



Example study checklist and assessment questions:
Certificate in Advanced Cosmetic Science

| Pace yourself! Set a due date of 2 weeks on each unit if studying 10-15hrs/wk or adjust accordingly | Tick when each time completed | Item/Unit |
|---|-------------------------------|--|
| | | Evaluate the functions of ingredients in personal care products |
| | | Read 1 st Chapter – Evaluate the functions of ingredients in personal care products – <i>access dropbox Evaluate functions folder to find the text so you can start studying straight away while you wait for your study materials to arrive!</i> |
| | | Watch Evaluate Functions Lecture and complete all lecture activities – <i>refer to dropbox for required lecture activity information sheets in the Evaluate functions folder.</i> |
| | | Watch Evaluate Functions lecture video (<i>in your on-line lecture system</i>). |
| | | Re-read text in relevant sections and ensure all text activities are completed; you may also choose to re-watch the lecture/video at this point (optional) |
| | | Watch on-line Tutorial |
| | | Complete all Section 1 questions of the Assessment |
| <i>Only continue to the next unit once you have completed all items in order</i> | | |

Some Example Assessment Questions:

1.4 Complete the tables for each product – use information provided in dropbox and processing information provided in the text to answer this question.

| Lamesoft PO65 | | |
|----------------------------|----------------------------|------------------------------------|
| Starting Material/s | Processing involved | Natural or synthetic status |
| | | |
| | | |
| Incroquat Behenyl | | |
| Starting Material/s | Processing involved | Natural or synthetic status |
| | | |
| | | |



1.5 How much of each component of each material would be present if it were used at 5% in a finished product?

| Lamesoft PO65 | | |
|----------------------|-----------------------|---|
| Component | % present in material | % present when used at 5% in a finished product |
| | | |
| | | |
| | | |

| Incroquat Behenyl | | |
|--------------------------|-----------------------|---|
| Component | % present in material | % present when used at 5% in a finished product |
| | | |
| | | |
| | | |



| Pace yourself! Set a due date of 2 weeks on each unit if studying 10-15hrs/wk or adjust accordingly | Tick when each time completed | Item/Unit |
|---|-------------------------------|---|
| | | Select appropriate preservatives in personal care formulations |
| | | Read Chapter – Select appropriate preservatives in personal care formulations |
| | | Watch Preservative lectures 1 & 2 and complete all lecture activities – <i>make sure you access the Preservative tables in dropbox to follow us through the Worked Example.</i> |
| | | Re-read text in relevant sections and ensure all text activities are completed; you may also choose to re-watch the lectures at this point (optional) |
| | | Watch on-line Tutorial for the Assessment |
| | | Complete all Section 2 questions of the Assessment |
| Only continue to the next unit once you have completed all items in order | | |

Some Example Assessment Questions

2.1 Identify and describe the two main mechanisms of preservative activity.

2.4 Describe the process of Preservative Efficacy (Challenge) Testing. In your answer, identify when you would use this testing, how it is performed, and what you would need results to show in order to prove efficacy.

2.6 Complete the following table: (*access dropbox for preservative tables*)

| Product | Preservative/blend you would use (trade name/s) | pH/temperature limits | Amount (%) to use | EU limit |
|---|---|-----------------------|-------------------|----------|
| Face mask product in jar (pH = 7) | | | | |
| Hair conditioner (pH = 4) | | | | |
| Shampoo (SLS, PEG, propylene glycol and paraben free) (pH = 6) | | | | |

| Pace yourself! Set a due date of 2-3 weeks | Tick when each time completed | Item/Unit |
|--|-------------------------------|-----------|
|--|-------------------------------|-----------|



