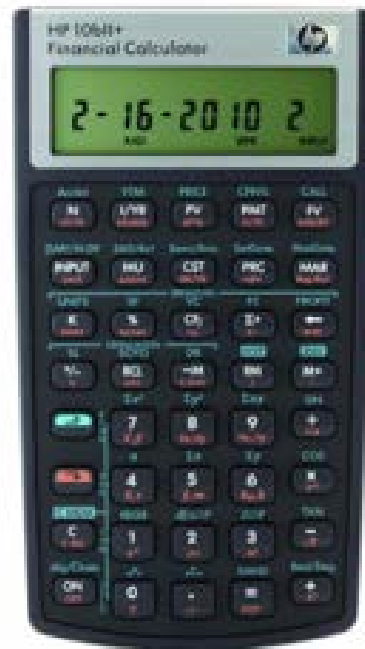




# Real Estate Council of Alberta Education Services



UNIVERSITY OF ALBERTA  
ALBERTA SCHOOL OF BUSINESS

HP 10BII+ FINANCIAL  
CALCULATOR  
TUTORIAL



## INTRODUCTION


There are several tools available for financial analysis of commercial real estate investments. The options range from financial calculators, to spreadsheet modelling, to specialty software programs, such as Argus® Enterprise. However, whatever approach you take, you must understand basic financial concepts in order to use the tool effectively.

The Real Estate Update 2019 course is written for use with the HP 10bII+ financial calculator. Working through the keystrokes on the calculator will help you understand the mechanics of each calculation included in the course. This tutorial teaches you some basic operations of the HP 10bII+ necessary to use the calculator as relates to the course.

## KEYPAD

Every HP 10bII+ key has two or three functions, with the exceptions of the orange and blue shift keys. Each key's primary function is noted in white on the key itself, while each key's secondary function is noted in orange. A tertiary function is noted in blue over the key. Only the primary and secondary functions are used for the purposes of this course.

To use a primary function, select the appropriate key.

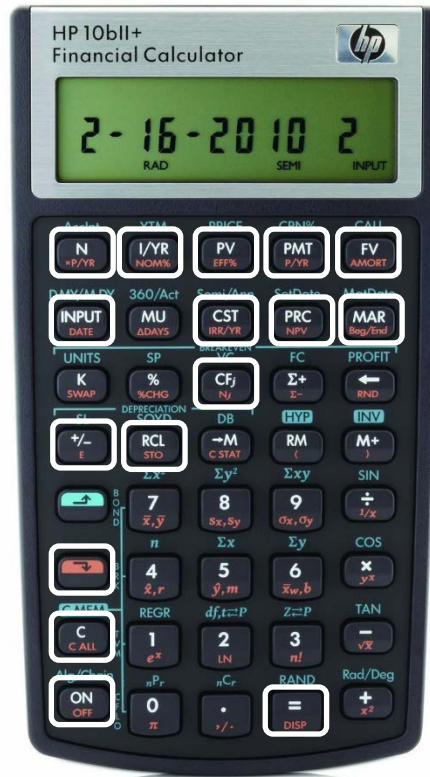
To access the secondary function of a key, first select the orange shift key () and then select the desired function key. The orange shift key is a toggle that switches back and forth between the primary and secondary functions. Selecting the orange shift key places a small shift status indicator in the lower left corner of the display.




Select the shift key again (or any other key) and the symbol disappears.

The following diagram illustrates the keys of the HP 10bII+ used to complete the necessary calculations for the course and their relative location.

**HP 10bII+ FINANCIAL CALCULATOR**



Primary Functions	Secondary Functions
N	
I/YR	NOM%
PV	EFF%
PMT	P/YR
FV	AMORT
INPUT	
	IRR/YR
	NPV
	Beg/End
CFj	
+/-	
RCL	
	
C	C ALL
ON	OFF
=	DISP

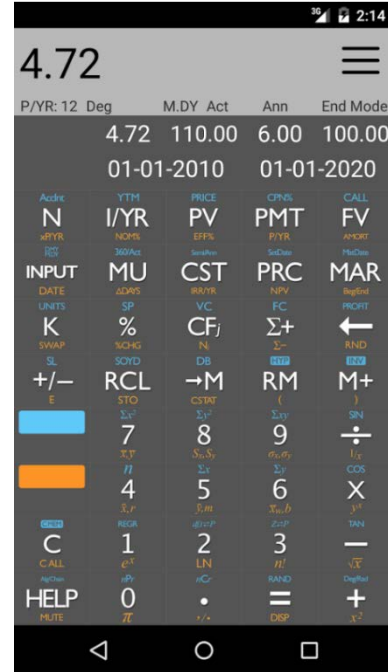
### HP 10bII+ Mobile Apps

If you choose to use a HP 10bII+ app instead of a physical calculator, the keys and screen displays will differ slightly from those shown in this tutorial. For example, in the case of the following two apps, the ON/OFF key is replaced with the HELP key.

