

**MAHARASHTRA STATE BOARD OF SKILL DEVELOPMENT EXAMINATION, MUMBAI**

1	Name of Course	Certified in Tunneling Safety								
2	Course Code	( 411219 )								
3	Max. No. of Students Per Batch	25 Students								
4	Duration		6 Months (fresher) 150hrs	3 months (fast –track for working professional) 100 hrs						
5	Type		Part time	Part-time						
6	No. Of Days / Week		Classroom/ Online / Blended learning	Daily evening lectures Online Blended learning						
7	No. Of Hours /Days		10 hrs –Sat - Sun	3 hrs /day 4 days/week- Online Live faculty 7 hrs – Sunday/ Classroom						
8	Space Required	Theory = 200 sq feet Practical = as per requirement								
9	Minimum Entry Qualification									
10	Objective Of Course	Tunneling has become a common practice in various infrastructure projects and safety in tunnelling is an important objective. There is not comprehensive focused course on this subject has this is being put together to promote safety while tunneling								
11	Employment Opportunity	<b>Employment opportunity:</b> - Tunneling has become a core activity with metro railway projects coming all over the country. Further with ecological sensitivity and climate change has made many projects mandatory to use tunnelling a way to continue development without disturbing the environment  There is a huge need for qualified safety officers in Infrastructure companies and also for re-skilling existing safety officers in tunnelling expertise as Safety is a vast area								
12	Teacher’s Qualification	Degree /Diploma in Civil/ mechanical Engineering with Diploma/ADIS in Safety and minimum 5-8 Years’ Experience as Industrial Safety Officer in Construction/ Project/ Infrastructure sector								
13	Training System	<b>Training System Per Week (average)</b> <table><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>10 hrs</td><td>10 hrs</td><td>20 hrs</td></tr></table>			Theory	Practical	Total	10 hrs	10 hrs	20 hrs
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10 hrs	10 hrs	20 hrs								
14	Internship	Industry - Construction, Infrastructure etc								
15	OJT /Hands on Training (Industry)	Industry - Construction, Infrastructure et								
16	Implant Training	Industry - Construction, Infrastructure et								
17	Projects	On selected subject								
18	Seminars	Attend webinar, Exhibition								

19	Exam. System	<table><tr><th>Sr. No.</th><th>Paper Code</th><th>Name of Subject</th><th>TH/PR</th><th>Hours</th><th>Max. Marks</th><th>Min. Marks</th></tr><tr><td colspan="7">First Year</td></tr><tr><td>1</td><td></td><td>Tunnelling Safety- Paper I</td><td>TH-1</td><td>3hrs.</td><td>100</td><td>50</td></tr><tr><td>2</td><td></td><td>Tunnelling Safety - Paper I</td><td>TH-2</td><td>3hrs.</td><td>100</td><td>50</td></tr><tr><td>3</td><td></td><td>Assessment – I/Project</td><td>Grade</td><td></td><td>A</td><td>D</td></tr><tr><td></td><td></td><td>Total</td><td></td><td></td><td>200</td><td>100</td></tr></table>	Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks	First Year							1		Tunnelling Safety- Paper I	TH-1	3hrs.	100	50	2		Tunnelling Safety - Paper I	TH-2	3hrs.	100	50	3		Assessment – I/Project	Grade		A	D			Total			200	100
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20	Soft Skill Covered	Spoken English/Interview Training/Grooming/Presentation skill/ Audit skills/ report writing skills																																										
21	Question Bank	<ul style="list-style-type: none"><li>• Objective type (Topic wise)</li><li>• Subjective</li><li>• Practical</li></ul>																																										
22	Lesson Plan	<ul style="list-style-type: none"><li>• Monthly</li><li>• Weekly</li></ul>																																										
23	Demo Plan (Skills covered)	<ul style="list-style-type: none"><li>• Monthly</li><li>• Weekly</li></ul>																																										
24	Occupation Map (Scope for Employment)	Safety requirement in Construction / Infrastructure Industry																																										
25	List of Machinery/Equipment/Tool	N.A																																										
26	Reference Books/ Website/ On line resources	<p>For OHS &amp; MS – ISO 45001 applies</p> <ul style="list-style-type: none"><li>- <a href="https://www.researchgate.net/publication/237090365_The_Handbook_of_Tunnel_Fire_Safety/link/57594e3708aed884620ac555/download">https://www.researchgate.net/publication/237090365_The_Handbook_of_Tunnel_Fire_Safety/link/57594e3708aed884620ac555/download</a></li><li>- Charters, D. Fire risk assessment of rail tunnels. Proceedings of the 1st International Conference on Safety in Road and Rail Tunnels, Basel, 23–25 November 1992; published by University of Dundee</li><li>- <b>BS 6164:2019</b> Health and safety in tunnelling in the construction industry. Code of practice</li></ul>																																										

#### Assessment methodology

1. Continuous assessment using workbooks
2. MCQ based assessment at topic level
3. Descriptive test
4. Project work based on Site visit/implant/internship/site project/process
5. Test paper is based on 50% theory and 50% practical case-studies

## **Syllabus**

- Tunnels & their Classification
- Selection of tunnel alignment
- Investigations for Tunneling
- Excavation for Tunnels
- Shape of Tunnels
- Tunneling in Soft Soils & Hard Rocks
- Tunnels - An underground passage for à Road or rail traffic à Pedestrians à Utilities à Fresh water or sewer. Ratio of length to width.
- Types of Tunnels
- Safety in Tunneling, PPE
- HIRA and JSA
- Equipment & material handling while Tunneling
- Electrical safety, WAH, Confined space , Hot works , WPS etc while Tunneling
- Dealing with Emergencies and First Aid in Tunneling
- Safety reporting and review
- Training and Certifications
- Legal Aspects