



**University of  
Sunderland**

Dodou, Kalliopi (2020) Formulation, Manufacture and Material Science skills for Cosmetic, Personal care and Fragrance products. [Teaching Resource]

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## Module Descriptor

Module Summary Information	
<b>A</b>	<b>Module Title</b> Formulation, Manufacture and Material Science skills for Cosmetic, Personal care and Fragrance products
<b>B</b>	<b>Module Code:</b> CSCM02
<b>C</b>	<b>Credits:</b> 30 credits
<b>D</b>	<b>Level:</b> 7
<b>E</b>	<b>Pre-Requisites:</b> None
<b>F</b>	<b>Co-Requisites:</b> None
<b>G</b>	<b>Faculty:</b> Health Sciences and Wellbeing
<b>H</b>	<b>Module Leader:</b> Dr Kalliopi Dodou
<b>I</b>	<b>Other Teaching Staff:</b> tbc
<b>J</b>	<b>HECoS Code:</b>

<b>K</b>	<b>Content Synopsis- Web version</b> Develop critical understanding of the formulation principles for skincare and haircare cosmetic and personal care products, decorative products and fragrances. Gain analytical and evaluative skills of the manufacturing principles of cosmetics, including lab-scale and industrial-scale manufacture, types of equipment and critical manufacturing parameters using appropriate examples, the techniques involved in Quality Control testing, material characterization and sensorial evaluation of cosmetic formulations. Display the ability to make informed decisions on New Product Development (NPD) tasks, from raw material selection to critical evaluation of formulation scale-up and manufacturing processes, packaging and marketing.
<b>L</b>	<b>Module Content</b> The learning outcomes will be developed through the following evolving module themes:  <b>Formulation principles for skincare, haircare, decorative and fragrance products</b> You will gain understanding and demonstrate expertise in the formulation of different types of cosmetic, fragrance and personal care products, including the application of standard industrial protocols and documentation procedures, such as the Cosmetic Product Safety Protocol (CPSR). The factors affecting formulation stability will be explained and you will demonstrate the ability to make informed decisions on the design of a stable cosmetic product in terms of selection of appropriate raw materials and formulation processes.  <b>Manufacturing principles for skincare, haircare, decorative and fragrance products</b> You will gain understanding of Good Laboratory Practice (GLP) and Good Manufacturing Practice (GMP), the importance and processes of quality control, and the use of statistics in Quality Control data analysis. You will demonstrate understanding of a range of material characterization techniques (eg HPLC, GC,

	<p>rheology, DSC, FTIR, NMR, SEM etc) and sensorial evaluation techniques (objective and subjective), and how they can be tailored in the overall claim substantiation testing for a cosmetic, personal care or fragrance product. You will gain understanding in the critical manufacturing parameters, how they affect the quality of the finished product and how they can be monitored via in-process and final-product quality control tests. You will demonstrate the ability to make informed decisions on the manufacturing process, based on data collected from quality control tests and you will develop your problem-solving and troubleshooting skills. In addition, the challenges involved with the scale-up will be explained.</p> <p>The two themes will merge in the New Product Development (NPD) task, which will enable you to design independently all stages of a new product's lifecycle.</p> <p>Transferable skills:</p> <ul style="list-style-type: none"> <li>• Team work</li> <li>• Problem-solving</li> <li>• Critical analysis of data</li> <li>• Independent learning</li> </ul>
<b>M</b>	<b>Module Learning Outcomes</b>
	By the end of this module successful students will be able to do the following:
<b>1</b>	Display mastery of the formulation principles for skincare and haircare cosmetic and personal care products, decorative products and fragrances.
<b>2</b>	Display mastery of the manufacturing principles of cosmetics, including lab-scale and industrial-scale manufacture, types of equipment and critical manufacturing parameters, using appropriate examples.
<b>3</b>	Demonstrate expertise in the techniques involved in Quality Control testing, material characterization and sensorial evaluation of cosmetic formulations.
<b>4</b>	Display the ability to make informed decisions on New Product Development (NPD) tasks, from raw material selection to critical evaluation of formulation scale-up and manufacturing processes, packaging and marketing.

<b>N</b>	<b>Teaching and Learning Methods</b>																								
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<b>O</b>	<b>Assessment Methods</b>
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#	Title	Exam Length or Word length	Central or Local Exam	%	Summary	Module Mark
1	Analysis and evidence-based discussion of selected lab data.	3000 word	-	40	Individual submission. Assesses learning outcomes 1 and 3. Word limit for guidance only.	*
2	Problem-based learning (PBL) group presentation	30 min	-	30	Group ppt presentation on an NPD topic will assess learning outcome 4.	
3	Problem-based learning (PBL) group presentation	30 min	-	30	Group ppt presentation on a manufacturing troubleshooting topic will assess learning outcome 2	*
Overall Mark				100		**
Are there Programme Specific regulations that are applicable to this module?						Yes/No
If Yes please give details:						
Are programme Specific regulations applicable on every programme that the module is delivered on						Yes/No
If No please give details:						
<a href="https://my.sunderland.ac.uk/display/AQH/Academic+Regulations">https://my.sunderland.ac.uk/display/AQH/Academic+Regulations</a>						

P	Reading List
	Adejokun D. and <b>Dodou K.</b> (2020) Quantitative Sensory Interpretation of Rheological Parameters of a Cream Formulation. <i>Cosmetics</i> , 7 (1), 2-13.
	Baki G, Alexander KS (2015) Introduction to cosmetic formulation and technology. Wiley: Hoboken, New Jersey.
	<b>Dodou K</b> (2011) <i>The use of adhesive films in transdermal and mucoadhesive dosage forms</i> . In: Adhesive Properties in Nanomaterials, Composites and Films. Nova Science Publishers, New York, pp. 83-93.
	Ho KY, <b>Dodou K.</b> (2007) Rheological studies on pressure sensitive silicone adhesives and drug-in-adhesive layers as a means to characterise adhesive performance. <i>International Journal of Pharmaceutics</i> 333(1-2), 24-33.
	Loh XJ (2016) Polymers for personal care products and cosmetics. The Royal Society of Chemistry: London
	Paye M, Barel AO, Maibach HI. (2014) Handbook of cosmetic science and technology. Taylor & Francis: Boca Raton.
	Rosen MR. (2015) Harry's Cosmeticology 9th Edition Volume Three. Chemical Publishing Company, Incorporated: New York.

	Schmitt WH, Williams DF. (2012) Chemistry and technology of the cosmetics and toiletries industry. Springer: Dordrecht.
	Tadros TF. (2016) Formulations: in cosmetic and personal care. De Gruyter: Berlin, Boston.

<b>Q</b>	<b>Programmes using the module as Core/Option:</b>
i	MSc Cosmetic Science (core)
ii	
iii	

<b>R</b>	<b>Module Delivery</b>
i	<b>On-Campus Yes/No</b>
ii	<b>Off-Campus Yes/No</b>
iii	<b>Distance Learning Yes/No</b>
iv	<b>Apprenticeship Yes/No</b>
v	<b>Available for incoming Study Abroad students Yes/No</b>
vi	<b>Professional Accreditation: Yes/ No</b> <i>(If yes, by whom and what conditions if any are specific to the module?)</i>

### S. Version Control

Module Descriptors are checked annually and updated when changes are made to the Module.

Version No		Date	Details of change	Author
V1	Document created	19/06/2020	New module	Dr Kalliopi Dodou
V2	Document changed			