

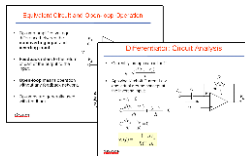
ME3000

Analog Electronics Courseware



Teaching slides

- Editable Microsoft® PowerPoint® slides
- Covers 45 hours of teaching



Training kit

- Analog electronics kit
- Lab sheets & model answers
- Problem-based assignments
- Covers 24 hours of labs



Instruments

- Power supply
- Function generator
- Oscilloscope
- Multimeter



Target university subject	Target year of study	Prerequisite(s)
Analog Electronics	1st or 2nd year undergraduate	None

The ME3000 serves as a ready-to-teach package in the areas of semiconductor fundamentals, circuit analysis, and electronic device applications. It consists of teaching slides, a training kit, and instruments (to be purchased separately).

Designed to impart knowledge in

- Semiconductor fundamentals
- Analog electronic devices
- Analog circuit analysis
- Typical applications of electronic devices
- Measurement instruments usage

Benefits of the ME3000 courseware

- The analog electronics kit consists of the Diode & Transistor and Op-Amp modules, which contains jumpers and discrete component holders for students to select and insert different components, allowing them to characterize the behavior of diodes, transistors, op-amps, active filters, and amplifiers.
- Unlike breadboards, the modules do not require loose parts to work, resulting in minimum parts and inventory management.
- The on-board circuits can be viewed easily, allowing students to understand how circuits are built and connected.
- Lab sheets are specially designed to allow students to gain exposure to basic instruments such as power supplies, function generators, oscilloscopes, and multimeters.
- You have the flexibility to configure your lab using conventional benchtop or PC-based modular instruments—the modular instruments save space and allow you to easily mix and match different instruments based on your lab requirement.



Teaching Slides

More than 500 editable Microsoft PowerPoint teaching slides, covering 45 hours of teaching for one full semester are provided. The slides cover the following topics:

- The P-N Junction & Semiconductor Diodes
- The Bipolar Junction Transistor
- DC Biasing
- Transistor Modeling
- Small-Signal Analysis
- Frequency Response of a BJT Amplifier
- Design of a Small-Signal BJT Amplifier
- Field-Effect Transistors Part I: Types and Characteristics
- Field-Effect Transistors Part II: Biasing
- Field-Effect Transistors Part III: Small-Signal Analysis
- Operational Amplifiers
- 555 Timer-based Multivibrators
- Oscillators
- Voltage Regulators



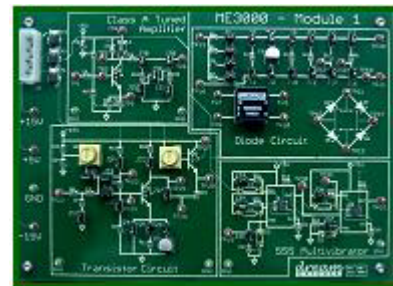
Training Kit

Analog electronics kit

The training kit hardware consists of the Diode & Transistor module and Op-Amp module.

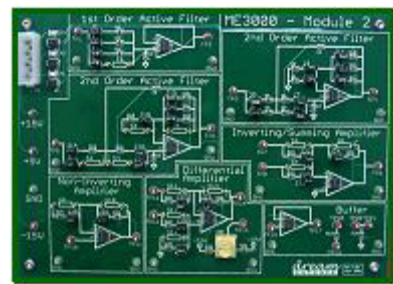
Diode & Transistor Module

- Diode circuit
- Transistor circuit
- Class A tuned amplifier
- 555 multivibrator



Op-Amp Module

- 1st order active filter
- 2nd order active filter
- Buffer
- Inverting/summing amplifier
- Non-inverting amplifier
- Differential amplifier



Accessories

The following accessories are provided with the training kit.

