

BIOLOGICAL RHYTHMS - 2024/5

Module code: BMS3066

Module Overview

The Biological Rhythms module is designed to provide students with a comprehensive, research-led overview of current topics in Biological Rhythms, with an emphasis on mammalian Chronobiology. The module builds on critical evaluation skills developed in previous modules, including appraisal and interpretation of scientific literature and evaluating current gaps in our knowledge. The module is delivered as a mix of lectures, online content, and several tutorials in which knowledge is integrated and evaluated. The summative assessment of this module consists of two pieces of course work, in which students apply skills in digital literature searches, resourcefulness in evaluating literature and interpreting current knowledge to develop forward-looking views that apply and validate research insights in real world conditions.

Module provider

School of Biosciences

Module Leader

VAN DER VEEN Daan (Biosciences)

Number of Credits: 15

ECTS Credits: 7.5

Framework: FHEQ Level 6

Module cap (Maximum number of students): N/A

Overall student workload

Independent Learning Hours: 64

Lecture Hours: 27

Tutorial Hours: 7

Guided Learning: 20

Captured Content: 32

Module Availability

Semester 2

Prerequisites / Co-requisites

None

Module content

Indicative content includes:

- Basic principles
- Photoreception
- SCN clock
- Clock genes
- Peripheral clocks
- Endogenous melatonin and the circadian system
- Photoperiodism
- Comparative chronobiology
- Assessment of human circadian rhythms
- Circadian and sleep protocols - lab and field
- Circadian regulation of sleep
- Ageing as example
- Clock, metabolism, chrononutrition
- Rhythms in the gut
- Non-circadian rhythms and metabolism
- Chronobiology in the real world
- Consequences of shift work and Jetlag
- Circadian rhythm sleep-wake disorders
- Treatments of circadian rhythm sleep-wake disorders
- Genetic disorders of sleep timing
- Chronopharmacology
- Clocks and mental health

Assessment pattern

Assessment type	Unit of assessment	Weighting
Coursework	COURSEWORK I: 1500 word critique of research paper	50
Coursework	COURSEWORK II: 3 x 750 word written responses to thematic questions	50

Alternative Assessment

N/A

Assessment Strategy

The assessment strategy consisting of two course works is designed to provide students with the opportunity to demonstrate the ability to:

- Critically appraise and evaluate scientific findings from published literature
- Use electronic literature data bases effectively
- Write a critical structured essay with a fixed word limit.

The summative assessment for this module consists of:

1. Coursework I (50%). This is assessed based on structure, breadth and depth of content and clarity as well as presentation of a 1500 word essay to present a literature supported critique of a recent peer-reviewed research paper.
2. Coursework II (50%). This is assessed based on structure, breadth and depth of content and clarity as well as presentation of a three written responses (750 words per response) to question(s) raised on three separate topics covered in the module. Responses should be supported by literature.

The formative assessment and feedback for this module is provided via:

- Thematic, structured tutorials spaced throughout the module

- Drop-in sessions
- Content section on SurreyLearn
- Discussion boards on SurreyLearn
- Feedback on coursework I.

The assessment strategy of this module is specifically designed to develop the students’ digital skills and confidence and resourcefulness in evaluating information.

Module aims

- Develop students' understanding of the evolution and physiological importance of biological rhythms in a range of species, with an emphasis on mammalian species including humans.
- Develop students' knowledge of how biological rhythms are generated and controlled.
- Expand students' understanding of the importance of biological rhythms in occupational health and disease processes in humans.
- Expand students' knowledge of ultradian, circadian and seasonal timing with emphasis on areas of expertise within active research programmes at the University
- Further developing students¿ capabilities in searching and evaluating digital resources, and applying the scientific knowledge in these resources to real world conditions such as shift work, meal timing and daily light exposure.

