University of the West of England
BRISTOL

ACADEMIC SERVICES

MODULE SPECIFICATION

Part 1: Basic Data						
Module Title	Respiratory & Sleep Physiology & Pathophysiology B					
Module Code	USSKBA-30-2		Level	2	Version	1.1
Owning Faculty	Health and Applied Sciences		Field	Applied Sciences		
Department	Applied Sciences					
Contributes towards	BSc (Hons) Healthcare Science (Cardiac Physiology), BSc (Hons) Healthcare Science (Respiratory & Sleep Physiology)					
UWE Credit Rating	30	ECTS Credit Rating	15	Module Type	Standard	
Pre-requisites	None		Co- requisites	USSKAY-30-2 Respiratory & Sleep Physiology & Pathophysiology A		
Excluded Combinations	Cardiac Physiology A and B [for those registered on HCS(PS)]		Module Entry requirements	Appropriate Experiential Learning		
Valid From	September 2014		Valid to	September 2020		

CAP Approval Date	V1 *August 2014* V1.1 *July 2016*

Part 2: Learning and Teaching	
Learning Outcomes	On successful completion of this module the student will: **A. Lung Function Test Equipment – assessed in components A1&2 + B1&2** 1. Discuss the need for calibration and quality assurance for all measurements undertaken in Respiratory and Sleep Science. 2. Explain the principles of operation of respiratory gas analysers to measure commonly used gases in respiratory measurement, and the routine procedures for their care and calibration. 3. Review the range of equipment used to measure flow, volume and pressure in Respiratory and Sleep Science 4. Review the principles and operation of pulse oximeters.

B. Lung Function Tests – assessed in components A1&2 + B1&2

1. Explain the application of dynamic lung volumes and flows in routine clinical practice.
2. Discuss the role and application of inhaled drug therapy in the management of respiratory disease.
3. Discuss the methods used to estimate static lung volumes, and compare these techniques
4. Explain the structure-function relationship determining gas exchange and the measurement of Carbon Monoxide Transfer Factor.
5. Explain the different techniques for measuring respiratory muscle function
6. Explain the use of pulse oximetry in Respiratory and Sleep Science

C. Defining Normal – assessed in componenets A1&2 + B1&2

1. Explain the concept of "normal" and the calculation, use and limitations of reference values, reference ranges, Lower Limits of Normal (LLN) and standardized residuals in defining normal and abnormal lung function.
2. Explain the normal physiological variability in humans in a range of tests from birth to old age
3. Explain and evaluate the methods available for assessing respiratory function in children ≥ 5 years of age through to adults.

D. Communication + analysis – assessed in component B1&2

1. Evaluate and synthesise material from a variety of sources to assess the needs/diagnosis of patients
2. Evaluate clinical scenarios based on current literature and guidelines
3. Communicate clinical information effectively

In addition to these outcomes, the students are expected to integrate knowledge from this module with the content of USSKAY-30-2.

The exact Learning Outcomes assessed in component B will alter year on year but will reflect one or more of the Learning Outcomes listed above.

In addition, the educational experience may explore, develop, and practise but not formally discretely assess the following Professional aspects, as set out within the Modernising Scientific Careers Curriculum:

1. Respect and uphold the rights, dignity and privacy of patients.
2. Establish patient-centred rapport.
3. Appreciate the empathy and sensitivity needed when dealing with the patient experience of long-term conditions and terminal illness.
4. Actively seek accurate and validated information from all available sources with respect to respiratory and sleep investigations.
5. Select and apply appropriate analysis or assessment techniques and tools.
6. Critically discuss the problems associated with the care of patients undergoing respiratory investigations or treatments.
7. Discuss complex scientific information in ways that can be understood by patients and practitioners in other areas.
8. Use correct terminology when discussing scientific issues.
9. Work safely in clinical areas.

Syllabus Outline	**Indicative Content**

A. Lung Function Test Equipment

1. Characteristics of test equipment

- Flow and volume devices
- Pressure transducers
- Temperature measurements
- Gas Analysers – CO, CH_4, Helium
- Pulse oximeter

2. Cleaning & infection control procedures

3. Calibration and quality assurance procedures

- Flow and volume devices
- Pressure transducers
- Gas Analysers

B. Lung Function Tests

1. Techniques used in the assessment of lung function

- Assessment of resting lung function
- Assessment of non-resting lung function
- Assessment during sleep

2. Dynamic Lung Volumes and Flows

- Indications
- Contra-Indications
- Recommended technique – Volume-time vs Flow Volume
- Calculations
- Common problems
- Interpretation of results

3. Reversibility Testing

- Drugs routinely used in reversibility testing
- Indications
- Contra-Indications
- Recommended measurements
- Calculations
- Common problems
- Interpretation of results

4. Static Lung Volumes

- Characteristics of recording equipment
- Indications
- Contra-Indications
- Techniques - Body Plethysmography, Nitrogen Washout, and Helium Dilution
- Calculations
- Common problems
- Interpretation of results

5. Measurement of CO Gas Transfer

- Structure-Function Characteristics
- Pathway of Diffusion
- Indications
- Contra-Indications
- Measurement technique – single-breath and rebreathing
- Calculations
- Technical and Physiological Variations
- Interpretation of results

