LONDON SOUTH BANK UNIVERSITY

SAFE FOOD PREPARATION

SFB-5-206

Faculty of Engineering, Science & the
Built Environment
Department of Applied Science

2010/2011

Level 5

become what you want to be

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1. UNIT DETAILS

Unit Title:	Safe Food Preparation
Unit Level:	5
Unit Reference Number:	SFB-5-206
Credit Value:	30 CAT points
Student Study Hours:	300
Contact Hours:	90
Private Study Hours:	210
Pre-requisite Learning (If applicable):	120 Credits at Level 4 to include microbiology and Foodology
Co-requisite Units (If applicable):	None
Course(s):	BSc (Hons) Food Science, BSc (Hons) Food & Nutrition
Year and Semester	2010/2011 Semester 1 & 2
Unit Coordinator:	Ken Spears
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Teaching Team & Contact Details (Name, Email, phone, room number):	Adri Bester bestera@lsbu.ac.uk (0)20 7815 8132, B147 Mandy Maidment maidmem@lsbu.ac.uk (0)20 7815 7937, B139
Subject Area:	Food and Biosciences
Summary of Assessment Method:	Portfolio (30%), Group Presentation (30%), End of unit Examination (40%)

2. SHORT DESCRIPTION

This extended unit aims to provide students with a sound foundation of safe food operations in the modern food and drink industry. The first part of the unit covers the modern principles of food hygiene, which should underpin and permeate all safe and successful operations in all sectors of the industry. Students will learn the principles of modern food hygiene covering personal hygiene, hygienic design and maintenance of food premises and of plant and equipment. This learning will be enhanced and supplemented with visits to local food businesses. This part of the unit is intended to cover more than that required by qualifications such as Foundation Certificate in Food Hygiene – Level 2 offered by the Royal Society for Public Health (RSPH). The second part of the unit will introduce students to the modern concepts of food safety, covering its microbiological, chemical and physical aspects, as well as provide students with a comprehensive overview of the principles of food preservation. Coverage of the internationally recognised principles of hazard analysis critical control point (HACCP), which are legal requirements within EU/UK hygiene of foodstuffs regulation, will adequately prepare students for the Level 3 Award in HACCP for Food Manufacturing offered by the RSPH, or similar qualifications.

3. AIMS OF THE UNIT

The aims of this unit are:

- To equip students with the principles and practices of safe food preparation in today's modern food and drink industry.
- To familiarise students with the modern principles of food hygiene that separates food businesses from non-food businesses.
- To show that effective food hygiene involves personal hygiene, and hygienic design, operation and maintenance of food premises and of plant and equipment.
- To introduce students to the modern concepts of food safety that recognise absolute safety is impossible and involve hazards, which can be microbiological, chemical and physical in nature.
- To give students a thorough understanding of the principles and application of hazard analysis and critical control point (HACCP) for the management of food safety.

- To describe the principles of food preservation, covering both traditional technologies and more recently established ones.
- To enable students to look at a food preservation technology taking into consideration food safety, quality, nutrition, economy, health & safety and environmental impact.

4. LEARNING OUTCOMES

4.1 Knowledge and Understanding

- Outline the principles of safe food preparation in today's modern food and drink industry.
- Know that effective food hygiene involves personal hygiene, and hygienic design, operation and maintenance of food premises and of plant and equipment.
- Attempt with confidence the examination leading to Foundation Certificate in Food Hygiene – Level 2 or similar qualifications.
- Understand absolute food safety is unattainable, that assuring food safety involves tackling microbiological, chemical and physical hazards.
- Understand the principles of HACCP and know how to apply them effectively.
- Attempt with confidence the examination leading to Level 3 Award in HACCP for Food Manufacturing or similar qualifications.
- Outline the principles of food preservation, covering both traditional and more recently established technologies.
- Evaluate a food preservation technology taking into account of food safety, quality, nutrition, economy, health & safety at work and environmental impact.

