

Electronic and Electrical Engineering

Nanoscale Processing and Characterisation for Advanced Devices (ELEC0031)

Description

Nanotechnology refers to the world as it works on the nanometre scale from about one nanometre to a few hundred nanometres. The synthesis and control of nanomaterials can involve 'bottom up' strategies of self assembly starting with the smallest possible entities, such as atoms and molecules, much in the same way as synthesis is conducted in natural biological systems. Alternatively more conventional 'top-down' strategies can be extended to the Nanoscale. Students will learn the merit of both approaches in terms of the fabrication of advanced nanoscale electronic devices. In addition, an insight into the characterization methods that are required when devices move to this dimensional scale will be achieved.

This module will introduce the basis of nanoscale processing and the fabrication of nanostructures for advanced device applications, and help students understand the techniques for the characterisation of device structures on the nanoscale.

On completion of this course, students should be able to:

- Understand advanced Si processing methodology and the impact of scaling and Moore's law
- Be able to distinguish between different patterning techniques for the nanoscale and understand the strengths and weaknesses of each
- Describe the techniques of MBE and CVD and the way these are realised for nano-device fabrication
- Have detailed insight into the key issues that arise when electrical characterisation moves to the nanoscale
- To appreciate the methodology used for nano-scale structural characterisation

Key information

Year	2019/20
Credit value	15 (150 study hours)
Delivery	UG L6, Campus-based
Reading List	View on UCL website
Tutor	Prof Huiyun Liu
Term	Terms 1 and 2
Timetable	View on UCL website

Assessment

■ Written examination (main exam period): 100%

Find out more

For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk



Electronic and Electrical Engineering

Nanoscale Processing and Characterisation for Advanced Devices (ELEC0031)

Description

Nanotechnology refers to the world as it works on the nanometre scale from about one nanometre to a few hundred nanometres. The synthesis and control of nanomaterials can involve 'bottom up' strategies of self assembly starting with the smallest possible entities, such as atoms and molecules, much in the same way as synthesis is conducted in natural biological systems. Alternatively more conventional 'top-down' strategies can be extended to the Nanoscale. Students will learn the merit of both approaches in terms of the fabrication of advanced nanoscale electronic devices. In addition, an insight into the characterization methods that are required when devices move to this dimensional scale will be achieved.

This module will introduce the basis of nanoscale processing and the fabrication of nanostructures for advanced device applications, and help students understand the techniques for the characterisation of device structures on the nanoscale.

On completion of this course, students should be able to:

- Understand advanced Si processing methodology and the impact of scaling and Moore's law
- Be able to distinguish between different patterning techniques for the nanoscale and understand the strengths and weaknesses of each
- Describe the techniques of MBE and CVD and the way these are realised for nano-device fabrication
- Have detailed insight into the key issues that arise when electrical characterisation moves to the nanoscale
- To appreciate the methodology used for nano-scale structural characterisation

Key information

Year	2019/20
Credit value	15 (150 study hours)
Delivery	PGT L7, Campus-based
Reading List	View on UCL website
Tutor	Prof Huiyun Liu
Term	Terms 1 and 2
Timetable	View on UCL website

Assessment



■ Written examination (main exam period): 100%

Find out more

For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk



Electronic and Electrical Engineering

Nanoscale Processing and Characterisation for Advanced Devices (ELEC0031)

Description

Nanotechnology refers to the world as it works on the nanometre scale from about one nanometre to a few hundred nanometres. The synthesis and control of nanomaterials can involve 'bottom up' strategies of self assembly starting with the smallest possible entities, such as atoms and molecules, much in the same way as synthesis is conducted in natural biological systems. Alternatively more conventional 'top-down' strategies can be extended to the Nanoscale. Students will learn the merit of both approaches in terms of the fabrication of advanced nanoscale electronic devices. In addition, an insight into the characterization methods that are required when devices move to this dimensional scale will be achieved.

This module will introduce the basis of nanoscale processing and the fabrication of nanostructures for advanced device applications, and help students understand the techniques for the characterisation of device structures on the nanoscale.

On completion of this course, students should be able to:

- Understand advanced Si processing methodology and the impact of scaling and Moore's law
- Be able to distinguish between different patterning techniques for the nanoscale and understand the strengths and weaknesses of each
- Describe the techniques of MBE and CVD and the way these are realised for nano-device fabrication
- Have detailed insight into the key issues that arise when electrical characterisation moves to the nanoscale
- To appreciate the methodology used for nano-scale structural characterisation

Key information

Year	2019/20
Credit value	15 (150 study hours)
Delivery	UGM L7, Campus-based
Reading List	View on UCL website
Tutor	Prof Huiyun Liu
Term	Terms 1 and 2
Timetable	View on UCL website

Assessment



■ Written examination (main exam period): 100%

Find out more

For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk