*

SAULT COLLEGE OF APPLIED ARTS % TECHNOLOGY

SAULT STE. MARIE*t* ONTARIO

COURSE QUILIblE

HYDRAULICS

Course Titlel

HYD 220-5

Code No.*I*

WATER RESOURCES/PULP AND PAPER

Program}

FALL

Semester?

SEPTEMBER* 1984

D3tet

S»C. YERMA

Author*

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NewJ_____Revision? _____

APPROVED!._____
      Chairperson   Date

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EEEBEQUISIIE: PHY 100? MTH 2/8

EHIL.QSQEHY./GQALS,

To introduce the basic principles of fluid mechanics and the application o
these principles to practical and applied problems* After completing this
course the student should have 3 firm foundation in the field to continue
learning. This course will provide the understanding of basic concepts of
fluid mechanics 3nd application of these concepts to solve practical
problems in the area of specialization*

On completion of the courser the student should be able tot

- To work with both English and SI Units and modification fo mathematical
  eauation from one system of units to the other.

- Clear understanding of the properties of fluids? factors affecting? and
  their role in influencing the hydraulic design.

~ To 3PPly the energy eau3tion to a given hydraulic system to derive the
  answer for the unknown parameter.

- Apply the principles of fluid mechanics to the computation of energy?
  power? and pressure within fluid.

- Apply the principles of hydraulics to understand the operation snd
  working principles of flow control and flow measuring devices.

- Calculate W3ter snd power requirements and select such components as
  pumps and valves.

- Analyse open channel and pipe flow to such systems as water supply? wet
  distribution? S3nitsry and storm sewers.

~ Maintain a laboratory notebook.

- Interpret and analyze the data.

MEIBQD QE ASSESSMENT 6UD EU6LU&IIub!

The final mark will be assigned which is higher of either
a) final examination mark
b) weighted mark calculated 3S follows^

Problem assignments and Laboratory reports	25%
Hid-term examination (2)	25%
Final examination	50%

- To pass this course a minimum of 55% is reauired in the weighted average provided a pass grade is obtained in at least one of the tests.

- Eighty percent attendance is reouired for anyone to be considered for supplementary examination.

- Home assignments are due one week 3fter. Late submissions will be penalized*

- This method of evaluation is subjected to change. However students wil be notified prior to any changes.

IEXIBDQKiSi:

Matt? Robert? ftE&lied Eluid Mechanics* Second Edition? Charles E. Merrill Publishing Company? Toronto.

BEEEBENCES:

Daugherty? R.L.? and J.B. Fransini (1977)? Eluid Mechanics Uitb Enginees: ^EElications? 7th Edition? McGraw-Hill Book Company? Toronto.

Kins? H.U.? CO. Uisler 3nd J.G. Woodburn (1980)? Hydraulics? 5th Editio Robert E. Krieger Publishing Company? Huntington? New York.

1» Inir.aduciioD.i units and calculations   (1)

2. EroEecties of fluids   CI.)

3. Eluid Eiessuie and its measurement   (2)

   - fluid pressure
   - absolute 3nd gauge pressure
   - relationship between pressure and elevation
   - manometers» barometers and pressure gauges

4. Eundamenials a£ fluid flaw   (4)

   - types of flows
   - continuity eouation
   - energy and head
   - Bernoulli's ectuation
   - applications of Bernoulli's eouation
   - energy loss and gain
   - general energy equation
   - application of general energy eouation

5. Eluid measurements

   - general methods of local velocity measurements
   - orifices* nozzles and tubes
   - weirs
   - other methods

6. Steady com&cessible flow in Eiessure conduits

   - laminar and turbulent flow
   -- friction formulas
   - energy gradient and hydraulic gradient
   - minor losses
   - solution of pipe flow problems

7. EuoiBing systems

   - parameters involved in pump selection
   - types of pumps
   - static head and dynamic head

8» Steady uniform flow in DEED channels

   - open channel flow defined
   - eouations of uniform flow
   - efficient cross-section
   - specific energy and critical flow
   - hydraulic pump