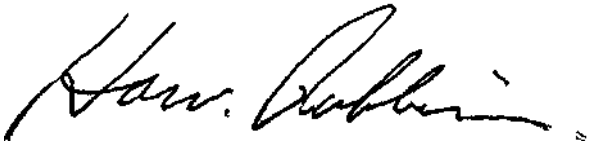
SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title:	WATER WELLS & PUMPS
Code No.:	WTR 313-5
Program;	WATER RESOURCES
Semester	VI
Date	1983-10-25
Author:	S. VERMA

New: _____ Revision;

APPROVED; 

Chairperson Date

WATER RESOURCES
WTR 313-5
WATER WELLS S PUMPS

WATER WELLS & PUMPS	WTR 313-5
Course Name	Course Number

OBJECTIVES;

Ar the end of the semester, the student should be able to:

1. Relate the geology of an area to ground water resources development.
2. Identifying factors affecting pump and well performance.
3. Identifies concepts, definitions and computations of system efficiency.
4. Recognize and use of concepts in designing components of new systems and improving existing systems.

EVALUATION:

Laboratory Exercises	25%
Field Reports	5%
Mid-term Examination	25%
Final Examination	45%

FIELD TRIPS;

Wherever possible field trips will be made to observe well drilling, existing well and pumping systems. Municipal or Industrial Water treatment plants and water distribution systems.

TEXTBOOK(S);

Johnston, Edward E, Inc., Ground Water and Wells, Johnson Division, VOP Inc.

REFERENCES

Heloveg, Otto J., Scott, V.H., and Scalmanini, J.C., Improving Well and Pump Efficiency, American Water Words Association, 1983.

WATER RESOURCES
WTR 313-5
WATER WELLS & PUMPS

REFERENCES

Karassik, I.J., Krutzsch, W.C., Eraser, W.H., and Messina, J.P., Pump Handbook, McGraw-Hill Book Company, Toronto, 1976.

Flygt, Production Education Manual, Canada.

Environment Protection Agency, Manual of Well Water Construction Practices, National Technical Information Service, Springfield, Virginia.

COURSE OUTLINE;

1. Well Drilling
   - cable-tool percussion method
   - hydraulic rotary drilling
   - reverse rotory drilling
   - driven wells

2. Water-Well Design
   - well screen design
   - gravel-pack design
   - sanitary protection

3. Developing Wells
   - mechanical surging
   - hydraulic surging
   - overpumping and backwashing

4. Pumps
   - kinds of pumps and their uses
   - positive displacement pumps
   - centrifugal pumps
   - submersible pumps
   - pump selection
   - pump characteristic curves

5. Analysis of Well and Pumping Systems
   - concepts of efficiency
   - well and pumping plant testing and analysis
   - evaluating wells
   - evaluating pumps
   - economics of improving efficiency

WELL DRAWDOWN TEST

WATER WELLS AND PUMPS

(WTR 313)

NAME;

DATA FOR WELL NAME OR NUMBER: (pumped well)

(observation well for pumped well)

WELL LOCATION:

WELL OWNER!

DATUM: (reference point and elevation)

% STATIC WATER LEVEL (SWL)

START TEST: Date: Time: STOP Test: Date Time:

OBSERVATION WELLS:	#1 Name or No.	#2 Name or No. __
	Depth	Depth _____
	Diameter	Diameter ___
	Distance from pumped well ___	Distance from pumped well ___
	Datum _____	Datum _____
	SWL	SWL

Attach well logs and all completion information (casing sizes, location of screens, perforation, gravel pack, etc.)

%

1 6 10 11

Time	Elapsed Time t	Recovery t"	Increment Discharge' Q	Discharge Q	Water R	Drawdown S or Residual S'	Pressure P	Others
( )	( )	( )	( )	{)	( )	lf{)	{)	