Recovery Year	3-Year Property	5-Year Property	7-Year Property	10-Year Property	15-Year Property	20-Year Property
1	33.33%	20.00%	14.29%	10.00%	5.00%	3.75%
2	44.45%	32.00%	24.49%	18.00%	9.50%	7.22%
3	14.81%	19.20%	17.49%	14.40%	8.55%	6.68%
4	7.41%	11.52%	12.49%	11.52%	7.70%	6.18%
5		11.52%	8.93%	9.22%	6.93%	5.71%
6		5.76%	8.92%	7.37%	6.23%	5.29%
7			8.93%	6.55%	5.90%	4.89%
8			4.46%	6.55%	5.90%	4.52%
9				6.56%	5.91%	4.46%
10				6.55%	5.90%	4.46%
11				3.28%	5.91%	4.46%
12					5.90%	4.46%
13					5.91%	4.46%
14					5.90%	4.46%
15					5.91%	4.46%
16					2.95%	4.46%
17						4.46%
18						4.46%
19						4.46%
20						4.46%
21						2.23%

LECTURE 6
CHAPTER 2, 9, 10

Mr. Belly is planning to purchase a system for auto rent collection of his properties.
The initial cost of $40,000 for this system is depreciated over 5-year period.
It is expected to have a $8,000 salvage value at the end of 5 years.
Using the straight-line method:

Calculate the annual depreciation allowances. [5 points]
Calculate the annual book values. [5 points]

GIVEN:

I	$40,000
N	5
S	$8,000

$$D_n = \frac{(I - S)}{N}$$

Dn **$6,400**

n	**BVn-1**	**Dn**	**BVn**
1	$40,000	$6,400	$33,600
2	$33,600	$6,400	$27,200
3	$27,200	$6,400	$20,800
4	$20,800	$6,400	$14,400
5	$14,400	$6,400	$8,000

LECTURE 6
CHAPTER 2, 9, 10

A circuit printing machine with a first cost of $150,000 is depreciated over 5-year period.
It is expected to have a $15,000 salvage value at the end of 5 years.
Using the double-declining balance method:

a. Calculate the annual depreciation allowances. [4 points]
b.Calculate the annual book values. [4 points]
c. What do you notice about the book value at the end of year 5? What does this mean? [1 + 1 p

GIVEN:

I	$150,000
N	5
S	$15,000
multiplier	2
α	0.4

$$D_n = \alpha I(1-\alpha)^{n-1}$$

$$\alpha = \left(\frac{1}{N}\right)(multiplier)$$

n	BVn-1	Dn	BVn
1	$150,000	$60,000	$90,000
2	$90,000	$36,000	$54,000
3	$54,000	$21,600	$32,400
4	$32,400	$12,960	$19,440
5	$19,440	$7,776	***$11,664***

c. What do you notice about the book value at the end of year 5? What does this mean? [1 + 1 p

The book value at the end of year 5 is < salvage value ($15,000)

If $BV_N < S$,
Asset depreciated below salvage value resulting in a tax law violation
For any year n, if BVn < S, the depreciation amounts are adjusted so that BVn = S

n? [1 + 1 point]

n? [1 + 1 point]

LECTURE 6
CHAPTER 2, 9, 10

Mr. White & Partners purchased a new pill packaging machine, which cost $45,000. The system was estimated to have a service life of 5 years with salvage value of $8,000. The property has been depreciated according to a 5 year MACRS property class. You are considering selling the asset for $10,000 after 5 years

a. Calculate the annual depreciation allowances over 5 years. [4 points]
b. Calculate the annual book values over 5 years. [4 points]
c. Is there a capital gains or loss? What is it? [1 + 1 point]

GIVEN:

I	$45,000
N	5
S	$8,000
Sales Price	$10,000

n	BVn-1	5-year MACRS	Dn	BVn
1	$45,000	20.00%	$9,000	$36,000
2	$36,000	32.00%	$14,400	$21,600
3	$21,600	19.20%	$8,640	$12,960
4	$12,960	11.52%	$5,184	$7,776
5	$7,776	11.52%	$5,184	$2,592

c. Is there a gain or loss? What is it? [1 + 1 point]

Sales Price	**$10,000**
BV_5	**$2,592**

Gain / Loss	**Gain**
Value	**$7,408**

Yes, there is a gain of $7408 that will be subject to capital gains tax laws.

Mr. White

LECTURE 7
CHAPTER 9, 10

A manufacturing system for a new alopecia fighting drug requires an initial investme and will generate $300,000 in revenue in year 1. The system will incur $90,000 in general expenses, in the first year. The investment cost of all the equipment neces the drug is classified as a 5-year MACRS property for depreciation purposes. The exp salvage value of all the equipment is $50,000 at the end of the project life. The firm p a rate of 30% and has a MARR of 12%. The manufacturing system has a 6-year life. I year and expenses will increase at 5% each year. A loan is to be taken out for 10% investment amount. The loan will be repaid over the project life in equal payments, a of 11%.

