OTTO VON GUERICKE-UNIVERSITY

MAGDEBURG

Faculty of Humanities

Module Handbook

for the international master programme

Performance Analysis of Sport (IMPAS)

zur

Studien- und Prüfungsordnung vom 4.07.2012, in der Fassung vom 18.07.2012
in der Satzungsänderung vom 06.05.2025

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Otto von Guericke University Magdeburg
Institute III - Sport Science

MODULE SPECIFICATIONS

International M.Sc. in Performance Analysis of Sport (IMPAS) - Masters of Science Degree (MSc)

Table of content

Otto von Guericke University Magdeburg
Institute III - Sport Science

Module Specification

	Basic module information	
1	Module Title:	**Motor Control and Motion Analysis**
2	Module Code:	M1
3	Credit Points:	9 ECTS
4	Duration: Semester Working Hours (SWH):	14 weeks 2 SWH Lectures; 2 SWH Seminars
5	School:	Faculty of Humanities; K. Rehfeld
6	Campus:	Otto-von-Guericke University of Magdeburg, Germany
7	Date:	Winter Semester

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title
	none

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Program Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Module objectives & Skill development**

- Fundamental knowledge about skill classification, movement phases and use of deterministic models to identify main variables of motor performances for motion analysis
- Knowledge about theories in motor control (Capabilities and Limitations in sensory information, information processing, arousal and performance; speed-accuracy trade-off and neuromuscular junctions for motor control, motor performance
- Implementing motor learning skills in a motor learning circle considering the person, the task, the setting and review process
- Practical skills in planning and running investigations with latest technologies in movement analysis in respect to motor development and behaviour

11	**Module Content**
	This module aims to develop the student’s ability to: • Address research topics in neurophysiology and motor control within appropriate conceptual framework and methodologies; • Appreciate the strength and limitations of different methodologies available in the field of motor control and movement analysis; • Apply different methods for data acquisition such as surface-EMG, video-based-movement-analysis, measurement of acceleration and force, balance platform; 3D-motion capture (VICON) • Set-up of own investigation in terms of motor control and motion analysis

- **Indicative Reading**

- Witte, K., Bock, H., Storb, U., Blaser, P. (2003): A synergetic approach to describe the stability and variability of motor behaviour. In: Tschacher, W. & Dauwalder, J.-P. (eds.): The dynamical systems approach to cognition. Singapore: World Scientific Publishing Co. Pte.Ltd.
- Bongaardt, R. And Meijer, O.G. (2000). Bernstein’s theory of movement behaviour: Historical development and contemporary relevance. *Journal of Motor Behaviour*, **32**:57-71.
- Guyton, A.C, Hall, J.E. (2006). Textbook of medical physiology. Philadelphia: Elsevier Saunders.
- Purves, D., Augustine, G.J., Fitzpatrick, D., Hall, W.C., La Mantia, A.S., McNamara, J.O., White, L.E. (2008). Neuroscience. Sunderland: Sinauer Associates Inc.
- Drake, R.L., Vogl, A.W., Mitchel, A.W.M. (2009). Gray’s anatomy for students.
- Philadelphia: Churchill Livingstone.
- García-Pinillos, F., García-Ramos, A., Ramírez-Campillo, R., Latorre-Román, P. Á., & Roche-Seruendo, L. E. (2019). How do spatiotemporal parameters and lower-body stiffness change with increased running velocity? A comparison between novice and elite level runners. Journal of Human Kinetics, 70, 25.
- Blauberger, P., Horsch, A., & Lames, M. (2021). Detection of ground contact times with inertial sensors in elite 100-m sprints under competitive field conditions. Sensors, 21(21), 7331.
- Nielsen, E. T., Jørgensen, P. B., Mechlenburg, I., & Sørensen, H. (2019). Validation of an inertial measurement unit to determine countermovement jump height. Asia-Pacific journal of sports medicine, arthroscopy, rehabilitation and technology, 16, 8-13.
- Yoshimoto, T., Takai, Y., Ishii, Y., Kanehisa, H., & Yamamoto, M. (2015). Effect of a Single Jump Practice on Vertical Jump Performance. J Athl Enhancement 4: 3. of, 9, 2.