4.2 Intellectual Skills

- Explain the importance of food hygiene, which is an integral part of all safe and successful food operations.
- Understand and appreciate the relationship and complementary roles of personal hygiene and hygienic conditions of the infrastructure.
- Understand the multi-faceted nature of food safety, its significance at all levels of food trade, and that its assurance is best effected employing preventive approaches.
- Appreciate that food preservation is not a modern phenomenon but effective and appropriate food preservation is central to the food industry worldwide.

4.3 Practical Skills

- Students will learn basic practical skills in food preparation and be able to use some laboratory scale food processing equipment while observing applicable health and safety regulations and good laboratory practice principles.
- Students who elect to sit and pass the examination leading to Level 3 Award in HACCP for Food Manufacturing or similar qualifications will be regarded as being able to demonstrate competence in the understanding of HACCP principles and their application as stipulated in industrial standard such as the BRC Global Standard Food (issue 5, 2008).

4.4 Transferable Skills

- Communication skills – use of oral and written communication skills is required, encouraged and developed in this unit.
- Numeracy skills – the quantitative nature of food preservation means that these are required and further developed in this unit.
- Use of information technology – this is required both in the search of relevant information, and in the preparation of processing of assignments and practical reports.
- Learning how to learn – there will be plenty of opportunity that requires and encourages students to further develop this skill.

- Understanding of methodologies – this skill will be explicitly underlined and developed in the coverage of HACCP and in the various practical sessions.
- Ability in critical analysis – food preparation activities and processes are often multifactorial and complex. Opportunities for students to develop this skill will be available through tutorials and practical sessions, either individually or in groups.

5. ASSESSMENT OF THE UNIT

- Coursework portfolio on food hygiene (30%)
- Group presentation on food preservation (30%)
- End-of-unit unseen examination (40%)

6. FEEDBACK

Feedback will normally be given to students 15 working days after the submission of an assignment.

7. INTRODUCTION TO STUDYING THE UNIT

7.1 Overview of the Main Content

Food Hygiene. Hygiene regulation in the EU/UK; personal hygiene, levels of hygiene training; hygienic design, operation and maintenance of plant and equipment, hygienic design, construction and maintenance of food premises; sources of contamination; European Hygienic Equipment Design Group (EHEDG) guidelines; good manufacturing practice (GMP), good catering practice (GCP) and good hygiene practice (GHP) and their relationship; effective hygiene management and auditing; housekeeping, cleaning and disinfection; cleaning-in-place and cleaning out of place; current and new methods of decontamination of equipment and environment; monitoring of effectiveness of cleaning and disinfection; control and safety of cleaning chemicals; pest control; control of foreign matters.

Food Safety. Modern concepts of food safety; microbial, chemical and physical hazards in food processing and preparation; assurance of food safety, the HACCP principles and their application in all sectors of the industry, FSA's Safe Food Better Business (SFBB).

Food Preservation. Purposes of food preservation; thermal processing; low temperature preservation techniques; drying and water activity; chemical preservation methods; microbial preservation systems; modified atmosphere packaging and vacuum packaging; novel techniques including non-thermal technologies of food preservation e.g. high-pressure processing, irradiation, pulsed electric fields etc.; combined methods of preservation, hurdle concept and related technologies; quality, and environmental aspects of food processing and preservation, nutritional aspects of food processing.

7.2 Overview of Types of Classes

Food safety requires a combination of student capabilities: a sound knowledge of the principles of managing the production of safe food and practical skills in producing high quality food products, the ability to evaluate food products and opportunities to view commercial food production facilities.

Types of learning situations that you will experience include keynote lectures on particular themes to help underpin your knowledge of the subject knowledge, case studies, demonstrations, practical investigations in the laboratories and industrial visits. We will also arrange talks by guest lecturers which maybe outside the normal timetabled sessions.

WE HAVE AGREED THIS CODE OF CONDUCT:

CODE OF CONDUCT
FOR
LECTURE THEATRES AND CLASSROOMS

The behaviour and conduct in lecture theatres and classrooms should be conducive to teaching and learning for all participants.