Item	Quantity
Power supply cable	1
Jumper cable with grabber clips	6
BNC(m)-to-grabber clip cable	1
Antistatic wrist strap	1



Lab sheets

The training kit includes 8 lab sheets in editable Microsoft Word format, which allow students to learn the characteristics and basic operation of analog devices such as diodes, transistors, op-amps, amplifiers, multivibrators, and active filters. Each lab requires 3 hours to complete. Model answers are provided with all lab sheets. The labs can use either conventional benchtop or PC-based modular instruments.

Lab Sheet	Required Instrument(s)		
	Option 1 Power Supply & Multimeter	Option 2 Power Supply, Function Generator, & Oscilloscope	Option 3 Power Supply, Function Generator, Multimeter, & Oscilloscope
Diode Characteristics	√		√
Rectifier Circuits		√	√
BJT Characteristics	√		√
DC Biasing			√
Practical Op-Amp Circuits			√
RF Class A Tuned Amplifiers			√
555 Multivibrator Circuits		√	√
Active Filters		√	√

Problem-based assignments

The problem-based assignments below allow students to enhance their problem-solving skills.

- Basic Signal Conditioning Using Op-Amp Circuits
- Low Pass Active Filter Design
- 555 Multivibrator Circuits



Instruments

The recommended instruments from Agilent Technologies, to be purchased separately, are listed below. You may choose between two families of basic instruments: benchtop or modular.



Benchtop



Modular

Instrument ^[1]	Benchtop Family ^[2]	Modular Family ^[2]
Power Supply	E3631A Triple Output DC Power Supply	E3631A ^[3] Triple Output DC Power Supply
Function Generator	33220A Function Generator	U2761A ^[4] USB Modular Function Generator
Oscilloscope	DSO1002A 60 MHz Oscilloscope	U2701A ^[4] USB Modular Oscilloscope
Multimeter	34405A 5½ Digit Multimeter	U1242A Handheld Digital Multimeter

[1] Refer to the Lab sheets section for the instrument selection.

[2] The courseware is designed to work with these instruments and software. Other models with equivalent performance may be used with alterations to the lab procedures.

[3] There is no modular power supply model, therefore the E3631A is used for both instrument families.

[4] Requires a PC with Windows® XP or Windows® Vista to control the instrument via USB.

Training Kit Hardware Specifications

	Diode & Transistor Module		Op-Amp Module	
	Min	Max	Min	Max
Electrical				
Voltage supply (+5 V)	4.5 V	5.5 V		
Voltage supply (+15 V)	13.5 V	16.5 V	13.5 V	16.5 V
Voltage supply (-15 V)			-16.5 V	-13.5 V
Current supply (+5 V)	7.0 mA	10.0 mA		
Current supply (+15 V)	1.0 mA	3.0 mA	6.0 mA	8.0 mA
Current supply (-15 V)			7.0 mA	20.0 mA
General				
EMC designed to			CISPR11:1990/EN55011:1991 IEC61010-1:1990+A1	
Dimensions (W x H x D)			230 mm x 65 mm x 180 mm (each unit)	
Weight			0.6 kg (each unit)	
Warranty			1 year	

Ordering Information

Description	Package	Product Number
Teaching Slides	1 user license	ME3000-100
Training Kit	1 set	ME3000-200
Teaching Slides + Training Kit	1 user license + 1 set	ME3000-300
Instruments	where applicable	Purchase separately from Agilent or its distributor

Training courses related to subject matter are available on request. Visit dreamcatcher.asia for details.

<p>For more information or enquiries:</p> <p>Website: dreamcatcher.asia/cw E-mail: cw.enquiry@dreamcatcher.asia</p> <p>Acehub Vista Sdn Bhd (785702-P) <i>A member of the DreamCatcher group</i> 10, Persiaran Mahsuri 1/2 Sunway Tunas, 11900 Bayan Lepas Malaysia</p>	<p>© 2009 Acehub Vista Sdn Bhd</p> <p>We reserve the right to change or alter the information in this material without prior notice. The information provided in this material is accurate as of the print date.</p> <p>Microsoft and Windows are trademarks of Microsoft Corporation in the United States and/or other countries. All other copyrights and trademarks belong to their respective owners.</p> <p>Printed on 01 September 2009</p>
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