

New methods for distance learning

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A Blended Learning Approach to Engineering Education



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Talk Outline

- Blended Learning
- Engineering Modules tried
- Moodle VLE
- Streamed Video Lectures
- Student feedback
- Conclusions



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Blended Learning

- Blended Learning is learning which combines online and face-to-face approaches.
- The challenge is **getting the right blend**
- And the **ingredients** !



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Engineering Modules tried

- Analogue Electronics – 2nd year
- Signals & Systems – 3rd year
- Digital Signal Processing – 4th year



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Moodle VLE

- Previously worked with WebCT™ and Blackboard™
- MyVLE
- NUIM adopted Moodle in 2005



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The screenshot shows the Moodle VLE interface for a course titled 'Analogue Electronics: Op-Amp Circuits-GE210'. The user is logged in as 'Bob Lawlor'. The main content area displays a 'Topic outline' with the following items:

- Welcome to GE210 Analogue Electronics (Op-Amp circuits)
- GE210 Module Descriptor
- News forum
- Intro to Op-Amps - discussion forum
- Past exam papers
- 1 The last three lectures -- on video!** (Viewable with Microsoft Internet Explorer only)
 - Video Lecture 19 -- Square wave generator
 - Video Lecture 19 zipped for download
 - Video Lecture 20 -- Digital-to-analogue conversion
 - Video lecture 20 zipped for download
 - Video Lecture 21 -- Analogue-to-digital conversion
 - Video lecture 21 zipped for download
- 2 Lecture notes**
 - Lecture notes
- 3 Laboratories**
 - Lab 1 - Inverting amp, summing amp
 - Lab 2 - non-inverting amp, voltage follower

On the right side, there are sections for 'Latest News', 'Upcoming Events', 'Recent Activity', and 'My courses'.

Exam Support :: StudyPack - Microsoft Internet Explorer

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RevisionPack

eLesson

Video Lecture Presentation

Handouts

Handouts of the eLesson and Exam Model Answer

Audio Download

Download Audio of eLesson

RevisionPack Information

Select an option from the buttons on the left

Title
Analogue Electronics - Lecture 19

Description
This Lecture deals with:
- Square Wave Generator
- Appreciation
- Analysis


Numerical examples are also included.

Product Code: GE210 - 019

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Exam Support :: LiveLecture Player - Microsoft Internet Explorer

eLesson



Teacher: Gerald Brady

Paused Normal Speed Total Time: 4:23

Play Pause Stop 20Sec

Low High Stop 20Sec

Title Analogue Electronics - Lecture 19

Lecture 19 – Square-wave generator

Introduction

- All digital systems need at least one clock signal, usually in the form of a regular square-wave voltage at a set frequency.
- The square-wave generator (right) is a cheap, flexible, controllable way of doing the job.
- In this lecture we describe how it works, and we find a way to control the frequency of the square wave it produces.

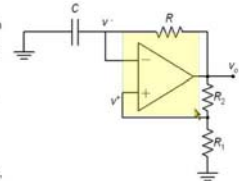



Figure 1. The square-wave oscillator

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Exam Support :: LiveLecture Player - Microsoft Internet Explorer

eLesson



Teacher: Gerald Brady

Paused Normal Speed Total Time: 25:18

Play Pause Stop 20Sec

Low High Stop 20Sec

Title Analogue Electronics - Lecture 19

Region 2: $t_1 < t < t_2$:

At $t=t_1$, v^- rises as far as v^+ , V_{sat} flips negative and C starts to discharge. v^- then slowly falls towards $-V_{sat}$. v^- in region 2 is given by (check this yourself)

$$v^-(t) = (v^-_{initial} + V_{sat})e^{-\frac{t-t_1}{RC}} - V_{sat}$$

Substituting for $v^-_{initial} = v^+$:

$$v^-(t) = \left(\frac{R_1}{R_1 + R_2} V_{sat} + V_{sat} \right) e^{-\frac{t-t_1}{RC}} - V_{sat}$$

$$= V_{sat} \left[\frac{2R_1 + R_2}{R_1 + R_2} e^{-\frac{t-t_1}{RC}} - 1 \right]$$

