Lab Practical

• During Class – April 4 or 5 (No regular class)

• Solve an engineering problem using a spreadsheet
  – Enter formulas using absolute & relative addressing
  – Use Predefined Functions (linear regression)
  – Plot 2 data sets on same graph
  – Add a regression line

• 20 Minutes – time your choice
Exam Review

• Variable assignments
• Flowcharting
  – Asked to draw a flowchart
  – Given a flowchart may be asked to write vba code
• Spreadsheets
  – Absolute & relative addressing
  – Creating graphs (label and caption)
Exam Review

• Functions
  – Function definition line
  – How to call
  – How do you transfer information into and out of a function

• Macros
  – Dimensioning variables
    • Option explicit
    • Dim varname as vartype
  – Sub definition line
  – How do you transfer information into and out of a function
  – How to run
Exam Review

• Flow Control
  – Conditional Statements
    • If/Then
    • If/Then/Elseif/Else
  – For Loops
    • For counter=start to finish
    • Stepsize
Exam Review

• Math Model
  – Use law of cosines
    • Dop
    • Ls
  – Use Moments to determine force
    • Farm
    • Fwheel
  – Break a force into its x and y components
    • Ts
VBA Example Problems

Function test(x, b, y)
For k=1 to 4
    y=x^2-3
    If y<b Then
        b=y
    End If
    x=x+1
Next k
test = y
End Function

<table>
<thead>
<tr>
<th></th>
<th>k</th>
<th>b</th>
<th>x</th>
<th>y</th>
</tr>
</thead>
</table>
| Initial
| First
| Second
| Third
| Fourth
Sub Program ()
A=1
b=2
x=9
If x=5 Then
   A=0.5\times x
Elseif x>7 Then
   b=2+x
Else
   c = 2+3\times x
End If
End Sub
VBA Example Problems

- If/Elseif/Else

- For Loop
Option Explicit
Sub xycalc()
Dim x As Double
Dim y As Double
Dim i As Integer
Dim n As Integer

'obtain x from spreadsheet
Sheets("Sheet1").Select
Range("B2").Select
x = ActiveCell.Value

'obtain n from spreadsheet
Range("B3").Select
n = ActiveCell.Value

'activate cell for output
Range("A5").Select

For i = 1 To 10
    If x < 50 Then
        x = 2 * x
        y = x + 10
    ElseIf x >= 70 Then
        y = 5 * x
    Else
        x = x - 2
    End If
    'output i, x, and y to spreadsheet
    ActiveCell.Value = i
    ActiveCell.Offset(0, 1).Select
    ActiveCell.Value = x
    ActiveCell.Offset(0, 1).Select
    ActiveCell.Value = y
    ActiveCell.Offset(1, -2).Select
Next i
End Sub
Option Explicit

Sub rocket()
'dimension variables
Dim t As Integer
Dim ht As Single

'activate cell
Sheets("Sheet1").Select
Range("B7").Select

'loop through time 0 to 100
For t = 0 To 100 Step 2
'calculate height
ht = 60 + 2.13 * t ^ 2 - 0.0013 * t ^ 4 + 0.000034 * t ^ 4.751

'print time and height to spreadsheet
ActiveCell.Value = t
ActiveCell.Offset(0, 1).Select
ActiveCell.Value = ht
ActiveCell.Offset(1, -1).Select

'exit loop if rocket has returned to ground
If ht <= 0 Then Exit For

Next t
End Sub

Rocket returns to ground
Between 62 and 64 seconds
VBA Example Problems

Range("B2").Select
X=ActiveCell.Value
ActiveCell.Offset(2,0).Select
ActiveCell.Value =5