Students not adhering to this code will be asked to leave and persistent offenders may be subject to the University's disciplinary procedures.

A lecturer has the right to end a teaching session if this code is significantly breached.

	Code
1	Students are expected to show consideration towards others at all times. Talking should be kept to a minimum when a lecture is in progress. Shouting or other forms of distracting behaviour of any kind is not permitted.
2	Students will not be allowed to enter the lecture theatre or classroom 15 minutes after the scheduled start. Latecomers should wait until a *scheduled break* before joining the class.
3	Entering and leaving a room during a lecture is not allowed. Students should not leave the room during a lecture. The breaks between lectures are the time to use the toilet facilities. You will be told when a break begins.
4	Your attention is required throughout the lecture. Students who cannot give the lecturer their full attention, or who prefer to do something else, should not be in the lecture and will be asked to leave.
5	Mobile phones and MP3 players *must* be switched off. You will need to bring a proper calculator to the teaching sessions.
6	You are not allowed to record the lecture without the lecturer's permission.
7	Browsing the internet using a laptop computer during a lecture is not permitted unless advised by the lecturer / tutor.
8	Wait quietly outside a room when a lecture or examination is in progress.
9	Tutorials require students to participate in discussions, exercises or other activities. If you do not intend to participate, or have not done the preparatory work, do not attend.
10	Students are forbidden from operating the audio visual equipment in the teaching rooms.
11	Computer terminals and other equipment should be used in the appropriate manner and only to meet the learning outcomes of the session. Terminals should not be used during a class for accessing material not relevant to the exercise.
12	Eating during a lecture is not permitted.
13	Remove your waste when you leave.

7.3 Importance of Student Self-Managed Learning Time

Food is a wide and multidisciplinary subject. Elements covered during contact time must be developed and reinforced during your own self managed learning time.
We cannot guarantee success in this Unit, but can indicate what YOU need to do to take full advantage of the learning available and thereby maximise your chances of success.

This is what to do:

- Attend ALL sessions punctually.
- Actively engage in the activities and discussions involved.
- When out of class, try to apply the ideas covered in the Unit. Shopping, eating and cooking are the obvious occasions, but non-food situations also use the principles. Think of examples.
- Use the recommended text books to provide the background theory needed.
- Read widely and TAKE NOTES
- Submit coursework for assessment before the deadline.

7.4 Employability

The unit will help develop skills, understandings and personal attributes that makes graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy. The unit will enable the learner to appreciate the wide career opportunities in ‘food’ as a multi-disciplinary subject. Learners will have contact with a number of professionals from industry, local authorities, the media and through professional meetings and visits.

8. THE PROGRAMME OF TEACHING, LEARNING AND ASSESSMENT

PART 1 SEMESTER 1 FOOD HYGIENE and FOOD SAFETY
THURSDAYS 2 – 5 pm

Week	Date	*Activity*	
W1, S1	30 Sep	Introduction to Unit. Description of learning outcomes. Criteria for success. **'Adopt a pathogen'** The costs of food poisoning / unsafe food. What can go wrong if food hygiene as a policy is not implemented?	K Spears
W2, S1	7 Oct	Report back on pathogen. The legal framework for food hygiene and food safety. The 'why' and the 'how'. Case study approach. Preparation for visits. Practical approaches	K Spears
W3, S1	14 Oct	Hazards – the threats to food safety. Microbiological criteria for foods. Practical approaches to maintaining a safe environment.	K Spears
W4, S1	21 Oct	Visit 1	K Spears
W5, S1	28 Oct	Auditing and assurance	K Spears
W6, S1	4 Nov	Visit 2	K Spears
W7, S1	11 Nov	HACCP – a risk assessment approach to food safety	K Spears
W8, S1	18 Nov	Preparing for domestic audit. Effective cleaning and use of BIOTRACE	K Spears
W9, S1	25 Nov	Culturing samples from swabs and air plates	M Maidment K Spears
W10, S1	2 Dec	Examination of swab cultures.	M Maidment K Spears
W11, S1	9 Dec	Visit	K Spears
W12, S1	16 Dec	Role of personnel and personal hygiene. Food handlers – fitness to work. Cleaning and disinfection Follow up discussion to visit 3	K Spears
Christmas vacation.			
W16, S1	13 Jan 2011	Resolution of Portfolio issues from students. Cooking as a means of assuring food safety	K Spears
W17, S1	20 Jan 2011	**SUBMISSION OF PORTFOLIOS – Friday 21 January 2011** Sous Vide	K Spears
W18, S1	27 Jan 2011	Review and QUESTION TIME Developments in rapid testing for pathogens.	K Spears