**iOS**  
**10bii Financial Calculator**  
(Developed by K2 Cashflow, Inc.)



**Android**  
**10bii Financial Calculator**  
(Developed by In A Day Development)




### HP 10bII+ Keystroke Tables

Throughout this tutorial and the course, a table is used to show which keys to select to perform a particular calculation, what you will see on the display, and any comments needed to clarify the steps.

#### HP 10bII+ Calculator Keystrokes

Select	Display	Notes
What key(s) you select	What you see onscreen	Clarification if necessary
What you do next	What you see next	Clarification if necessary

**NOTE**

The symbol ▼ is used in the HP 10bII+ calculator keystroke tables to indicate that you must select the orange shift key () to activate one of the secondary functions.

### Turning the Calculator On and Off

To turn the calculator on and off:

#### HP 10bII+ Calculator Keystrokes

Select	Display	Notes
ON	0.00	Turns the calculator on and displays 0.00 or the last number in the memory before it was turned OFF.
OFF	Blank	Turns the calculator off.

To conserve the battery, the calculator turns itself off several minutes after your last keystroke. In addition, it has a continuous memory, so turning it off does not erase any data stored in it.

### Changing the Number of Decimal Places

The HP 10bII+ can be programmed to display different numbers of decimal places. Regardless of the number of decimal places displayed, the calculator carries forward accuracy to 12-digits to the right of the decimal place.

To determine the current setting for the number of decimal places to display:

#### HP 10bII+ Calculator Keystrokes

Select	Display	Notes
5555.5555	5,555.5555	Enter any number.
=	5,555.56	The number is rounded to the number of decimal places the HP 10bII+ is currently set to.

To change the number of decimal places from two to four:

HP 10bII+ Calculator Keystrokes		
Select	Display	Notes
▼ DISP 4	5,555.5555	

To change the number of decimal places back from four to two:

HP 10bII+ Calculator Keystrokes		
Select	Display	Notes
▼ DISP 2	5,555.56	

For the purposes of this course, all calculations illustrated and required for activities will be to two decimal places.

### Entering Negative Numbers

When you are performing financial calculations:

- Treat cash flows you are receiving as positive numbers
- Treat cash flows you are paying out as negative numbers

A useful way for keeping track of the signs when using the financial calculator is to imagine the cash flows as they move across an imaginary table between yourself and another individual in a hypothetical transaction. For example, you are the depositor sitting across from a banker and push your initial deposit away from yourself, in a negative direction, toward the banker. At the end of the investment period, you pull the deposit and accumulated interest towards yourself in a positive direction, and away from the banker.

The sign convention has important implications in financial calculations. If the sign convention is not observed, the calculator is unable to calculate a result and 'no Solution' will appear on the display.

To enter a negative number, enter the number followed by (+/-). For example, to enter -49:

HP 10bII+ Calculator Keystrokes		
Select	Display	Notes
49	49	
+/-	-49	Changes figure to a negative number.

## Clearing Entries

To clear the last entry in a calculation so you may enter a new (correct) number and continue with your calculation:

HP 10bII+ Calculator Keystrokes		
Select	Display	Notes
C	0.00	

To clear all the stored values in the calculator:

HP 10bII+ Calculator Keystrokes		
Select	Display	Notes
▼ C ALL	12 P_Yr	1 P_Yr or 2 P_Yr may appear depending on the time periods per year the calculator is currently set to.
	0.00	Display changes to 0.00.

### ! ATTENTION

Before performing a new calculation, ensure you clear all stored values. Any values stored in the calculator may cause you to get an error or an incorrect result for a calculation.

## Setting Time Periods Per Year

An important setting for financial calculations is the time periods per year setting. To check the current setting, select ▼ and C ALL. The calculator display shows the current setting for periods per year. The calculator comes preset at 12 periods per year, as it assumes calculations are done on a monthly basis. However, when explaining financial theory and practice, calculations generally use one period per year.



To change the calculator setting from 12 periods per year to one period per year:

HP 10bII+ Calculator Keystrokes		
Select	Display	Notes
1 ▼ P/YR	1.00	Sets periods per year to one.
▼ C ALL	1 P_Yr	To check your setting; display changes to 0.00 after a short time.

**! ATTENTION**

The HP 10bII+ calculator has a P/YR key and \*P/YR key. Be sure you are using the P/YR key when setting the number of time periods per year.

### Recalling Setting Values

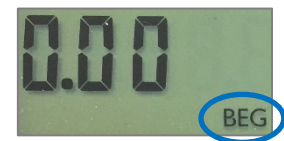
To retrieve the value of a setting that you entered previously, select RCL and the variable that you want to recall. For example:

HP 10bII+ Calculator Keystrokes		
Select	Display	Notes
RCL I/YR	Last value entered for interest per year	Displays 0.00 if no value was previously entered.
RCL N	Last value entered for the number of payments	Displays 0.00 if no value was previously entered.

