THE UNIVERSITY OF MANCHESTER
Programme Unit Specification

1. GENERAL INFORMATION

Title	Polymer Technology
Unit code	MATS-20292
Credit rating	10
Level	3 (Year-2)
Semester(s)	2
Pre-requisite units	MATS-10232 Physics for Materials Technology
Co-requisite units	None
School responsible	Materials (Textiles & Paper Group)
Member of staff responsible	Dr MA Wilding
Other staff involved	None

2. AIMS

The programme unit aims to provide knowledge and understanding of the structure and physical properties of polymers, which form the fundamental component of the vast majority of textile materials. It further acts as preparation for the "Fibre Science" unit (Level F).

3. BRIEF DESCRIPTION OF THE UNIT

Drawing on concepts developed in the Level-1 unit "Physics for Textiles", this unit delivers a range of theoretical and practical topics appropriate to a study of the structure and physical behaviour of polymeric materials. Students are familiarised with a range of topics which form the basis for a study of polymeric materials such as textile fibres. Because the class size is generally small, it is possible to present the lectures in a tutorial style, in which informal discussion is strongly encouraged. Examples are incorporated from research and other sources.

The unit is divided into two main parts:

1. General Nature of Polymers

- Structure and dimensions of polymer molecules
- Molten polymers and origins of chain flexibility
- Crystallisation of polymers
- Bulk morphology of crystalline polymers
- Glassy/rubbery states and Tg.

2. Mechanical Properties of Solid Polymers

- Elasticity of glassy and semi-crystalline polymers
- Rubber-like elasticity in polymers & its origins
- Time effects in polymer properties.

4. INTENDED LEARNING OUTCOMES *(include unit-specific and contribution to programme)*

Category of outcome	*Students should be able to demonstrate:*
Knowledge and understanding	• knowledge and understanding of the distinctive nature, fundamental structure and physical properties of linear polymers;
Intellectual skills	• the ability to analyse the relationships between the microstructure and physical properties of polymeric materials; • the ability to translate their knowledge and understanding of polymer structure and properties to real-world practical problems in the development, performance and processing of industrial materials such as textiles;
Practical skills	• use of sources of information (books, library, internet, etc); • use of study aids (eg computers & calculators);
Transferable skills and personal qualities	• written communication skills; • the ability to employ mathematical methods in solving problems in polymer science.

5. LEARNING AND TEACHING PROCESSES (*methods of delivery*)

Nominally 24 hours of lectures. This includes ca. 4 hours of revision tutorials.

6. ASSESSMENT

Assessment task	Length	Weighting within unit (if relevant)
Written examination paper	Two hours; answer 3Q from 5	100%

Date of current version	24th August, 2009