

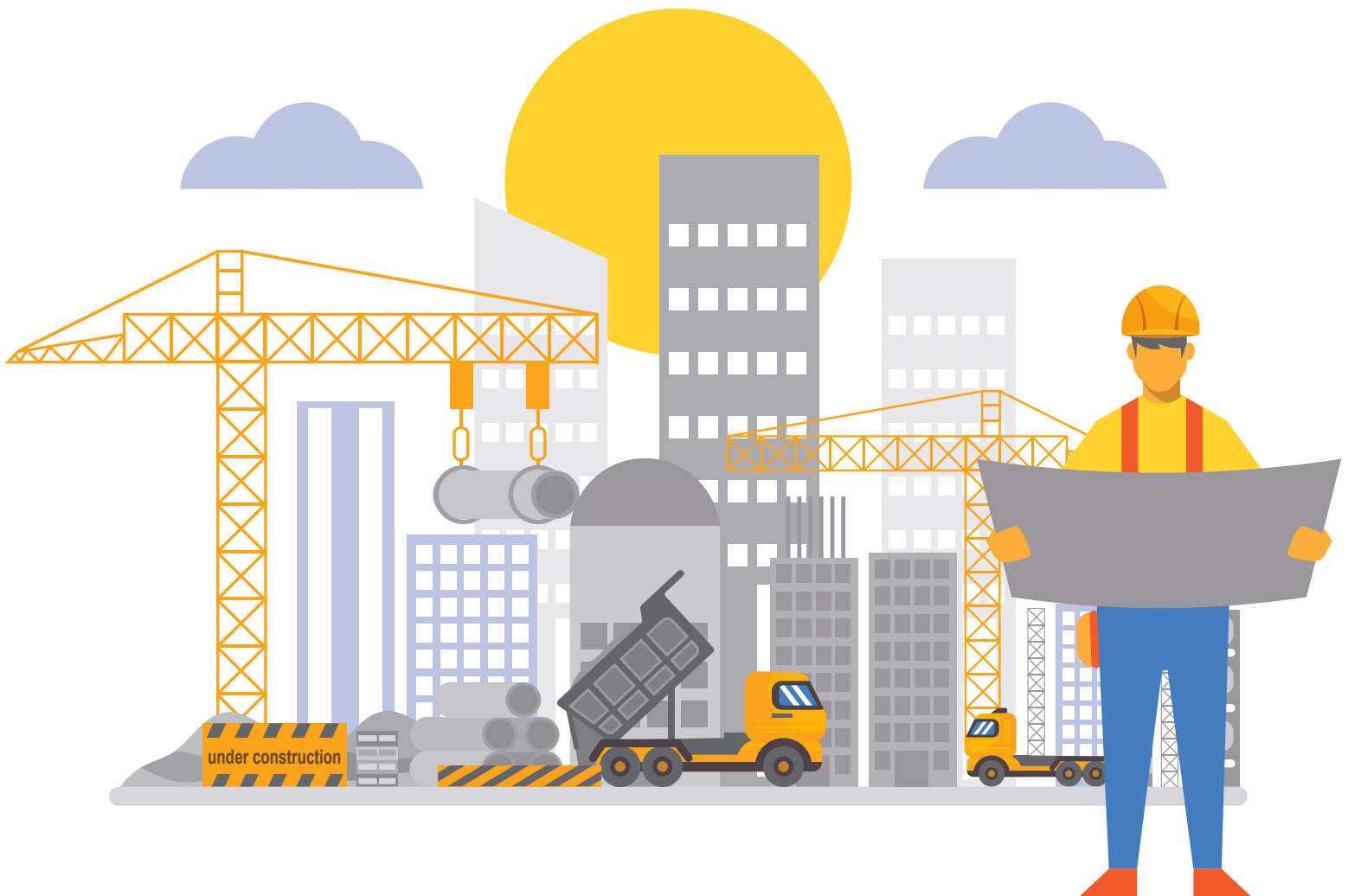
National Curriculum of Pakistan
2022-23

TECHNICAL EDUCATION

CIVIL CONSTRUCTION

Road and Bridge Construction Technology

Grades 11-12



NATIONAL CURRICULUM COUNCIL SECRETARIAT
MINISTRY OF FEDERAL EDUCATION AND
PROFESSIONAL TRAINING, ISLAMABAD
GOVERNMENT OF PAKISTAN

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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It is with great pride that we, at the National Curriculum Council Secretariat, present the first core curriculum in Pakistan's 75-year history. Consistent with the right to education guaranteed by Article 25-A of our Constitution, the National Curriculum of Pakistan (2022-23) aspires to equip every child with the necessary tools required to thrive in and adapt to an ever-evolving globalized world.

