

Liverpool John Moores University

Title: EXERCISE PHYSIOLOGY
Status: Definitive
Code: **5002SPOSCI** (114238)
Version Start Date: 01-08-2011

Owning School/Faculty: Sports Sciences
Teaching School/Faculty: Sports Sciences

| Team | Leader |
|---------------|--------|
| Dominic Doran | Y |

Academic Level: FHEQ5 **Credit Value:** 24.00 **Total Delivered Hours:** 68.00
Total Learning Hours: 240 **Private Study:** 172

Delivery Options

Course typically offered: Standard Year Long

| Component | Contact Hours |
|-----------|---------------|
| Lecture | 42.000 |
| Practical | 24.000 |

Grading Basis: 40 %

Assessment Details

| Category | Short Description | Description | Weighting (%) | Exam Duration |
|----------|-------------------|------------------|---------------|---------------|
| Report | AS1 | Essay/lab report | 50.0 | |
| Exam | AS2 | Examination | 50.0 | 2.00 |

Aims

To develop knowledge and understanding of both theoretical and applied aspects of systemic and muscular physiological and biochemical responses to sport and exercise stress.

Learning Outcomes

After completing the module the student should be able to:

- 1 Analyse the role carbohydrates, lipids and protein play as an energy sources for both short-term and prolonged muscular activity.
- 2 Describe and explain the role physiological systems play in the maintenance of homeostasis during physical activity and exercise.
- 3 Account for and interpret the responses of selected physiological variables before, during and after incremental and /or steady state exercise of varying intensities and duration.
- 4 Compare and contrast the acute and chronic cardio-respiratory, muscular endocrine renal and pulmonary adaptations occurring as a consequence of acute exercise stress and training.
- 5 Discuss the theoretical basis of differing ergometric techniques for the assessment of anaerobic power and capacity, strength and flexibility.
- 6 Discuss the theoretical basis of lactate metabolism and techniques for assessing its impact on exercise performance.
- 7 Compare and contrast the difference between muscle fiber types, and examine their physiological and metabolic responses to exercise and training.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

| | | | | | |
|-------------|---|---|---|---|---|
| Lab report | 1 | 2 | 3 | 4 | 7 |
| essay style | 1 | 4 | 5 | 6 | 7 |

Outline Syllabus

Acute and chronic cardiovascular responses and adaptations to exercise stress.
Acute and chronic pulmonary responses and adaptations to exercise stress.
Muscle adaption to acute and chronic exercise
Theoretical perspectives on VO₂ max and adaptations to training.
Gene expresssion and muscle adaptions.
Kidney function and acid base balance.
Energy for muscle: role of carbohydrates
Lactate metabolism and sport performance
Energy for muscle: role of lipids and amino acids.
Determination of carbohydrate and fat oxidation rates from respiratory measures.
Muscle fibre type: physiology and performance.
Theory of Muscle strength and Flexibility.
Mechanism of Fatigue
Thermoregulatory responses to exercise stress.

Learning Activities

Students will be required to attend lectures, laboratory practicals and demonstrations. In addition they will be expected to engage in prescribed reading in order to satisfactorily complete coursework tasks and the examination.

References

| | |
|------------------------|---|
| Course Material | Book |
| Author | Astrand, P.O., Rodahl, K,Dahl, H.A., and Stromme,S.B. |
| Publishing Year | 2003 |
| Title | Textbook of Work Physiology |
| Subtitle | Physiological Basis of Exercise |
| Edition | 4th |
| Publisher | Human Kinetics |
| ISBN | 0-7360-0140-9 |

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|------------------------|--|
| Course Material | Book |
| Author | Brooks, G. & Fahey, T. |
| Publishing Year | 2000 |
| Title | Exercise Physiology |
| Subtitle | Human Bioenergetics and its Applications |
| Edition | 3rd |
| Publisher | Mayfield |
| ISBN | |

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|------------------------|---|
| Course Material | Book |
| Author | Houston, M.E. |
| Publishing Year | 2001 |
| Title | Biochemistry Primer for Exercise Sciences |
| Subtitle | |
| Edition | 2nd |
| Publisher | Human Kinetics |
| ISBN | |

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|------------------------|--|
| Course Material | Book |
| Author | McArdle, W.D., katch, F.I. & katch, V.L. |
| Publishing Year | 2002 |
| Title | Exercise Physiology |
| Subtitle | Energy, Nutrition and Human Performance |
| Edition | 2nd |
| Publisher | Lippincott, Williams & Wilkins |
| ISBN | |

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|------------------------|----------------------------------|
| Course Material | Book |
| Author | Wilmore,J.H. and Costill, D.L. |
| Publishing Year | 2004 |
| Title | Physiology of Sport and Exercise |
| Subtitle | |
| Edition | 3rd |

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|------------------|----------------|
| Publisher | Human Kinetics |
| ISBN | 0-73604489-2 |

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|------------------------|-------------------------------------|
| Course Material | Book |
| Author | Plowman,S.A. and Smith,D.L |
| Publishing Year | 2003 |
| Title | Exercise Physiology |
| Subtitle | for Health, Fitness and Performance |
| Edition | 2nd |
| Publisher | Benjamin Cummings |
| ISBN | 0-8053-5349-6 |

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|------------------------|--------------------------------------|
| Course Material | Book |
| Author | Birch,K., MacLaren,D., and George,K. |
| Publishing Year | 2004 |
| Title | Sport and Exercise Physiology |
| Subtitle | Instant Notes |
| Edition | 1st |
| Publisher | BIOS Scientific Publishers |
| ISBN | 1-8599-6249-1 |

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|------------------------|---------------------|
| Course Material | Book |
| Author | Hale,T |
| Publishing Year | 2003 |
| Title | Exercise Physiology |
| Subtitle | A Thematic Approach |
| Edition | 1st |
| Publisher | Wiley |
| ISBN | 0-470-84683-6 |

Notes

This module extends the information introduced at Level I SPSSS1042 Physiological Foundations in terms of applying basic system physiology to explore adaptations in response to acute and chronic exercise stress