| on each unit if studying 10-15hrs/wk or adjust accordingly | | Select appropriate gums & thickeners |
|--|--|---|
| | | Read Chapter – Select appropriate gums & thickeners. <i>Note: Activity brochures and raw material brochures are provided in dropbox gums folder.</i> |
| | | Watch Select appropriate gums lectures 1 & 2 and complete all lecture activities |
| | | Watch Gums video in on-line lectures – this video is crucial – it shows how to hydrate different gums in the lab. |
| | | Watch Select appropriate gums lecture 3 and complete all lecture activities |
| | | Re-read text in relevant sections and ensure all text activities are completed; you may also choose to re-watch the lectures/video at this point (optional) |
| | | View the YouTube video watching me make a simple gel: https://youtu.be/AkBXRf5Ynow |
| | | Prepare samples from Practical Activity Workbook relevant to the gums unit. <i>Note: Practical Activity Workbook is provided in Module 2 Dropbox folder.</i> |
| | | Review ingredient brochures in dropbox and highlight materials in text; you may also explore the advanced database, 'Prospector'. <ul style="list-style-type: none"> • Prospector Registration information is provided in Dropbox Module 2 folder. • To build your fundamental gum/thickener 'library of materials' focus on the materials in the text, dropbox, and the gum/thickener usage guide in dropbox, especially the different methods required! |
| | | Watch on-line Tutorial |
| | | Complete all Section 3 questions of the Assessment |
| Only continue to the next unit once you have completed all items in order | | |



Some Example Assessment Questions

3.4 Complete the following table for water based gums/thickeners

| Gum/thickener | Natural/synthetic status | Products best used for | Processing required as part of finished product formulation |
|---------------------------------------|--------------------------|------------------------|---|
| Xanthan | | | |
| Bentonite | | | |
| Hydroxyethylcellulose | | | |
| Guar hydroxypropyl trimonium chloride | | | |
| Carbopol Ultrez 21 | | | |
| PVP | | | |

3.5 Complete the following table for oil based thickeners.

| Gum/thickener | Natural/synthetic status | Products best used for | Processing required as part of finished product formulation |
|--------------------------|--------------------------|------------------------|---|
| Polyethylene | | | |
| Stearalkonium bentonite | | | |
| Trihydroxystearin | | | |
| Silica dimethyl silylate | | | |

3.6 Conduct searches into the various thickeners available as in your text, dropbox or Propector. Provide one example of a suitable **thickener** per product by completing the table below.



| Product | Trade name and/or INCI | Natural/ synthetic status | Reason for choosing | % to use | Processing method in final formulation |
|--|------------------------------|---------------------------------|---------------------|-------------|--|
| Hair conditioner (a cationic product) | | | | | |
| Budget body lotion (a water based emulsion) | | | | | |
| Liquid foundation (an oil based emulsion) | | | | | |
| Foaming face wash (an anionic product) | | | | | |



| Pace yourself! Set a due date of 2-3 weeks on each unit if studying 10-15hrs/wk or adjust accordingly | Tick when each time completed | Item/Unit Select appropriate lipids |
|---|-------------------------------|--|
| | | Read 2 nd Chapter – Select appropriate lipids. <i>Note: Activity brochures and raw material brochures are provided in dropbox lipids folder.</i> |
| | | Watch Select appropriate lipids lectures 1 & 2 and complete all lecture activities |
| | | Re-read text in relevant sections and ensure all text activities are completed; you may also choose to re-watch the lectures at this point (optional) |
| | | Prepare samples from Practical Activity Workbook relevant to the lipids unit. <i>Note: Practical Activity Workbook is provided in Module 2 Dropbox folder.</i> |
| | | Review ingredient brochures in dropbox and highlight materials in text; you may also explore the advanced database, 'Prospector' and conduct internet searches as guided in the learning materials. <ul style="list-style-type: none">• Prospector Registration information is provided in Dropbox Module 2 folder.• To build your fundamental lipid 'library of materials' focus on the materials in the text and dropbox, and the lipid usage guide in dropbox, especially the different inputs for different product types provided. |
| | | Watch on-line Tutorial |
| | | Complete all Section 4 questions of the Assessment |
| <i>Only continue to the next unit once you have completed all items in order</i> | | |



Some Example Assessment Questions

4.1 Describe the following processing methods used to obtain derivatives of natural lipids:

- a. esterification
- b. ethoxylation

4.4 Identify and describe the performance properties of silicones, and how they differ by molecular weight.

4.5 Conduct searches into the various natural lipids available and complete the table below using one ingredient in each category as an example.