How to find t_2 ? Well, at $t=t_2$, $v^- = 0$, so we can say

$$V_{sat} \left[\frac{2R_1 + R_2}{R_1 + R_2} e^{-\frac{t_2-t_1}{RC}} - 1 \right] = 0$$

Turning this expression inside-out to find an expression for t_2 :

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CVS.SM.16.001.mp4


CVS Learning
Rapid Video Learning™

Workshop 2 - Linking Research to Teaching & Learning

The common belief that teaching and research are inextricably intertwined is an enduring myth (Hattie & Marsh, 1996)

Two types of Research:

- Frontier Research:**
 - Ground-breaking, Novel
- Practice Research:**
 - Accessing, Interpreting
 - Applying existing relevant info



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00:26:00

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Example videos

- Example with headshot
- Example without headshot
- Example with overlay headshot

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NUIJM moodle

Analogue Electronics:Op-Amp Circuits-GE210

moodle > GE210 [06-07] > Forums > Intro to Op-Amps - discussion forum

Update this Forum

Everyone can choose to be subscribed. Show/edit current subscriptions. Unsubscribe from this forum. Don't track unread messages.

Discussion	Started by	Replies	Unread	Last
question on the voltage follower	JUNGCHENG LU	3	0	Thu, 15 Feb 2007, 8:00
Op-Amps	LOKOLA MITWALI	2	0	Tue, 13 Feb 2007, 8:00
op amp	NTUMPA MAVANGA	3	0	Fri, 9 Feb 2007, 8:00
Question on op amp circuits?	ANTHONY DESMOND KEENAN	6	0	Thu, 8 Feb 2007, 8:00
GE210	JUNGCHENG LU	2	0	Thu, 8 Feb 2007, 8:00
Example in the notes of effect of finite gain	JUNGCHENG LU	2	0	Thu, 8 Feb 2007, 8:00
GE210-Op-Amp	MAIREAD LYONS	1	0	Wed, 7 Feb 2007, 8:00
GE210	JUNGCHENG LU	1	0	Mon, 5 Feb 2007, 8:00
Op-Amp question	ISA IMINOV	2	0	Mon, 5 Feb 2007, 8:00
op-Amps amplifier	OLUWASEUN OTTU	2	0	Fri, 2 Feb 2007, 8:00

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PBL Example Handout



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question on the voltage follower
by JUNGHENG LI - Tuesday, 13 February 2007, 05:41 PM
In a voltage follower, Does R_1 must be equal to infinite (when $R_2=0$)? If not, what affect on A_v , if R_1 =some value and $R_2=0$? What is the difference between a voltage follower (with R_1 = infinite and $R_2=0$) and a voltage follower (with R_1 =some value and $R_2=0$)?

Re: question on the voltage follower
by Bob Lawlor - Wednesday, 14 February 2007, 12:06 PM
Good Question!
Anyone want to have a go at answering it?
Bob

Re: question on the voltage follower
by COLIN RODGERS - Wednesday, 14 February 2007, 02:26 PM
Would the value of R_1 not become irrelevant as the gain equation shows that the voltage out = the voltage in, thus making it a buffer circuit, giving a gain of 1 regardless of resistances?

Re: question on the voltage follower
by Bob Lawlor - Thursday, 15 February 2007, 02:48 PM
Thanks Colin,
That's correct - the value of R_1 is irrelevant so it makes economic sense to leave it out.
Bob

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Student Feedback

- Positive
 - Easy to view
 - pleasantly surprised to be able to see slides live, and to print out notes
- Negative
 - students don't have broadband at their term addresses
 - Students suggested indexing
- Interesting 'feedback'!



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Conclusions

- Optimal blend depends on individual teaching style
- Full headshot version requires help to prepare & implies large files
- Voice plus slides easier to prepare and implies smaller files
- Efficiency benefit comes in subsequent deliveries of module



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There are really no models of e-learning *per se* – only e-enhancements of models of learning...
...A model of e-learning would need to demonstrate on what pedagogic principles the added value of the 'e' was operating.

JISC e-Learning Models Desk Study
Stage 2: Review of e-learning theories, frameworks and models, 2004
Authors: Terry Mayes & Sara de Freitas

JISC = Joint Information Systems Committee (www.jisc.ac.uk)



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Acknowledgements

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 - www.cvslearning.ie
 - www.examsupport.ie



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Questions

Thank You



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