### Setting the Beginning and End Modes

The HP 10bII+ has both beginning and end modes that tell the calculator whether payments are made at the beginning or the end of a time period. In most cases in the course, the calculations are performed in the end mode.

To set cash flows to the beginning of a time period or the end of a time period, select ▼ Beg/End. If the calculator is set to beginning mode, BEG is visible in the status line of the display. If the calculator is set to end mode, there is no indicator on the display.



**/ NOTE**

Ensure you switch the calculator back into end mode before continuing on with the tutorial.

**Using the Amortization Function**

Amortization is the process of dividing a payment into the amount that applies to interest and the amount that applies to principal. The AMORT key on the HP 10bII+ calculator allows you to calculate:

- The amount applied to interest in a range of payments
- The amount applied to principal in a range of payments
- The outstanding balance after a specified number of payments are made

To use the amortization function you will have to have just calculated a payment or you have stored the appropriate amortization values in I/YR, PV, FV, PMT, and P/YR.

**/ NOTE**

Because the calculator carries forward accuracy to the right of the decimal place to 12-digits regardless of the number of decimals set to be displayed, all calculations using the amortization function will begin with calculating the payment amount for this course.

For example, the following table illustrates how once the monthly payment amount of a loan for \$200,000 amortized over 30 years with an interest rate of 6.66% has been determined, it can be used to calculate the principal paid, interest paid, and the outstanding balance at the end of the first year.

**HP 10bII+ Calculator Keystrokes**

Select	Display	Notes
12 ▼ P/YR	12.00	Sets periods per year to 12.
6.66 I/YR	6.66	Interest rate.
200.000 PV	200,000.00	Loan amount. This number is positive as it represents a cash inflow.
360 N	360.00	The number of monthly payments over the amortization period (12 payments per year x 30 years = 360 monthly payments).
PMT	-1,285.25	Monthly loan payment.
▼ AMORT	1 – 12 AMORT PER	Payment period range (Months 1-12).

=	-2,168.38 AMORT PRIN	Principal paid during payment period range.
=	-13,254.62 AMORT INT	Interest paid during payment period range.
=	197,831.62 AMORT BAL	Outstanding balance at the end of Month 12.

It is possible to determine the principal paid, interest paid, and outstanding balance at any time during the amortization period by entering the desired payment period range. For example, if you wanted to know the principal paid, interest paid, and outstanding balance at the end of six years:

#### HP 10bII+ Calculator Keystrokes

Select	Display	Notes
6.66 I/YR	6.66	Interest rate.
200,000 PV	200,000.00	Loan amount. This number is positive as it represents a cash inflow.
360 N	360.00	The number of monthly payments over the amortization period (12 payments per year x 30 years = 360 monthly payments).
PMT	-1,285.25	Monthly loan payment.
61 INPUT	61.00	Starting month of desired payment period range (Month 61).
72	72_	Ending month of desired payment period range (Month 72).
▼ AMORT	61 – 72 AMORT PER	Payment period range (Months 61-72).
=	-3,022.43 AMORT PRIN	Principal paid during payment period range.
=	-12,400.57 AMORT INT	Interest paid during payment period range.
=	184,540.72 AMORT BAL	Outstanding balance at the end of Year 6.

An alternative to selecting a specific payment period range is to select ▼ AMORT until you get to the range you require.

#### HP 10bII+ Calculator Keystrokes

Select	Display	Notes
6.66 I/YR	6.66	Interest rate.

200,000 PV	200,000.00	Loan amount. This number is positive as it represents a cash inflow.
360 N	360.00	The number of monthly payments over the amortization period (12 payments per year x 30 years = 360 monthly payments).
PMT	-1,285.25	Monthly loan payment.
▼ AMORT	1- 12 AMORT PER	Payment period range (Months 1-12).
▼ AMORT	13 - 24 AMORT PER	Payment period range (Months 13-24).
▼ AMORT	25 - 36 AMORT PER	Payment period range (Months 25-36).
▼ AMORT	37 - 48 AMORT PER	Payment period range (Months 37-48).
▼ AMORT	49 - 60 AMORT PER	Payment period range (Months 49-60).
▼ AMORT	61 – 72 AMORT PER	Payment period range (Months 61-72).
=	-3,022.43 AMORT PRIN	Principal paid during payment period range.
=	-12,400.57 AMORT INT	Interest paid during payment period range.
=	184,540.72 AMORT BAL	Outstanding balance at the end of Year 6.

## Resetting the Calculator

If the HP 10bII+ calculator locks up or stops responding correctly it may require a reset.

### ! ATTENTION

Resetting the calculator erases the memory and restore the calculator's factory default settings. Document any critical data stored in the calculator before resetting it.

## HP 10bII+ Calculator Keystrokes

Select	Display	Notes
ON	0.00	Displays 0.00 or the last number in memory before it was turned OFF. Do not release the key.

N and FV                      0.00

While holding the ON key, select and hold the N and FV keys simultaneously.

Release all three keys    COPr HP 2010 then ALL CLEAR

C                                0.00

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