14	**Teaching and Learning** *Range of modes of direct contact* This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars
	This module will be delivered through a series of formal lectures, practical exercises, laboratory sessions and workshops. Total contact hours: 56
	Range of other learning methods This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research
	Use of on- and off- line learning resources Independent data collection, analysis and evaluation Directed reading Independent research Total non-contact hours: 214

15	**Assessment methods** This indicates the type and weighting of assessment elements in the module

Element Number	Weighting	Type	Description
1	100%	CWk	Final group presentation

Diagnostic/ formative assessment

This indicates if there are any assessments that do not contribute directly to the final module mark

Further information on assessment

This section provides further information on the module's assessment where appropriate

45 minute of group presentations at the end f the first block. Each student will receive an individual grade

Module Specification

	Basic module information	
1	Module Title:	**Psychological Sports Coaching**
2	Module Code:	M2
3	Credit Points:	9 ECTS
4	Duration: Semester Working Hours (SWH):	14 weeks 2 SWH Lectures; 2 SWH Seminars
5	School:	Faculty of Humanities; S. Schröder
6	Campus:	Otto-von-Guericke University of Magdeburg, Germany
7	Date:	Winter Semester

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title
	Psychology

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Programme Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Module objectives & Skill development**

This module aims to develop the student's ability to:

- adopt various approaches to the study of the coaching process, drawing on literature and current research into areas such as pedagogy, psychology and sociology;
- critically evaluate models of coaching; the social aspects of coaching; the coaching contexts; the role of the coach and others within the coaching process; coaching styles and strategies; leadership skills, the management of the coaching process; and coach education.
- Critically evaluate models of coaching from an interdisciplinary perspective.
- Understand the complex relationships that exist within the coaching process and to know how to best manage these.
- Critically reflect upon strategies and coaching styles employed within the coaching process.
- Understand how to apply the scientific principles behind the coaching process.

- Advanced evaluation of coach education.
- Evaluate available resources within the coaching process and to understand how to manage and best utilise these resources.
- Reflect on values and beliefs and how coach impact on coaching philosophy.
- Analyse the roles of the coach and others within the coaching process and critically reflect upon these roles.
- Operate as a reflective practitioner with an appreciation for, and commitment to, lifelong learning.

11	**Module Content**

- Definitions of coaching in sport
- Models of coaching in psychology, pedagogy and sociology
- Coach roles
- Coach philosophy
- Coaching styles and strategies
- Coach qualities
- Personality of coach
- Contexts of coaching
- The coaching process
- Communication und interaction
- Planning, implementation and evaluation of practical coaching sessions
- Team environment and team culture
- Critical review of contemporary issues – e.g. professionalism, sexism
- Coach education

12	**Indicative Reading**

- Sheldon, K. M. (2014). Becoming oneself: The central role of self-concordant goal selection. *Personality and Social Psychology Review*, *18*(4), 349-365.
- Zagórska, A., & Guszkowska, M. (2014). A program to support self-efficacy among athletes. *Scandinavian journal of medicine & science in sports*, *24*(3), e121-e128.
- Gearity, B. T., & Murray, M. A. (2011). Athletes' experiences of the psychological effects of poor coaching. *Psychology of sport and exercise*, *12*(3), 213-221.
- Turner, M. J., Jones, M. V., Whittaker, A. C., Laborde, S., Williams, S., Meijen, C., & Tamminen, K. A. (2020). Adaptation to psychological stress in sport. *Frontiers in psychology*, *11*, 2199.
- Jones, R., Kingston, K. And Hughes, M. (eds.) (2007). *An Introduction to Coaching.* London: Routledge.
- Panchal, S., & Riddell, P. (2020). The GROWS model: extending the GROW coaching model to support behavioural change. *The Coaching Psychologist*, *16*(2), 12-25.