| | INCI name | Natural/ synthetic status | Best suited for (product type) | % to use |
|------------------|-----------|------------------------------|-----------------------------------|----------|
| Vegetable oil | | | | |
| Vegetable butter | | | | |
| Exotic butter | | | | |
| Plant wax | | | | |

4.6 Conduct searches into the various derivatives of lipids available and complete the table below using one ingredient in each category as an example.

| | Trade name and/or INCI | Natural/ synthetic status | Best suited for (product type) | % to use |
|---------------------------|------------------------|---------------------------------|-----------------------------------|----------|
| Fatty acid | | | | |
| Fatty alcohol | | | | |
| Fatty acid ester | | | | |
| Ethoxylated derivative | | | | |



4.8 Conduct searches into the various silicones available and complete the table below using one ingredient in each category as an example.

| | Trade name and/or INCI | Best suited for (product type) | % to use |
|--|------------------------|--------------------------------|----------|
| Dimethicone | | | |
| Dimethicone/ Vinylmethicone crosspolymer (silicone elastomer) | | | |
| Silicone polyether (copolyols/PEGs/PPGs) | | | |

4.9 For each of the following product types, provide an example of **two** lipids you would use in each product by completing the following table.

| | Trade name and/or INCI | Natural/ synthetic status | Reason for choosing | % to use |
|--|------------------------|---------------------------------|---------------------|----------|
| Natural face cream (medium viscosity o/w emulsion) | | | | |
| | | | | |
| Budget body butter (highly viscous o/w emulsion) | | | | |
| | | | | |
| Premium conditioner | | | | |
| | | | | |
| Non greasy night cream (viscous w/o emulsion) | | | | |
| | | | | |



| Pace yourself! Set your due dates | Tick when each time completed | Item/Unit Emulsifiers & Surfactants |
|-----------------------------------|-------------------------------|---|
| | | Read Chapter 9: Emulsifier selection. <i>Note: brochures to complete activities can be found in Dropbox in the Colloids folder.</i> |
| | | Watch Apply colloid science lectures 1 & 2 and complete all lecture activities. |
| | | Re-read text in relevant sections and ensure all text activities are completed; you may also choose to re-watch the lectures at this point (optional) |
| | | View the YouTube videos watching me make various emulsions (<i>cut and paste the following YouTube links into your browser</i>): <ul style="list-style-type: none"> • How to make a basic cream: https://youtu.be/OSIdbwK_FYU • How to make a conditioner: https://youtu.be/JobkDBh2Qmk |
| | | Prepare samples from Practical Activity section (Appendix A of Book 2). |
| | | Review ingredient brochures in dropbox; you may also explore the advanced database, 'Prospector' and conduct internet searches as guided in the learning materials. <ul style="list-style-type: none"> • Prospector Registration information is provided in Dropbox. • To build your fundamental emulsifier 'library of materials' focus on the materials in dropbox and practice, practice, practice selection using the worked examples in the text as a guide. |
| | | Read Chapter 10: Surfactant Selection. |
| | | Watch Apply surface science lectures 1 & 2 and complete all lecture activities. |
| | | Re-read text in relevant sections and ensure all text activities are completed; you may also choose to re-watch the lectures at this point (optional) |
| | | View the YouTube videos watching me make surfactant products (cut and paste the following YouTube links into your browser): <ul style="list-style-type: none"> • How to make a mist and a gel: https://youtu.be/AkBXRf5Ynow • How to make a basic surfactant sample: https://youtu.be/vkomXhthJWA • How to make sulphate free hand wash: https://youtu.be/YA1V3qnmM9M |
| | | Prepare samples from Practical Activity section (Appendix A of Book2). |



