Web MTech Qualification Entrance Test Syllabus

Test Time and Pattern:

The test will be objective type covering topics from the syllabus given below. The study materials are also given in the links shown. The test will be for 3 hours, computer-based. Other modalities will be based on the MoU and in association with the parent company.

Syllabus and study materials

Selected topics from (1) Strength of Materials, (2) Fluid Mechanics, (3) Thermodynamics and (4) Mathematics. Books and study materials are suggested below. Visit https://nptel.ac.in/courses/ for lectures in these topics.

(1)*Strength of Materials* :

1. Axial Deformation
2. Stresses
3. Torsion
4. Bending
5. Deflection of Beams
6. Shear

for example, https://nptel.ac.in/courses/112/106/112106141/

Books : 1. Mechanics of Materials by R. C. Hibbeler, Pearson Education
2. Engineering Mechanics of Solids by Egor P. Popov, Prentice-Hall of India
3. Introduction to the Mechanics of Solids by Crandall, Dahl and Lardner, McGraw-Hill

(2)*Fluid Mechanics*:

1. Introduction and Fundamental Concepts
2. Fluid Statics
3. Kinematics of Fluid
4. Conservation Equations and Analysis of Finite Control Volume
5. Equations of Motion and Mechanical Energy
6. Principles of Physical Similarity and Dimensional Analysis
7. Flow of Ideal Fluids
8. Viscous Incompressible Flows

For example,
https://nptel.ac.in/courses/112/104/112104118/#

Books: 1. F M White and H Xue, Fluid Mechanics, 9th Ed, McGraw Hill, 2022
2. Y A Cengel and J M Cimbala, Fluid Mechanics, 4th Ed, McGraw Hill, 2006
3. Munson et al., Fluid Mechanics, 7Th Ed, Wiley, 2016

(3)Thermodynamics:

NPTEL course on "Basic Thermodynamics:

1. Zeroth law, 1st, 2nd and 3rd laws of thermodynamics.
2. Thermodynamics property relations
3. Joule-Kelvin Expansion
4. Gas power cycles
5. Thermodynamics of reacting system
6. Thermodynamics of multi-componet system.

For example,

https://nptel.ac.in/courses/112/105/112105123/

All lectures excluding lectures on vapour cycles. So, lectures 20, 21, 22, and 23 are to be excluded.

Books:

1. Sonntag, R. E, Borgnakke, C. and Van Wylen, G. J., 2003, 6 th Edition, Fundamentals of Thermodynamics, John Wiley and Sons.
2. Jones, J. B. and Duggan, R. E., 1996, Engineering Thermodynamics, Prentice-Hall of India
3. Moran, M. J. and Shapiro, H. N., 1999, Fundamentals of Engineering Thermodynamics, John Wiley and Sons.
4. Nag, P.K, 2018, 6 th Edition, Engineering Thermodynamics, Tata McGraw-Hill Publishing Co Ltd.
5. Venkatesh, A. Basic Engineering Thermodynamics, Universities Press (India) Limited, 2007.

(4) Basic Mathematics:

Preliminaries: Chapter 1 from Thomas' Calculus (11th edition) by George B. Thomas, Maurice D. Weir, Joel Hass, Frank R. Giordano, Addison Wesley, 2004

Derivatives: Chapter 3 & 4 from Thomas' Calculus in SI Unitsm (14th edition) by Joel R. Hass, Christopher E. Heil and Maurice D. Weir, Pearson Global Edition, 2020

Integrals: Chapter 5 & 6 from Thomas' Calculus in SI Unitsm (14th edition) by Joel R. Hass, Christopher E. Heil and Maurice D. Weir, Pearson Global Edition, 2020

Complex Analysis: Chapter 13 from Advanced Engineering Mathematics (9th Edition) by Erwin Kreyszig, Wiley International Edition, 2006

Linear Algebra: Chapter 7 & 8 from Advanced Engineering Mathematics (9th Edition) by Erwin Kreyszig, Wiley International Edition, 2006