13	**Teaching and Learning**
	Range of modes of direct contact This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars
	The module will be presented through a series of formal lectures, student-led seminars, discussion groups and field work. Total contact hours: 56
	Range of other learning methods This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research
	Use of on- and off- line learning resources Independent data collection, analysis and evaluation Directed reading Independent research Total non-contact hours: 214

14	**Assessment methods**			
	This indicates the type and weighting of assessment elements in the module			
	Element number	Weighting	Type	Description
	1	100%	CWk	Written report (3,000 words) of field research and evaluation of coach observations
	Diagnostic/ formative assessment This indicates if there are any assessments that do not contribute directly to the final module mark			
	Students will be able to submit plans and revisions of work to tutor for formative feedback.			
	Further information on assessment This section provides further information on the module's assessment where appropriate Coursework for this module will all be submitted by the end of the first teaching block.			

Otto von Guericke University Magdeburg
Institute III - Sport Science

Module Specification

	Basic module information	
1	Module Title:	**Research Methodology and Scientific Writing**
2	Module Code:	M3
3	Credit Points:	12 ECTS
4	Duration: Semester Working Hour (SWH)	14 weeks 2 SWH Lectures l 2 SWH Seminars
5	School:	Faculty of Humanities; K. Rehfeld
6	Campus:	Otto-von-Guericke University of Magdeburg, Germany
7	Date:	Winter Semester

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title
	Statistics

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Programme Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Overview and Aims**

- Comprehensive overview of research methodology to achieve competence and proficiency in the theory and practice to research
- Explore state of the art methods in sport science for different research questions and problems
- Familiarize students with different research subjects and topics in sport science;
- familiarization with the different research database (e.g. PubMed) and journals (rank, impact factors and guideline of suitable journal to the sport sciences domain)
- Develop skills required in statistical analysis and scientific writing (reports, original or review Manuscript, master thesis)
- Understand basic concepts of research and its methodologies
- Identify appropriate research topics, select and define appropriate research problem and parameters
- Assembling of relevant information and critical evaluation of body of literature
- Report about findings scientifically

11	**Module Content**
	This module aims to develop the student's ability to: • Familiarize with different study designs, validated and reliable measurements and organize own projects to apply theoretical knowledge into practice • Distinguish between high-performance sport, health sport, rehabilitation and leisure sport and conducted methods • Conduct systematic literature review and write a systematic review paper or write a state of-the-art section for an original article • Acquire knowledge of various domains in sport science and propose research questions and hypothesis • Learn how to deal with the collected data (explain statistical procedure and results interpretation + applications).

12	**Indicative Reading**
	• Creswell, J. W. & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE. • Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of Behavioral Research* (4th ed.). Harcourt College Publishers. • Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). SAGE. • Booth, W. C., Colomb, G. G., & Williams, J. M. (2016). *The Craft of Research* (4th ed.). University of Chicago Press • Hart, C. (2018). *Doing a Literature Review: Releasing the Research Imagination* (2nd ed.). SAGE. • Ridley, D. (2012). *The Literature Review: A Step-by-Step Guide for Students* (2nd ed.). SAGE. • Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). SAGE. • Yin, R. K. (2018). *Case Study Research and Applications* (6th ed.). SAGE. • Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics* (5th ed.). SAGE. • Gravetter, F. J., & Wallnau, L. B. (2020). *Statistics for the Behavioral Sciences* (11th ed.). Cengage. • Day, R. A., & Gastel, B. (2012). *How to Write and Publish a Scientific Paper* (7th ed.). Cambridge University Press. • Glasman-Deal, H. (2020). *Science Research Writing: A Guide for Non-Native Speakers of English* (2nd ed.). World Scientific. • American Psychological Association. (2020). *Publication Manual of the American Psychological Association* (7th ed.). • Lipson, C. (2011). *Cite Right: A Quick Guide to Citation Styles* (2nd ed.). University of Chicago Press