The National Curriculum is in line with international benchmarks, yet sensitive to the economic, religious, and social needs of young scholars across Pakistan. As such, the National Curriculum aims to shift classroom instruction from rote learning to concept-based learning.

Concept-based learning permeates all aspects of the National Curriculum, aligning textbooks, teaching, classroom practice, and assessments to ensure compliance with contemplated student learning outcomes. Drawing on a rich tapestry of critical thinking exercises, students will acquire the confidence to embark on a journey of lifelong learning. They will further be able to acknowledge their weaknesses and develop an eagerness to build upon their strengths.

The National Curriculum was developed through a nationwide consultative process involving a wide range of stakeholders, including curriculum experts from the public, private, and non-governmental sectors. Representatives from provincial education departments, textbook boards, assessment departments, teacher training departments, *deeni madaris*, public and private publishers, private schools, and private school associations all contributed their expertise to ensure that the National Curriculum could meet the needs of all Pakistani students.

The experiences and collective wisdom of these diverse stakeholders enrich the National Curriculum, fostering the core, nation-building values of inclusion, harmony, and peace, making the National Curriculum truly representative of our nation's educational aspirations and diversity.

I take this opportunity to thank all stakeholders, including students, teachers, and parents who contributed to developing the National Curriculum of Pakistan (2022-23)

Dr. Mariam Chughtai

Director

National Curriculum Council Secretariat

Ministry of Federal Education and Professional Training

Additional
Civil Construction (Road and Bridge Construction Technology)
Progression Grid
Grades 11-12

Domain A: Town Planning

Standard A1: Students will be able to analyze town planning and disaster management with reference to Pakistan.

Grade 11

Benchmark I: Students will be able to define and explain the basics of town planning.

Student Learning Outcomes

Students will be able to:

[SLO:CC-11-A-01]:
Define Town Planning

[SLO:CC-11-A-02]:
Explain the importance of town planning

[SLO:CC-11-A-03]:
Differentiate between plan and map

[SLO:CC-11-A-04]:

Identify the differences between planned and unplanned Townships

[SLO:CC-11-A-05]:

Analyze the Progressive Approach of Town planning in Pakistan

Benchmark II: Students will be able to enlist and explain the factors affecting town planning.

Student Learning Outcomes

Students will be able to:

[SLO:CC-11-A-06]:

Assess Environmental Impacts associated with Town Planning like use of land, resources and infrastructure use, Transportation, Air and water quality, Climatic changes, social and economic factors etc.

[SLO:CC-11-A-07]:

Define and explain disaster management with reference to town planning

Domain B: Drainage System

Standard B1: Students will be able to explain drainage systems and measures for effective solid waste management.

Grade 11

Benchmark I: Students will be able to describe the drainage system.

Student Learning Outcomes

Students will be able to ...

[SLO:CC-11-B-01]:
Describe the drainage system and its components

[SLO:CC-11-B-02]:
Describe the need of an equipped Drainage System

[SLO:CC-11-B-03]:
Differentiate between types of drainage system

[SLO:CC-11-B-04]:
Explain Channelized drainage system

Benchmark II: Students will be able to explain waste management and methods of water treatment.

Student Learning Outcomes

Students will be able to...

[SLO:CC-11-B-05]:
Define the term 'water treatment'

[SLO:CC-11-B-06]:
Explain the conditions under which water treatment is needed.

[SLO:CC-11-B-07]:
List and explain methods of water treatment

[SLO:CC-11-B-08]:
Explain the measures for effective solid waste management

Domain C: Water Supply

Standard C1: Students will be able to explain the development of water supply systems for a community.

Grade 11
Benchmark I: Students will be able to differentiate between different water supply systems
Student Learning Outcomes
Students will be able to: [SLO:CC-11-C-01]: Explain the basic concept of water supply system [SLO:CC-11-C-02]: Describe the development of water supply system [SLO:CC-11-C-03]: Differentiate between types of water supply system
Benchmark II: Students will be able to explain International Guidelines related to use of water
Student Learning Outcomes
Students will be able to: [SLO:CC-11-C-04]: Define water demand [SLO:CC-11-C-05]:

Explain the International Standards for Water Supply Management

[SLO:CC-11-C-06]:

Calculate water demand of a community by using per capita demand mentioned by standards

[SLO:CC-11-C-07]:

Define Water Catchment and reservoir.

Domain D: Communication Network

Standard D1: Students will be able to differentiate between types of communication networks

Grade 11

Benchmark I: Students will be able to illustrate communication networks and historical development of transportation

Student Learning Outcomes

Students will be able to:

[SLO:CC-11-D-01]:

Define communication networks and explain their importance

[SLO:CC-11-D-02]:

Explain the Historical Development of transportation w.r.t Pakistan

Benchmark II: Students will be able to differentiate between types of communication networks

Student Learning Outcomes

Students will be able to:

[SLO:CC-11-D-03]:

List and explain different Modes of Communication Networks i.e. Roads, Railways, Airways, Seaways.

