

MIKE+ TRAINING PROGRAMME for 1D/2D River Modelling

Tab. 1 Day 1 – Foundations of 1D Hydrodynamic River Modelling

Day 1 - Foundations of 1D Hydrodynamic River Modelling	
<u>Session</u>	<u>Scope</u>
Session 1 (1.5 h)	Introduction & Theoretical Background • Introduction to MIKE+ software environment • Overview of 1D hydrodynamic river modelling concepts • Governing equations and modelling assumptions • Typical applications and limitations of 1D river models
Session 2 (1.5 h) –	Data Requirements & Model Setup • Required input data for 1D river modelling • Spatial data overview (river geometry, cross-sections, DEM) • Introduction to: ◦ Graphical User Interface (GUI) ◦ Model Manager ◦ Databases and project structure
Session 3 (3.0 h)	Practical Exercises: First River Model • Creating a new river model project • Importing river geometry from SHP files • Editing river alignment • Creating cross-sections, extending cross-sections using a Digital Elevation Model (DEM) • Running a basic simulation • Review of basic model results

Outcome Day 1:

Participants can create and run a basic 1D river model in MIKE+.

Tab. 2 Day 2 - Catchment Processes, Stability & Hydraulic Structures

Day 2 - <u>Catchment Processes, Stability & Hydraulic Structures</u>	
<u>Session</u>	<u>Scope</u>
Session 4 (1.5 h)	Catchment Runoff Modelling • Overview of rainfall–runoff modelling concepts • Catchment representation in MIKE+ • Linking catchment runoff to the river model • Practical example: simple catchment setup
Session 5 (1.5 h) –	Model Stability, Calibration & Validation • Numerical stability of 1D river models • Common stability issues and troubleshooting • Calibration principles • Model verification and validation approaches • Practical exercises on stability improvement and calibration
Session 6 (3.0 h)	Hydraulic Structures & Results Analysis • Introduction to modelling basic hydraulic structures • Practical exercises: ◦ Weirs, culverts, gates (basic structures) • Tips & tricks for efficient 1D hydrodynamic modelling • Results inspection: ◦ Time series and charts ◦ Longitudinal profiles

Outcome Day 2:

Participants can model catchment runoff, improve model stability, and include basic hydraulic structures.

Tab. 3 Day 3 – Advanced & Integrated Modelling (1D / 1D–2D)

<u>Day 3 – Advanced & Integrated Modelling (1D / 1D–2D)</u>	
<u>Session</u>	<u>Scope</u>
Session 7 (1.5 h)	Introduction to MIKE+ 2D Overland • Modelling requirements and mathematical background ◦ Upstream discharge ◦ Downstream water level • Model inputs: ◦ 2D domain, wetting and drying, surface roughness • 2D boundary conditions
Session 8 (1.5 h) –	Running Simulations & Results Analysis • Configuration and execution of river simulations • Model stability • Results inspection: ◦ Time-varying maps of water depths, surface elevation, velocities ◦ Statistical results maps ◦ Result map animation
Session 9 (3.0 h)	Integrated & Advanced Modelling • Integration of river model with sewer systems (river–collector connections) • Coupling of 1D river models with flexible mesh (1D–2D): ◦ Configuration principles, key settings • Advanced hydraulic structures and applications • Course summary, final discussion & evaluation

Outcome Day 3:

Participants understand integrated modelling concepts and are able to configure advanced MIKE+ river applications.

Time Schedule (can be adjusted according to customer needs)

Day 1 – Foundations of 1D Hydrodynamic River Modelling

Time	Topic
09:00 – 10:30	Session 1
10:30 – 10:45	Coffee break
10:45 – 12:15	Session 2
12:15 – 13:00	Lunch break
13:00 – 13:15	Coffee break
13:15 – 15:45	Session 3

Day 2 – Catchment Processes, Stability and Hydraulic Structures

Time	Topic
09:00 – 10:30	Session 4
10:30 – 10:45	Coffee break
10:45 – 12:15	Session 5
12:15 – 13:00	Lunch break
13:00 – 13:15	Coffee break
13:15 – 15:45	Session 6

Day 3 – Advanced and Integrated Modelling (1D / 1D–2D)

Time	Topic
09:00 – 10:30	Session 7
10:30 – 10:45	Coffee break
10:45 – 12:15	Session 8
12:15 – 13:00	Lunch break
13:00 – 13:15	Coffee break
13:15 – 15:45	Session 9