13	**Teaching and Learning** *Range of modes of direct contact* This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars	
	The module will be presented through a series of formal lectures, students-led seminars and discussion in groups	
	Total contact hours:	56
	Range of other learning methods This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research	

Use of on- and off- line learning resources

Independent data collection, analysis and evaluation

Directed reading

Independent research

Total non-contact hours:	304

14 **Assessment methods**

This indicates the type and weighting of assessment elements in the module

Element number	Weighting	Type	Description
2	100%	CWk	Written report (5,000 words), individual work

Diagnostic/ formative assessment

This indicates if there are any assessments that do not contribute directly to the final module mark

Students will be able to get revisions within the seminars to be best prepared for the scientific report

Further information on assessment

This section provides further information on the module's assessment where appropriate

Coursework for this module will be submitted by the end of the first teaching block.

Otto von Guericke University Magdeburg
Institute III - Sport Science

Module Specification

	Basic module information	
1	Module Title:	**The Sport Scientist**
2	Module Code:	M4
3	Credit Points:	9 ECTS
4	Duration: Semester Working Hours (SWH):	14 weeks 2 SWH Lectures; 2 SWH Seminars
5	School:	Sports Sciences, Exercise and Health; Prof. Dr. Jaime Sampaio
6	Campus:	Universidade De Trás-Os-Montes E Alto Douro, Vila Real, Portugal
7	Date:	Summer Semester

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Program Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Module objectives & Skill development**

- Acquire a clear view of the professional opportunities related to the role of the sports scientist.
- Develop a model of performance that embraces complexity and holism.
- Describe the dynamics of modern sports organizations considering the incorporation of new professionals and new technology.
- Experience several management systems and understand the complementary nature of quantitative and qualitative methods towards the aim of personalized training.

11	**Module Content**
	The module content will include: • History and evolution of the sports scientist career. • Complexity and creativity as contributors to model performance. • Integration in sport organisations. • Athlete management systems. • Real-life experiences of the sport scientist and future trends

12	**Indicative Reading**
	• French, D & Torres-Ronda, L. (Eds), 2021, NSCA's Essentials of Sports Science. Human Kinetics, Champaign, Illinois. • Winkelman, N., 2021, The Language of Coaching. Human Kinetics, Champaign, Illinois. • O'Donoghue, P. McGarry, T. & Sampaio, J., 2013, Routledge Handbook of Sports Performance Analysis. Routledge, London.

13	**Teaching and Learning**
	Range of modes of direct contact This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars
	The teaching methods will centre around a blended learning approach and include: Lectures, seminars, discussion forums (including face-to-face and on-line), NOW-based exercises, invited guest speakers, laboratory and practical work. Total contact hours: 56
	Range of other learning methods This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research
	Students will be expected to engage in additional learning which may involve, for example, the following activities: • Directed reading. • Independent learning and research project. • Experiential learning (supporting consultancy projects & associated coaching briefs). • Reflective practice. Total non-contact hours: 214

14 **Assessment methods**

This indicates the type and weighting of assessment elements in the module

Element number	Weighting	Type	Description
1	50%	CWk	Group presentation (30min)
2	50%	CWk	Group written report (15 pages)

Diagnostic/ formative assessment

This indicates if there are any assessments that do not contribute directly to the final module mark

Group presentation:

Evaluation methods: Overall structure of the presentation, presentation of the key issues of the coaching process, discussion of the coaching process, presentations skills, quality of slights

Written report:

Evaluation methods: clarity goal, topic, structure, selection and processing of references, theoretical background and own judgements, terminology, research methodology, presentation of results, discussion of results, layout

Further information on assessment

This section provides further information on the module's assessment where appropriate

The emphasis of Advanced Topics in Notational Analysis is to develop a comprehensive and critical understanding of the principles and processes behind notational analysis. This module represents a holistic approach to performance analysis e.g. exposure to processes, theory and communication training, thereby maximising student employability for the future. Specifically, students will develop not only the capacity to apply the principles taught to a variety of contexts, but will also be able to deliver the information in the most appropriate and conducive format.

