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HYDRAULICS

UNIFORM FLOW IN OPEN CHANNEL
TOPIC 2.3

by

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UNIFORM FLOW IN OPEN CHANNEL

2.3

- Design of Open Channels (Typical Open Channel)

2.3 : DESIGN OF OPEN CHANNEL (TYPICAL OPEN CHANNEL)

- A critical topic in the area of open channel hydraulics in the design of channels capable of transporting water between two points in a safe, cost effective manner.
- Although economics, safety and esthetics must always be considered, only the hydraulic aspects of channel design will be examined.
- The design channels for uniform flow divides by three types of channels:
  - •Lined or non erodible
  - •Unlined, earthen or erodible
  - •Grass lined

Table 2.4 Geometry of open channel section

	Rectangle	Trapezoid	Circle
Area, A	by	$(b+xy)y$	$\frac{1}{8}(\phi-\sin\phi)D^2$
Wetted perimeter, P	$B+2y$	$b+2y\sqrt{1+x^2}$	$\frac{1}{2}\phi D$
Top width, B	b	$b+2xy$	$\left(\sin\frac{\phi}{2}\right)D$
Hydraulic Radius, R	$\frac{by}{b+2y}$	$\frac{(b+xy)y}{b+2y\sqrt{1+x^2}}$	$\frac{1}{4}\left(1-\frac{\sin\phi}{\phi}\right)D$
Hydraulic Mean depth, D_m	y	$\frac{(b+xy)y}{b+2xy}$	$\frac{1}{8}\left(\frac{\phi-\sin\phi}{\sin(1/2\phi)}\right)D$

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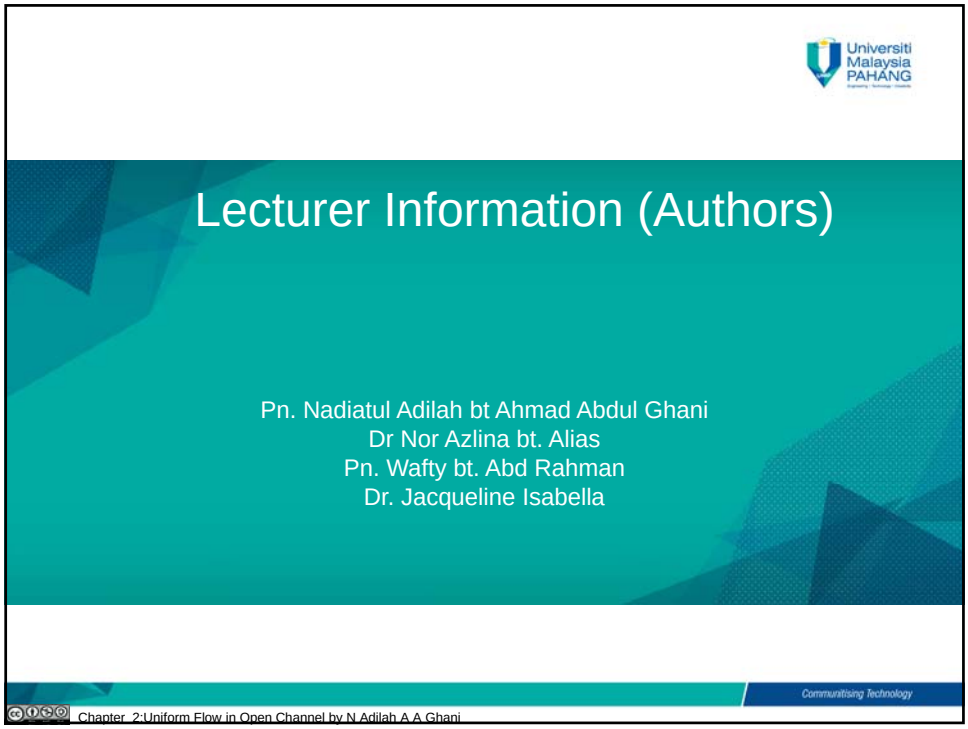
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