Calculate the following:
a. Determine the allowed depreciation amounts [3 points]
b. Calculate the repayment schedule of the loan [3 points]
c. Calculate the Gains (Losses) associated with Asset Disposal [1 points]
d. Create the Income Statement [5 points]
e. Develop a Cash Flow Statement [5 points]
f. Is this project justifiable at a MARR of 10%?
Calculate the NPV [1 point]
Calculate IRR [1 point]
State your conclusions. [1 point]

GIVEN:

I	$900,000	
S	$50,000	
N	6	
A (rev)	$300,000	
A (exp)	$90,000	
Loan @	10%	. . . Equal Repayments
MARR	12%	
Tax Rate	30%	
Debt:Equity	10%	
revenue inc	7%	
expense inc	5%	

a. Determine the allowed depreciation amounts [3 points]

I	$900,000
N	6
S	$50,000
MACRS	5-year

As N = 5; the allowable amounts are as follows:

n	BV_{n-1}	MACRS	D_n	BV_n

1	$900,000	20.00%	$180,000	$720,000
2	$720,000	32.00%	$288,000	$432,000
3	$432,000	19.20%	$172,800	$259,200
4	$259,200	11.52%	$103,680	$155,520
5	$155,520	11.52%	$103,680	$51,840
6	$51,840	5.76%	$51,840	$0

b. Calculate the repayment schedule of the loan [3 points]

P, amount borrow	$90,000
i	10%
N	6
AE	$20,665

Year	Beginning Balance	Interest Payment	Principal Payment	Ending Balance
1	$90,000	$9,000	$11,665	$78,335
2	$78,335	$7,834	$12,831	$65,504
3	$65,504	$6,550	$14,114	$51,390
4	$51,390	$5,139	$15,526	$35,864
5	$35,864	$3,586	$17,078	$18,786
6	$18,786	$1,879	$18,786	$0

c. Calculate the Gains (Losses) associated with Asset Disposal [1 points]

Salvage Value	
S	$50,000
Book Value	
BV_6	$0
Taxable Gains (Losses)	
	$50,000
Taxes (Capital Gains, rate = 30%)	
Rate (S - BV_5)	$15,000

d. Create the Income Statement [5 points]

Income Statement	**0**	**1**	**2**	**3**	**4**
Revenues		$300,000	$321,000	$343,470	$367,513
Expenses:					
General		$90,000	$94,500	$99,225	$104,186
Depreciation		$180,000	$288,000	$172,800	$103,680
Debt Interest		$9,000	$7,834	$6,550	$5,139
Taxable Income		$21,000	-$69,334	$64,895	$154,508
Income Taxes (30%)		$6,300	-$20,800	$19,468	$46,352
Net Income		$14,700	-$48,533	$45,426	$108,155

e. Develop a Cash Flow Statement [5 points]

Cash Flow Statem	**0**	**1**	**2**	**3**	**4**
Operating Activities:					
Net Income		$14,700	-$48,533	$45,426	$108,155
Depreciation		$180,000	$288,000	$172,800	$103,680
Investment Activities:					
Investment	-$900,000				
Salvage					
Gains Tax					
Working Capital					
Financing Activities:					
Borrowed Funds	$90,000				
Principal Repayment		-$11,665	-$12,831	-$14,114	-$15,526
Net Cash Flow	-$810,000	$183,035	$226,635	$204,112	$196,310

f. Is this project justifiable at a MARR of 12%?

Calculate the NPV [1 point]

n	P	F	(P/F, i, n)	F*(P/F, i, n)
0	-$810,000	-	-	-
1	-	$183,035	0.8929	$163,424
2	-	$226,635	0.7972	$180,672
3	-	$204,112	0.7118	$145,283
4	-	$196,310	0.6355	$124,758
5	-	$210,206	0.5674	$119,276
6	-	$244,581	0.5066	$123,912

PW manual **$47,327**

Calculate IRR [1 point]

IRR 13.98%

n	P
0	-$810,000
1	$183,035

2	$226,635
3	$204,112
4	$196,310
5	$210,206
6	$244,581

State your conclusions. [1 point]

This project is justifiable as the PW is < 0 at $47,327

In addition the IRR is greater than the 12% MARR at 13.98%

l investment of $900,000

nent necessary to produce
s. The expected
. The firm pays taxes at
year life. Revenue will increase at 7% each
t for 10% of the initial
ayments, at an interest rate

A manufacturing system for a new alo

5	6
$393,239	$420,766
$109,396	$114,865
$103,680	$51,840
$3,586	$1,879
$176,577	$252,182
$52,973	$75,654
$123,604	$176,527

5	6
$123,604	$176,527
$103,680	$51,840
	$50,000
	-$15,000
-$17,078	-$18,786
$210,206	$244,581

r a new alopecia fighting drug requires an initial investment of $900,000and will generate $300,000 in revenue in year 1.