PART 2 SEMESTER 2 FOOD PRESERVATION

Thursdays 2 – 5 pm

Week	Date	Topics covered		
W19, S2 -1	3 Feb	Introduction to the unit and assessment requirements. Food preservation as a form of food processing. Reasons for food processing and preservation. Food spoilage and pathogenicity. Traditional methods of food preservation – measuring their success.		
W20, S2-2	10 Feb	Food preservation – defining the technology. Introducing terminology. Providing an organised view of food preservation methods.Thermal preservation using high temperature. Heat transfer and steady state. Importance of pH in defining 'pasteurisation' and 'commercial sterilisation'. **ASSIGNMENT 1: Worksheet (steady state and SAQs)**		
W21 S2-3	17 Feb	Commercial sterility. D-value, z-value, Fo values. Practical approaches to sterilisation, canning, pouch, aseptic processing, UHT.		
W22, S2-4	24 Feb	Emerging and established food preservation techniques: High pressure, irradiation, pulsed field. Other emerging technologies.		
W23, S2-5	3 Mar	Water activity. Defining Aw. Aw and moisture content – the sorption isotherm. Achieving low Aw values in foods. Intermediate moisture foods (IMF). Water activity meter.		
W24, S2-6	10 Mar	Modified atmospheres and its use in packaged foods.		
W25, S2-7	17 Mar	Drying as a traditional method of preservation. Modern drying methods. Reconstitution of dried foods. Nutritional quality.		
W26, S2-8	24 Mar	Preservation using reduced temperature. Chilling and freezing. What temperatures do we need to achieve.		
W27, S2-9	31 Mar	Preservation using chemicals and additives. Importance of pH, salt and chemical preservatives. Sulphur dioxide and other chemical preservatives.		
W28 S2-10	7 Apr	**GROUP PRESENTATIONS and SUMMARY SHEETS**		
EASTER VACATION				
W32, S2-11	5 May	Practical Investigations: Pasteurisation of raw egg; Calculation of Fo values for a canned food; Soluble solids and water activity.		
W33, S2-12	12 May			
W34, S2-13	19 May			
W35 S2-14	EXAMS			
W36	RECESS WEEK			
W37 S2-15	EXAMS			

9. STUDENT EVALUATION

This is the first cohort for the unit.

10. LEARNING RESOURCES

Indicative Sources:

10.1 Core reading:

- McLaughlin, J. and Little, C. (Eds) (2007) *Hobbs' Food Poisoning and Food Hygiene* Hodder and Arnold, London
- Fellows P J (2000) *Food Processing Technology: Principles and Practice,* 2nd edition. Woodhead Publishing Limited, Cambridge, UK.
- Safe Food Processing
- Sprenger R A.(2005) *Hygiene for Management*. 11th Edition, ISBN 1 904544 25 8, Highfield Publications

10.2 Optional reading:

- CIEH coursebook (1998) *Food Safety First Principles* Chadwick House Group (Level 2 Food Safety in Catering Course Book)
- Lelieveld H L M, Mostert M A and Holah J (eds) (2005) *Handbook of hygiene control in the food industry*. Woodhead Publishing Limited, Cambridge, UK.
- Mortimore S E, Wallace C and Cassianos C (2001) *HACCP*. Food Industry Briefing Series, Blackwell Science, Oxford, UK.
- Scott Smith J and Hui Y H (eds) (2004) *Food Processing: Principles and Applications.* Wiley-Blackwell, Oxford, UK
- Anon (2007) *Understanding Basic Food Hygiene and Safety Regulations: a guide for food businesses.* Food Solutions Publishing Ltd., Cheshire, UK.

