3.	'Demonstration on disease epidemiology. By various chart and CD.	Health impacts of biochemical's 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.
4	Vaccination and Prevention of various diseases. Infection control system.	Legislation, policies and law regarding environment on Health care waste management. Biomedical waste management and handling rules, 1998 and its amendment there after.CPCB guidelines. (Central pollution control board)Some idea on safe disposal of Radioactive waste rules,1995 guideline of BARC
5	Pathological, microbiological and radiological waste.	International Scenario world Health Organization guidelines on a)Management of wastes from Hospitals wastes b)Management of Hospital wastes in c) Developing countries
6-7	Practice (on simulated basis) on Segregation. Poly bags collection. Bin. Autoclaving Incineration Labeling Use, care & maintenance of Autoclave, Incinerator	Basic steps in Health Care Waste Management Segregation at the point of generation sharp Decontaminating/Disinfections unit on container for autoclaving Sharp waste containers for storage and transportation autoclaving/ shredding /incrimination /bio hazard symbols. Microwave, Hydropulbing, plasma torch.

	Microwave Hydro pulping plasma torch	
8	Practice on collection & handling of waste(simulated)	Collection & Handling of waste. Infection control system in hospital. Needle sticks injury and other sharp injury and hospital policy for protection of health care workers.
9	Pre-treatment operation	On site Pre-treatment of waste
10	practice on -- Thermal chemical disinfections of(simulated)waste	Mechanical Treatment & Chemical Disinfections store & Off-site transportation
11	Demonstration /practice	Treatment-in-site & off-site(common treatment faculties)Liquid waste treatment Different technologies, cost aspect
12-13	Practice on digging vats, Pits, trenches.	Conventional Treatment Technologies a)Wet thermal technology b) Incineration-different models Alternative Treatment Technologies Microwave Technology Rotaclave system, Hydroclave system Electro Thermal Reactivation(ETP), Treatment Process Electron beam Technology, Plasma Pyrolysis/Gasification systems
14-15	Demonstrations/Practice on a) Composting b) Vermi composting.	Treatment of General/Non-infectious wastes a) Composting Rotating tumbling system French composting b) Vermi-composting
16	Demonstration/practice on disposal	Disposal Technologies a) Sharp disposal pit b) Deep-burial pit c) Secured land fill
17	Demonstration in recycling	Waste Minimization Recycling, Re-use
18-19	Occupational safety/practices	Health & safety Practices Usage of protective equipment Occupational health programmes & safety practices Emergency measures
20	Practice/Demonstration on pretreatment of linen, laundry, central sterilization.	Management of non-clinical support devices pretreatment of linen, laundry, central sterilization unit(CSSD)
22	practice on waste Audit	Estimate of various items of waste management based on no. of wards, no. of beds in each ward, other units like Laboratory, kitchen-waste Audit

23	Estimating various items of waste management Practice in maintenance of records	Hospital budget allocation for hospital waste management Maintenance of records, annual report
24	Visit Ideal waste management sites like waste generation and segregation on site disinfection, Transportation Storage and final disposal.	Visit to hospitals & health care units
25	Revision	
26	Examination	

**TRADE: Hospital Waste Management**  
**LIST OF TOOLS & EQUIPMENT**

**A. TRAINEES TOOL KIT FOR 16 TRAINEES + ONE**

<b>SL.NO.</b>	<b>DESCRIPTION OF TOOLS</b>	<b>QUANTITY</b>
1	Electric tester, wire brush(for cleaning chamber after each cycle)	17 nos.
2	wrench(for opening the chamber),(As require)	17 nos.
3	wire brush(for cleaning chamber after each cycle)	17 nos.
4	Heavy duty gloves	17 nos.
5	Apron	17 nos.
6	Mask	17 nos.
7	Gumboot	17 nos.
8	Syringe and needle cutter	17 nos.

**B. General Shop out fit**

1	Personal computer with latest configuration	01No
2	Fuel High speed Diesel (HSD) -3 Litres per cycle (taking into consideration the power –cut, which completes a new cycle) considering 4 auto clavable bags per cycle ,2 cycles of operation is envisaged per day requiring 11 litres per day or about 4015 litres per year, also a drum or container shall be required for storing the fuel. this is applicable wherever the fuel to run the boiler is HSD (not applicable where operated be electricity )	As per requirment
3	One large size bin (60 liter capacity ) for collecting the treated bags from the autoclave before these are transported to the vat	1 no
4	Water softner –for supply of boiler feed water of required quality for the autoclave about 20-25 ml of softner is required per day .thus 2 cants of 5 litre. capacity would be required in a year.	1 no
5	Jute rag – to be placed under the autoclavable bag in the treatment chamber(5 ft x 4ft in size) each rag can be use for 2 days	2 nos
6	Electric and water supply connection inside autoclave room	01 no



7	Mechanical and Electrical tools such as electric tester, wrench(for opening the chamber), wire brush(for cleaning chamber after each cycle) etc...	2 Each
8	Printer cartridge and paper(3" wide) for the printer of the autoclave. It is envisaged that three printer cartridge and six rolls or papers shall be required in year.	6 rolls
9	Heavy duty gloves, apron, mask, gumboot for safety of the operators	2 each
10	Register for keeping records	16 nos.
11.	Incinerator	1 No.

ii) Syringe and needle cutter, sieved bucket, blue bin and card board box.  
The Basis of requirements of syringe & needle cutters ,blue bin and sieved bucked depends on the number of wards /units where disposable syringe are in use. These shall be installed in the nursing stations within the wards and other units such as a T, Labour room, Emergency pathological Laboratory (where blood is collected to carry out tests), Vaccination Units, Etc and wherever Injections are being administered. The installation of these have to be optimized wherever possible. The requirement of cardboard boxes, shall be similar to the requirement of blue bags . Based on this principle, the consolidated annual / half yearly / quarterly requirements of all these above items may be prepared inclusive of 10 % buffer stock.

iii) Trolleys for internal Segregated Transportation

Internal Transportation of waste from the wards and other units to the temporary storage area / on –site disposal area is to be carried in dedicated trolleys, The General waste shall be transported in black coloured trolleys and the bio- medical waste in red coloured covered trolleys marked with bio-hazard symbol While procuring the trolleys, it should be kept in mind that the trolleys should have the following features. Easy to load and unload, Easy to clean / disinfect. No sharp edges for preventing damage /tearing of waste bags

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