Coursework for this module will all be submitted by the end of the second teaching block.

Module Specification

	Basic module information	
1	Module Title:	**Field and Laboratory Technology**
2	Module Code:	M5
3	Credit Points:	9 ECTS
4	Duration: Semester Working Hours (SWH)	14 weeks 2 SWH Lectures; 2 SWH Seminars
5	School:	Sports Sciences, Exercise and Health; Prof. Dr. Catarina Abrantes
6	Campus:	Universidade De Trás-Os-Montes E Alto Douro, Vila Real, Portugal
7	Date:	Summer Semester

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Programme Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Module objectives & Skill development**

Students must understand, explore and develop topics related to advances in sport technology in a supervised laboratory and field context, which will allow them to acquire autonomous skills and knowledge in this area. Thus, it is intended that students are specifically able to:

- Critically evaluate recent advances in sport technology, and specifically, performance analysis technology from an interdisciplinary perspective.
- Understand the recent advances in laboratory technology and integrate them into the sports scientist role (physiological and biochemical testing).
- Understand the recent advances in field technology and integrate them into the sports scientist role (physical, positional and physiological).
- Experience the complete process of data collection, processing, visualization and communication to the coaching staffs.

11	**Module Content**
	The module content will include: • Evolution and implementation of field and laboratory technology. • Physiological and biochemical testing in laboratory settings. • Global positioning systems and local positioning measurement systems. • Positioning, technical-tactical performance variables. • Load monitoring and performance optimisation applied to the high-level and developmental athlete. • Real-life experiences of the sport scientist and future trends.

12	**Indicative Reading**
	• Joyce, D. & Lewindon, D. (Eds, 2nd ed), 2021, High Performance Training for Sports, Human Kinetics, Champaign, Illinois. • French, D & Torres-Ronda, L. (Eds), 2021, NSCA's Essentials of Sports Science. Human Kinetics, Champaign, Illinois. • O'Donoghue, P. McGarry, T. & Sampaio, J., 2013, Routledge Handbook of Sports Performance Analysis. Routledge, London.

13	**Teaching and Learning**	
	Range of modes of direct contact This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars	
	Presentation of contents with traditional and technological resources: Hybrid teaching, where a more expository strategy is combined with access to online research; Problem based learning; Use of on- and off-line learning resources; Review of theoretical approaches; Review of current research; Empirical research and data collection; Digital mind maps; Learning snacks	
	Total contact hours:	56
	Range of other learning methods This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research	
	Total non-contact hours:	214

14 **Assessment methods**

This indicates the type and weighting of assessment elements in the module

Element number	Weighting	Type	Description
1	50%	CWk	Group presentation (30min.)
2	50%	CWk	Written report

Diagnostic/ formative assessment

This indicates if there are any assessments that do not contribute directly to the final module mark

Further information on assessment

This section provides further information on the module's assessment where appropriate

The emphasis of Applied Performance Analysis is to develop the practical skills and competencies that will make you an effective practitioner. Furthermore, the breadth of experiences afforded will enhance employability opportunities across numerous sectors of professional sport. To this end, assessment is focused on task accomplishment that will provide robust foundation to working in the area of performance analysis and athlete support and enhancement. This is a highly practical module and much of the assessment will be practical based.

Coursework for this module will all be submitted by the end of the second teaching block.

Otto von Guericke University Magdeburg
Institute III - Sport Science

Module Specification

	Basic module information	
1	Module Title:	**Applied Performance Analysis**
2	Module Code:	M6
3	Credit Points:	12 ECTS
4	Duration: Semester Working Hours (SWH):	14 weeks 2 SWH Lectures; 2 SWH Seminars
5	School:	Sports Sciences, Exercise and Health; Prof. Dr. Nuno Leite
6	Campus:	Universidade De Trás-Os-Montes E Alto Douro, Vila Real, Portugal
7	Date:	Summer Semester

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Programme Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Module objectives & Skill development**

- Provide strong practical competencies in numerous performance analysis systems, specifically, those designed for match, motion and technique analysis.
- Provide a unique opportunity for students to gain sufficient experience to demonstrate autonomy across a number of computerized software packages.
- Enhance the student's ability to develop and critically appraise analytical systems across a variety of sports.
- Develop the capacity to synthesize and interpret large quantitative data sets using advanced statistical techniques.