| | | |
|---|--|---|
| | | <p>Review ingredient brochures in dropbox; you may also explore the advanced database, 'Prospector' and conduct internet searches as guided in the learning materials.</p> <ul style="list-style-type: none"> • Prospector Registration information is provided in Dropbox. • To build your fundamental surfactant 'library of materials' focus on the materials and Surfactant usage guide in dropbox and practice, practice, practice selection using the worked examples in the text as a guide. |
| <i>Only continue to the next unit once you have completed all items in order</i> | | |
| | | Read Chapter 11 – Basic Skin & Hair Physiology |
| | | Watch Develop a product from a product development brief lectures 1 & 2 and complete all lecture activities |
| | | Watch the Develop a product from a product development brief tutorial videos 1 and 2 in on-line lecture system |
| | | Re-read text in relevant sections and ensure all text activities are completed; you may also choose to re-watch the lectures at this point (optional) Go through worked examples we have provided to follow how formulas are put together. |
| | | Watch Formulating Sunscreens workshop (in your on-line lecture system). <i>Additional information, lectures & brochures in Dropbox Sunscreens & Cosmeceutical folder.</i> |
| | | Watch Formulating Cosmeceuticals workshop (in your on-line lecture system). <i>Additional information, lectures & brochures in Dropbox Sunscreens & Cosmeceutical folder.</i> |
| <i>Only continue to the next unit once you have completed all items in order</i> | | |
| | | Prepare samples of Dry Skin Cream and Basic Body Wash from Appendix B – use materials in your practical activity kit |
| | | Prepare product samples from the Formulation Extension Exercise booklet – you will need to source extra raw materials to complete these exercises and expand your knowledge of materials (<i>this booklet is in dropbox</i>) |
| | | Prepare formulation and method of manufacture for questions 5.1 to 5.6 of the Assessment (samples not required) - use the brochures in Dropbox to select materials for your formulas (especially emulsifiers and surfactants) + refer to Gums unit for methods/input rates + use preservative tables + brochures/lipids unit for inputs . Questions can be found on the next page. |
| <i>Only continue to the next unit once you have completed all items in order</i> | | |



Some Example Assessment Questions

Using the Formulation and Method template following this question, prepare formulas for 1 of each of the following products (i.e. you will need to submit 6 formulas as part of your assessment on this question):

- 5.1 A face or body lotion or cream
- 5.2 A face, hair or body foaming cleanser
- 5.3 A hair conditioning product (spray in, leave in or wash off)
- 5.4 A skin whitening product
- 5.5 A skin tanning product
- 5.6 An SPF30+ (or higher) sunscreen product

In your answers, make sure:

- your formulation is laid out using phase information like you have seen in the written learning materials
- your formulation contains trade names or material descriptors like you have learnt throughout the written learning materials so that it is clear what material you are using
- you specify if low or high shear is required when mixing materials
- you specify the temperature required if heating and/or cooling is required as part of the method of manufacture
- to double check your method suits the materials you have selected

that the final product pH suits the ingredients you have used and the type of product you have created.



| Pace yourself! Set a due date of 2 weeks on each unit if studying 10-15hrs/wk or adjust accordingly | Tick when each time completed | Item/Unit Apply microbiology techniques for product safety |
|---|-------------------------------|---|
| | | Read Chapter – Apply microbiology techniques for product safety |
| | | Watch Microbiology lectures 1, 2 and the lecture video (in your on-line lecture system), and complete all lecture activities |
| | | Re-read text in relevant sections and ensure all text activities are completed; you may also choose to re-watch the lectures at this point (optional) |
| | | Watch on-line Tutorial for the Assessment |
| | | Complete all Section 6 questions of the Assessment |
| <i>Only continue to the next unit once you have completed all items in order</i> | | |

Some Example Assessment Questions

6.2 Complete the following table:

| Org. | Product Type | Microbial Limits |
|-------------|---|-------------------------|
| TGA | Application on skin | |
| EU | Eye area, mucous membranes & children <3yrs | |
| EU | Other products | |
| TGA/EU | Raw materials | |

6.3 How would you sample raw materials and finished products? Include details of the equipment, types of agar and methods you would use.