Grade 12

Domain E: Road Networks

Standard E1: Students will be able to explain the operation and types of roads with respect to traffic engineering.

Grade 12

Benchmark I: Students will be able to explain the different types of roads

Student Learning Outcomes

Students will be able to:

[SLO:CC-12-E-01]:

Explain the history of Roads

[SLO:CC-12-E-02]:

Differentiate between types of roads w.r.t material

[SLO:CC-12-E-03]:

Differentiate between flexible and rigid pavement

[SLO:CC-12-E-04]:
Differentiate between types of roads w.r.t Soil Bearing Capacity

[SLO:CC-12-E-05]:
Define bearing capacity of soil and elaborate the method to measure it.

Benchmark II: Students will be able to explain traffic engineering

Student Learning Outcomes

Students will be able to

[SLO:CC-12-E-06]:
Explain the need and importance of operation of roads; Marking, Sign and Signal, Speed bumps, Dividers

[SLO:CC-12-E-07]:
Define Interchange and enlist its types.

Domain F: Bridge and Culvert

Standard F1: Students will be able to explain the difference between bridge and culvert.

Grade 12

Benchmark I: Students will be able to differentiate between

Student Learning Outcomes

Students will be able to

[SLO:CC-12-F-01]:
Define bridge and culvert

[SLO:CC-12-F-02]:
Identify some historical bridges (examples can be taken from local and/or international context)

[SLO:CC-12-F-03]:
Explain bridge disasters with some suitable examples

Benchmark II: Students will be able to Differentiate between types of bridges and culverts and explain technical terms related to them.

Student Learning Outcomes

Students will be able to:

[SLO:CC-12-F-04]:
Differentiate between types of bridges and culverts

[SLO:CC-12-F-05]:
Define technical terms related to Bridges and culverts like Span of Bridge, Joints of Bridges, Apron and Barrel of culvert

[SLO:CC-12-F-06]:
Enlist and define components of bridge and culvert

Domain G: Material

Standard Y: Students will be able to evaluate different materials used in road's construction

Grade 12

Benchmark I: Students will be able to evaluate different materials used in road's construction

Student Learning Outcomes

Students will be able to

SLO:CC-12-G-01]:

Explain the evolution of materials in civil engineering from ancient times till now

SLO:CC-12-G-02]:

Identify the materials used in different types of roads; rigid and flexible roads.

Benchmark II: Students will be able to organize concreting in different critical conditions

Student Learning Outcomes

Students will be able to:

[SLO:CC-12-G-03]:

Explain types of concrete

[SLO:CC-12-G-04]:
Explain how concreting is done under special conditions like under water, in hot and cold weather

[SLO:CC-12-G-05]:
Explain the sampling of materials.

[SLO:CC-12-G-06]:
Define Admixture and explain its types.

Domain H: Utilities Line

Standard H1: The students will be able to describe utility lines, their importance and their planning

Grade 12

Benchmark I: Students will be able to explain the importance of utility lines

Student Learning Outcomes

Students will be able to

[SLO:CC-12-H-01]:
Define and enlist utility lines.

[SLO:CC-12-H-02]:
Explain the types and importance of different utility lines.

[SLO:CC-12-H-03]:
Explain the acceptable international standards for utility lines.

Benchmark II: Students will be able to organize effective planning of utility lines

Student Learning Outcomes

Students will be able to:

[SLO:CC-12-H-04]:

Describe the current practice of construction and management of Utility Lines

[SLO:CC-12-H-05]:

Describe the flaws in Coordination with relevant Departments

[SLO:CC-12-H-06]:

Explain how planning of utility lines can be made effective and efficient

Domain I: Maintenance of Roads and Bridges

Standard II: Students will be able to describe the importance of road maintenance and obstacles on road

Grade 12

Benchmark I: Students will be able to describe the importance of maintenance of road

Student Learning Outcomes

Students will be able to

[SLO:CC-12-I-01]:

Describe how to achieve the maintenance of roads and bridges

[SLO:CC-12-I-02]:

Explain the importance of periodic maintenance of roads and bridges

[SLO:CC-12-I-03]:

Explain the historical significance of periodic maintenance

Benchmark II: Students will be able to organize the maintenance of roads

Student Learning Outcomes

Students will be able to:

[SLO:CC-12-I-04]:

Elaborate the procedure of road's maintenance

[SLO:CC-12-I-05]:

Explain the advantages and disadvantages of providing Toll Plaza on road.

[SLO:CC-12-I-06]:

Explain the importance of obstacles in roads like speed bumps, cat-eyes, reflectors, destruction over roads and repair work



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