The emphasis of Applied Performance Analysis is to develop the practical skills and competencies that will make you an effective practitioner.

Furthermore, the breadth of experiences afforded will enhance employability opportunities across numerous sectors of professional sport. To this end, assessment is focused on task accomplishment that will provide robust foundation to working in the area of performance analysis and athlete support and enhancement.
This is a highly practical module and much of the assessment will be practical based.

11	**Module Content**
	• The coaching process and Performance Analysis Workflows • Data capture of discrete and continuous variables • Applied sports analytics and data visualisation processes • Simulated and real case studies

12	**Indicative Reading**
	• Sampaio, J. & Leite, N. (2012). Performance indicators in game sports. In: T. McGarry, O'Donoghue & J. Sampaio (Eds.): Routledge Handbook of Sports Performance Analysis (pp. 115-126). Routledge, London. • Hughes, M. & Franks, I. (Eds), 2019 Essentials of Performance Analysis in Sport. Routledge, London. • Carling, C., Reilly T. & Williams, A. M. (2009) Performance Assessment for Field Sports: Physiological, • Psychological and Match Notational Assessment in Practice. Routledge, London.

13	**Teaching and Learning** *Range of modes of direct contact* This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars
	The module will be presented through a series of lectures and formal tutorials that will be supplemented by seminars, practical laboratory classes, and presentations, and guided independent study. Total contact hours: 56
	Range of other learning methods This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research
	Use of on- and off-line learning resources; Review of theoretical approaches; Review of current research; Directed reading; Empirical research and data collection; Round table discussions; Digital mind maps; Multiple choice tests; Learning snacks; Power point presentations Total non-contact hours: 304

14 **Assessment methods**

This indicates the type and weighting of assessment elements in the module

Element number	Weighting	Type	Description
1	30%	CWk	Group presentation (60min.)
2	70%	CWk	Original Research paper

Diagnostic/ formative assessment

This indicates if there are any assessments that do not contribute directly to the final module mark

Group presentation:
Evaluation methods: presentation of the key issues of the literature, identification of the limitations and future directions, presentations skills

Original research paper:
Evaluation methods: Presentation of the individual research project; clarity of goal/topic, structure, selection and processing of references, theoretical background and own judgements, terminology, research methodology, presentation of results, discussion of results, layout

Module Specification

	Basic module information	
1	Module Title:	**Injury Prevention & Mechanical Load**
2	Module Code:	M7
3	Credit Points:	9 ECTS
4	Duration: Semester Working Hours (SWH)	14 weeks 2 SWH Lectures; 2 SWH Seminars
5	School:	Lithuanian Sports University; Prof. Dr. Danguole Satkunskiene
6	Campus:	Kaunas, Lithuania
7	Date:	Winter Semester

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Programme Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Module objectives & Skill development**

- Assess mechanical load patterns and biomechanics in athletic movements, including weight lifting, walking-running, jump-landing, and integrated sports skills.
- Interpret and predict potential implications of pathomechanics on injury and performance.
- Critically discuss tissue response to load and the implications of athletic technique on load and injury.
- Perform research on the biomechanical properties of muscles and tendons, analyse and interpret the results

11	**Module Content**

Analysis of statics and dynamics posture and joint alignment:

- 2D and 3D video recording (Contemplas, SIMI motion, IMU sensors)
- 2D and 3D angle calculation (Kinovea, Tracking, SIMI, Noraxon)
- Posture evaluation; interpretation of the data.