	6. Pulse Oximetry • Indications • Contra-Indications • Measurement technique • Common problems • Interpretation of results **C. Defining Normal** **1. Reference ranges, LLN and SR's** • Basic Statistics • Derivation of Reference Equations • Application of reference equations • Limitations of current reference equations **2. Reporting Results** • Percent predicted • Standardized Residuals (z-scores) • National guidelines **3. Development and ageing of respiratory system** • In utero • Birth to aged 5 year • 5 years to 18 years • 18 years onwards Students are also expected to integrate the content of this module with that USSKBA-30-2 to gain a thorough understanding of the scientific basis and diagnosis of respiratory conditions.
Contact Hours/Scheduled Hours	The module will be delivered by specialist practitioners and will be a blended learning approach comprising – online lectures, face-to-face lectures, seminars, tutorials, practicals, and observational visits to local centres as appropriate to the module content. •
Teaching and Learning Methods	Students are expected to spend 72 hours on scheduled learning and 228 hours on independent learning. Independent learning will take the following forms with an approximate indication of time required for each: • Essential reading to support acquisition of knowledge relating to lectures and practical exercises – 104 hours • Researching case studies, including accessing VLE scenarios such as 'Virtual Patient' – 37 hours • Preparation and submission of assessment – 15 hours • Revision and preparation for exam – 72 hours **Scheduled learning** includes lectures, tutorials, demonstration, practical classes and workshops; external visits. **Independent learning** includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc.

Reading Strategy	Students will be expected to purchase one or more of the Essential texts listed and to access the further reading. The module booklet will set out which text(s) should be purchased – where more than one, the cost of items and/or their use on other modules will have been considered in making the recommendation. Copies of essential texts will be provided within the library stock, on restricted loan for reference. Further reading will be provided as handouts, or as digitalised book chapters or journal articles, where free electronic access is not available. All students are encouraged to read widely using the library catalogue, a variety of bibliographic and full text databases and Internet resources. Many resources can be accessed remotely. Guidance to some key authors and journal titles available through the Library will be given in the Module Guide and updated annually. Assignment reference lists are expected to reflect the range of reading carried out. Students are expected to be able to identify and retrieve appropriate reading. This module offers an opportunity to further develop information skills introduced at Level 1. Students will be given the opportunity to attend the GDP sessions on selection of appropriate databases and search skills. Additional support is available through the Library Services web pages, including interactive tutorials on finding books and journals, evaluating information and referencing. Sign up workshops are also offered by the Library.
Indicative Reading List	There is no one essential text for this course, therefore students are guided to access a range of texts available either in hardcopy through the library or electronically as free access material or as digitalised copies available on Blackboard and through the library. Bourke, S.J. Burns, G.P. (2011) *Lecture Notes: Respiratory Medicine*. Oxford: Wiley-Blackwell Cotes, J.E. Chinn, D.J. Miller, M.R. (2006) *Lung Function*, 6th ed. Oxford: Blackwell Publishing Davies, A. and Moores, C. (2011) *The Respiratory System.* 2nd ed.. Edingburgh: Churchill Livingstone Gibson, G.J. (2009). *Clinical Tests of Respiratory Function*, 3rd ed. London: Hodder Arnold Hughes, M. (2010) *Physiology & Practice of Pulmonary Function*. Boldmere: Association of Respiratory Technology & Physiology. Lumb, A.B. (2010). *Nunn's Applied Respiratory Physiology*, 7th ed. Edingburgh: Churchill Livingstone. Maskell, N. Millar, A. (2009). *Oxford Desk Reference: Respiratory Medicine*. Oxford: OUP Naish, J., Revest, P. and Syndercombe, Court, D. (2009) *Medical Sciences*. Edinburgh: W.B Saunders Newall, C., Evans, A., Lloyd, J., Shakespeare, J. & Carter, R. *ARTP Handbook in Spirometry*. 2nd ed.. Lichfield: Association of Respiratory Technology & Physiology Ruppel, G.L. (2003) *Manual of Pulmonary Function Testing*. 8th ed., London: Mosby

	Shneerson, J.M. (2005). *Sleep Medicine: a guide to sleep and its disorders.*, 2nd ed. Oxford: Blackwell ARTP, (2003)*The ARTP Practical Handbook of Respiratory Function Testing - Part 1.* 2nded. Lichfield: Association of Respiratory Technology & Physiology. ARTP,(2005) *The ARTP Practical Handbook of Respiratory Function Testing - Part 2.* 2nd ed.. Lichfield: Association of Respiratory Technology & Physiology. West, J.B. (2012) *Respiratory Physiology The Essentials*. 9th ed.. Philadelphia, PA: Lippincott Williams & Wilkins **Journals** Respiration Physiology Thorax Chest European Respiratory Journal Respiratory Medicine Therapeutic Advances in Respiratory Disease Journal of Sleep Research Sleep and Breathing

Part 3: Assessment	
Assessment Strategy	The assessments within this module have been designed to show that the student has developed the required knowledge and clinical skills required of a respiratory & sleep physiologist. There will two components to the assessment of this module **Component A**: Two examinations under controlled conditions, in order to test knowledge, understanding and data analysis. **Component B**: Integrated assignment, including a written report and an oral presentation with questions. This will test communication skills and the ability to use and evaluate/synthesise multiple literature and data sources.

Identify final assessment component and element	**A2**	
% weighting between components A and B (Standard modules only)	**A:**	**B**:
	50	**50**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Examination 1 (1.5 hours)	50
2. Examination 2 (1.5 hours)	50
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Integrated Assignment	70
2. Oral Presentation (30 minutes including questions)	30

Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Exam (3 hours)	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Extended Case-study (3000 words)	100

If a student is permitted an **EXCEPTIONAL RETAKE** of the module the assessment will be that indicated by the Module Description at the time that retake commences.