USEFUL WEBSITES

www.food.gov.uk

www.ifst.org

www.foodqualitynews.com

FURTHER DETAILS ABOUT ASSESSMENT

- Coursework portfolio on food hygiene (30%)
- Group presentation on food preservation (30%)
- End-of-unit unseen examination (40%)

PORTFOLIO

The portfolio is a self managed folder reflecting your learning in food hygiene and food safety.

Submission date: Friday 21 January 2011

It consists of 4 main sections:

I A description of the legal framework for food safety including food hygiene. Cross references to the key regulations relating to food hygiene. Include examples of case studies illustrating the importance of meeting legal requirements.

II Details about the selected pathogen. The characteristics and pathogenicity. Data relating to incidences of food poisoning. Emerging trends and current research.

III Reports of visits and your evaluation of observed hygiene and food safety practice.

IV A 500 word statement explaining how you have met the learning outcomes and a reflection of your own learning

Food Hygiene portfolio

FEEDBACK & ASSESSMENT

NAME:

THE LEGAL FRAMEWORK FOR FOOD HYGIENE	**20 marks**
Identified principal legal sources	5 4 3 2 1 0
Identified key legal requirements	10 8 6 4 2 0
Presented a concise case / used examples	5 4 3 2 1 0

YOU COULD HAVE IMPROVED THIS SECTION BY..

DESCRIPTION OF A FOOD PATHOGEN	**20 marks**
Have you written about the key characteristics / pathogenicity	10 8 6 4 2 0
Have you included relevant cases / articles and showed emerging trends	10 8 6 4 2 0

YOU COULD HAVE IMPROVED THIS SECTION BY..

REPORT OF VISITS	**40 marks**
Billingsgate fish market (structure and fabric)	10 8 6 4 2 0
Westminster Kingsway College (personal hygiene)	10 8 6 4 2 0
Domestic and microbiological audit	10 8 6 4 2 0
Simmons Bakery (food hygiene control and HACCP)	10 8 6 4 2 0

YOU COULD HAVE IMPROVED THIS SECTION BY..

PERSONAL REFLECTION	**20 marks**
Inclusion of relevant additional material and references	10 8 6 4 2 0
Identfying learning outcomesSections and communication	5 4 3 2 1 0
Overall presentation	5 4 3 2 1 0

YOU COULD HAVE IMPROVED THIS SECTION BY..

GROUP PRESENTATION ON FOOD PRESERVATION

WEEK 28 7 April 2011

The Group (4) will make a presentation to describe an emerging / innovative method of food preservation. The presentation will consist of 4 elements:

A description of the method / technique
Areas of application and suitable foods and cost implications
Research and development needed to establish the technique
Identification of key drivers likely to promote the adoption of the technique.

Each member of the group will present one of the key elements.
Each member of the group will also submit a 500 word summary relating to that element.

Presentation	50%
Summary	50%

EXAMINATION

6 Questions Answer 4

Typical questions:

Question
The goals of food preservation are to supply foods to the consumer that meet the following requirements:

Safe (low risk from hazards)
Convenient to use
Have a long shelf life
Attractive in appearance
Acceptable flavour and texture
Retain their original nutrients

Select FOUR of these goals and explain how successfully they are met in:

Pasteurised milk (4 x 3 = 12 marks)

Modified atmosphere packaged meat (4 x 3 = 12 marks)

Suggest ONE other desirable goal in food preservation (1 mark)

Question

The following table gives some reasons for continuing causes of food poisoning.

Food is prepared too far in advance eg a wedding buffet where food is left out in warm surroundings
Cooling food too slowly at room temperature
Cross contamination of cooked foods with raw foods or ingredients
Infected food handlers

Select TWO of these reasons and explain why the circumstances could lead to food poisoning.

[15 marks]

For each of the two reasons, what steps would you take to improve food safety?

[10 marks]