

fact that the textbook does not include all of the necessary material for students to adequately prepare for their tests. The additional documents and resources provide students with the necessary information and practice needed to understand the material and excel in the course.



Engineering Economics – Lecture Notes

The computation of a mortgage balance includes the payment, which is equal for all five years.

$$A = P \frac{(1+i)^n i}{(1+i)^n - 1}$$

where P is the initial amount of the loan and A is the regular required payment.

Example 1. Suppose a house value is \$200,000.00, to be paid by 10 equal payments.

$$\frac{(1 + 0.05)^{10} A}{(1 + 0.05)^{10} - 1} = \$14,903$$

Shortcut Computations

Year	Balance	Interest	Payment	Reduction	Final
0	\$200,000				
1	\$185,000	\$10,000	\$14,903	\$14,903	\$170,100
2	\$170,100	\$8,505	\$14,903	\$14,903	\$155,200
3	\$155,200	\$7,760	\$14,903	\$14,903	\$140,300
4	\$140,300	\$7,015	\$14,903	\$14,903	\$125,400
5	\$125,400	\$6,270	\$14,903	\$14,903	\$110,500
6	\$110,500	\$5,525	\$14,903	\$14,903	\$95,600
7	\$95,600	\$4,780	\$14,903	\$14,903	\$80,700
8	\$80,700	\$4,035	\$14,903	\$14,903	\$65,800
9	\$65,800	\$3,290	\$14,903	\$14,903	\$50,900
10	\$50,900	\$2,545	\$14,903	\$14,903	\$36,000

Reduction of balance = \$14,903 – \$8,000 = \$6,903

Final balance = \$110,500 – \$6,903 = \$103,600

With this process the amount of principal is reduced, the amount of interest is the same and the amount of payment is the same.

Shortcut computations

The computations of every row can be estimated without the need to compute the interest and principal balance for each year.

$$A = P \frac{(1+i)^n i}{(1+i)^n - 1}$$

$$A = \$14,903$$

$$P = \$200,000$$

$$i = 0.05$$

$$n = 10$$

Liquidating the loan

The amount of principal is reduced, the amount of interest is the same and the amount of payment is the same.

4. Course Improvement- INEN 2373_48F Engineering Economics

Identification

After teaching this course in the Spring 2021, I found that most students did not spend extra time in solving additional textbook problems. Just solving the homework problems is not enough for students to succeed and get good grades in this course.

Improvement

With the help of Textbook- McGraw Hill online learning management service, I assigned 10% credits to students who completes the Reading Assignments for each chapter. In addition to the Homework, students started spending time and solving reading assignment problems which helps understand the conceptual knowledge.

Result

Including the Reading Assignments under the final grades significantly increased the student participation in solving the textbook problems and very well understood the conceptual knowledge for each chapter. The student participation in completing reading assignment was 30% in the Spring 2021 semester which jumped up to 80% in the Spring 2022 semester. This way students got better conceptual understand and improved the ability to solve homework and exam problems.

5. Course Improvement- INEN 2373_48F Engineering Economics

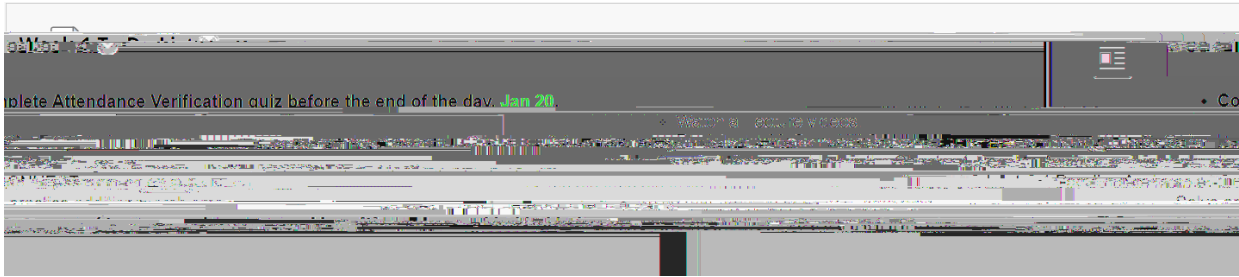
Identification

Students tend to forget the homework due dates and don't quite remember what needs to be done on weekly basis.

Improvement

I created a simple to read To-Do list with bullet points on blackboard. Each weekly folder has it's own To-Do List with a list of things to do for the week including the due dates and Click Here links to help them easily navigate to the right content of the course.

Below screenshot shows an example Week-1 To-Do List form my Bb course.



Results

Students developed a habit of referring to the To-Do List to simply keep track of their weekly tasks and activities on the course. I did notice that most students tend to complete the homework way before the due date, rather than submitting their work at the last minute in the previous semesters.

6. INEN 2373 Engineering Economics Fall 2021 to Fall 2022

Identification:

INEN 2373 is required for most engineering students. Most students found it very difficult: complex concepts and difficult problems. After investigation, the instructor realized that most students never worked on the problems except homework.

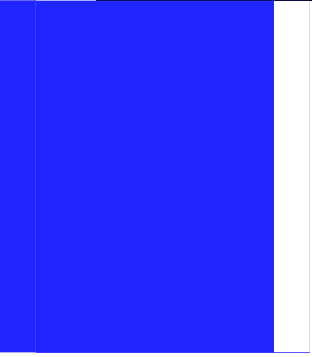
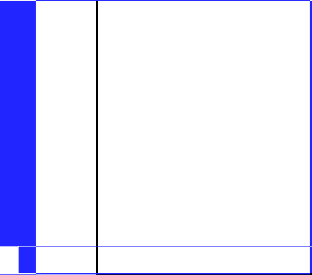
Improvements:

The instructor developed an in-class-practice session. It was around 10 minutes in the beginning of each class, in which the instructor worked on one problem together with students. The question was carefully selected from the textbook or was developed by the instructor. It is usually an intermediate level question and contains the most important concepts in a real life scenario. The instructor will make sure all students in class can solve the problem by themselves.

Results:

Students enjoyed the in-class-practice session. They said they found it easier to do the homework after attending the in-class-practice session. Working on the problem together with students also helps the instructor to check the quality of teaching.

Identify and briefly discuss any programmatic curriculum changes made since the last report (e.g. new courses, course changes, SLO changes, course deletions).



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