Learning outcomes

		Attributes Developed
001	Describe the basic generation and control of circadian and seasonal rhythms	KCT
003	Appreciate the interaction between central and peripheral clocks, and the role of photic and nonphotic time cues for these clocks	KCT
004	Understand theoretical concepts and protocols and tools used to assess circadian rhythmicity	KCT
005	Describe the role of melatonin in circadian and seasonal rhythms	KCT
006	Appreciate the effect of ageing and individual light perception on circadian timing and sleep	KCT
007	Appreciate the links between clocks, sleep and metabolism and the contribution of underlying circadian rhythm disturbances to pathology e.g. sleep problems, mental health issues and disorders of metabolism	KCT
008	Appreciate chrononutrition, describing the circadian control of post prandial physiology and timed meals as synchronisers	KCT
011	Use electronic databases to selectively access information	PT
012	Critically evaluate the intellectual and technical aspects of published literature	CPT

		Attributes Developed
013	Show capacity for independent, critical thinking	CPT
014	Write a critical appraisal of literature in a structured and scientific manner	CPT
015	Apply knowledge and research findings to answer chronobiological questions	KCPT
009	Understand the concept of chronopharmacology and that drug treatment is affected by time of day and circadian timing	KCT
002	Describe the relevance of ultradian and seasonal rhythms	KCT
010	Describe circadian timing in the microbiome, and their link to health	KCT

Attributes Developed

C - Cognitive/analytical

K - Subject knowledge

T - Transferable skills

P - Professional/Practical skills

Methods of Teaching / Learning

The learning and teaching strategy is designed to provide the students with knowledge and understanding of key concepts via the set of lectures, whilst further developing and building on personal and transferable skills, first introduced in previous modules, that relate to critical evaluation of literature, as well as integration of knowledge via the tutorial sessions. Tutorial sessions provide the opportunity for students to define their difficulties or points where they would value feedback which is then timely delivered by the lecturer.

The learning and teaching methods include:

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- Lectures: 27 hours
 - Tutorials: 5 hours
 - Drop-in sessions: 2
 - Captured content: 32 hours
 - Guided learning (coursework): 20 hours
 - Independent learning: 64 hours

Indicated Lecture Hours (which may also include seminars, tutorials, workshops and other contact time) are approximate and may include in-class tests where one or more of these are an assessment on the module. In-class tests are scheduled/organised separately to taught content and will be published on to student personal timetables, where they apply to taken modules, as soon as they are finalised by central administration. This will usually be after the initial publication of the teaching timetable for the relevant semester.

Reading list

<https://readinglists.surrey.ac.uk>

Upon accessing the reading list, please search for the module using the module code: **BMS3066**

Other information

Resourcefulness & resilience: This module is designed to further build and develop the student’s ability to understand primary research, and engage with a constructively critical evaluation of value and quality of this research. The module is designed to that feedback on first coursework based on constructive critical assessment of literature can be used to improving the second coursework. In addition, regular tutorials and discussion board interaction also allow for discussion and exchange of ideas

Sustainability: The module highlights the role of natural and artificial light on biological rhythms, and also presents contents on biological rhythms in malaria transmission and mediating some of the effects of climate change.

Digital capabilities: The module uses discussion boards to ask questions and discuss module content. Both coursework assignments on the module promote the use internet sources to find literature.

Employability: There is a strong emphasis on further developing ‘constructive criticism’ in tutorials, discussion boards and course work.

Programmes this module appears in

Programme	Semester	Classification	Qualifying conditions
Biochemistry BSc (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Biochemistry MSci (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Biological Sciences (Animal Biology and Ecology) BSc (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Biological Sciences BSc (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Biomedical Science BSc (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Biomedical Science MSci (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Nutrition and Dietetics BSc (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Nutrition BSc (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Sport and Exercise Science BSc (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module

Please note that the information detailed within this record is accurate at the time of publishing and may be subject to change. This record contains information for the most up to date version of the programme / module for the 2024/5 academic year.