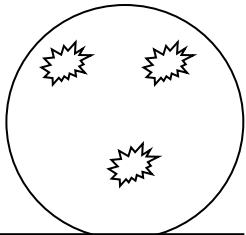
6.9 Provide 'ideal' systems to reduce microbial introduction in respect of:

6.9.1 the water system

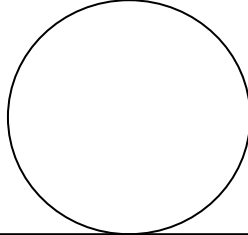
6.9.2 the air system

6.9.3 a sanitising system for equipment

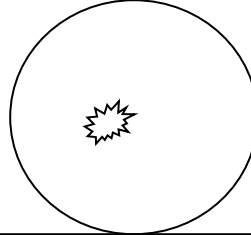
6.10 Imagine you are in charge of testing Quality of finished product. These are the results from the last batch of product made, and were consistent for all samples taken from finished product.



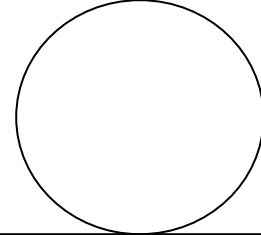
Tryptic soy agar



Sabouraud Dextrose Agar



Cetrimide Agar



Mannitol Salt Agar

6.10.1 Interpret the results – what would be the cfu count?

6.10.2 Provide steps of the investigation you would conduct to investigate the cause.

6.10.3 What should you do with this batch?



| Pace yourself! Set a due date of 2-3 weeks on each unit if studying 10-15hrs/wk or adjust accordingly | Tick when each time completed | Item/Unit Develop stable product formulations |
|---|-------------------------------|---|
| | | Read Chapter – Develop stable product formulations. |
| | | Watch Develop stable product formulations lectures 1 & 2 and complete all lecture activities. |
| | | Re-read text in relevant sections and ensure all text activities are completed; you may also choose to re-watch the lectures at this point (optional) |
| | | Watch on-line Tutorial |
| | | Complete all Section 7 questions of the Assessment |
| <i>Only continue to the next unit once you have completed all items in order</i> | | |

Some Example Assessment Questions

7.2 Describe when and why you would perform stability testing throughout the development of a product from concept through to product launch. In your answer, provide examples of the types of stability testing which may be best to perform at each stage.

7.3 Discuss the following considerations and how they may affect product stability:

- 7.3.1 climate in which the product is being sold
- 7.3.2 changing suppliers of raw materials
- 7.3.3 changing manufacturing equipment

7.4 Using the stability templates following this question, prepare real time and accelerated stability testing schedules for EACH of the following products:

7.4.1 a moisturiser to be stored at 30°C with ideal specifications:

- glossy white medium viscosity cream with characteristic coconut aroma
- pH: 5.5
- specific gravity: 0.85
- viscosity: 40,000 cps

In your answer include the types of tests you would perform and why.

7.6 Below is an example body lotion. This lotion has shown signs of separation, changes in fragrance and colouration and viscosity after 6 months. The product is packed in a clear plastic bottle with flip top cap.



Suggest ways to improve the stability of this product and provide reasons why you have made those suggestions.

Example body lotion

| PHASE | ADDED %w/w | RAW MATERIALS | FUNCTION |
|-------|---------------|-------------------------------|------------------------------|
| A | To 100 | Purified water | Solvent |
| A | 5.0 | Glycerin | Humectant/solvent |
| B | 4.0 | Cetearyl alcohol, cetareth-20 | Emulsifier blend |
| B | 0.5 | Stearic acid | Emulsifier |
| B | 9.0 | Grapeseed oil | Emollient |
| B | 2.0 | Almond oil | Emollient |
| B | 2.0 | Shea butter | Emollient |
| C | 0.5 | Calendula extract | Skin feel/advertising claims |
| C | 0.5 | Chamomile extract | Skin feel/advertising claims |
| D | 0.2 | Germall plus | Preservative |
| D | 0.5 | Vanilla essential oil | Fragrance |
| E | q.s | Citric acid | pH adjustment |

METHOD

1. Combine ingredients in phase A and heat to 65 - 70°C.
2. Combine ingredients in phase B and heat to 65°C.
3. Add phase B to phase A and stir. Emulsify and stir while cooling.
4. When cooled below 30°C add ingredients from phase C and D; stir under low shear until mixed thoroughly.

Adjust pH to 5.5 – 5.8.