Analysis of mechanical external and internal load in weight lifting, running and jumping:

- Videorecording, body modeling, free body diagrams, inverse dynamics method.
- Recording of ground reaction force, force plate, impact force, direct dynamics method.

Mechanical properties of soft tissues and injury prevention:

- Muscles, tendons, ligaments structure and their mechanical properties: stiffness, elasticity, viscosity.
- Mechanical factors affecting risk of injury.
- Connective tissue adaptation to mechanical training loads.

Analysis of muscle and tendon morphology, stiffness and viscoelasticity:

- Ultrasonography for muscle and tendon morphology analysis,
- Dynamometry (Isokinetic dynamometer Biodext) for stiffness and viscoelasticity analysis.

12	**Indicative Reading**

- Edwards, W. B. (2018). Modeling overuse injuries in sport as a mechanical fatigue phenomenon. Exercise and sport sciences reviews, 46(4), 224-231.
- Kalkhoven, J. T., Watsford, M. L., & Impellizzeri, F. M. (2020). A conceptual model and detailed framework for stress-related, strain-related, and overuse athletic injury. Journal of science and medicine in sport, 23(8), 726-734.
- Mersmann, F., Bohm, S., & Arampatzis, A. (2017). Imbalances in the development of muscle and tendon as risk factor for tendinopathies in youth athletes: a review of current evidence and concepts of prevention. Frontiers in physiology, 8, 987.
- Lorimer, A.V. and Hume, P.A., 2016. Stiffness as a risk factor for achilles tendon injury in running athletes. Sports Medicine, 46(12), pp.1921-1938.
- Gabbett, T.J., 2016. The training-injury prevention paradox: should athletes be training smarter and harder?. Br J Sports M Gabbett, T.J., 2016. The training-injury prevention paradox: should athletes be training smarter and harder? Br J Sports Med, pp.bjsports-2015.ed, pp.bjsports-2015.

13 **Teaching and Learning**

Range of modes of direct contact

This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars

Formal lectures, practical exercises, laboratory sessions and workshops;

Total contact hours: 56

Range of other learning methods

This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research

On and off line learning resources, independent data collection, analysis and evaluation, directed reading and independent research.

Total non-contact hours: 214

14 **Assessment methods**

This indicates the type and weighting of assessment elements in the module

Element number	Weighting	Type	Description
1	40%	CWk	Written report of laboratory work
2	20%	CWk	Oral presentation
3	40%	CWk	Written Examination

Diagnostic/ formative assessment

This indicates if there are any assessments that do not contribute directly to the final module mark

Module Specification

	Basic module information	
1	Module Title:	**Applied Research Methodology**
2	Module Code:	M8
3	Credit Points:	9 ECTS
4	Duration: Semester Working Hours (SWH):	14 weeks 2 SWH Lectures; 2 SWH Seminars
5	School:	Lithuanian Sports University; Prof. Dr. Marius Brazaitis
6	Campus:	Kaunas, Lithuania
7	Date:	Winter Semester

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title
	none

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Programme Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Module objectives & Skill development**

- Introduce the students with the most advanced testing technologies for the athletic physical and mental performance.
- Define, explain, and demonstrate the most advanced testing paradigms involved in physiological and mental performance of the athlete.
- Present principles surrounding the design of the athletic periodical testing that are specific to appropriate sports/physical activity fields.
- Develop further students' empirical assessment toolkit and increase students' capacity to act (decision-making) independently in their relevant field.
- Analyze, interpret, and link the testing results with the most advanced and relevant fundamental and applied research evidence within their field.

11	**Module Content**
	Physiology in Sport Performance. Advanced testing in Sport Performance: • Testing aerobic capacity (VO2max) of the athlete; • Testing glycolytic (anaerobic) capacity (Wingate test) of the athlete; • Testing cognitive (ANAM) function of the athlete; • Testing hemodynamic (fNIRS) kinetics in the athlete's brain during decision-making task; • Testing cortex arousal state (EEG) of the athlete; • Testing neuromuscular function (components of muscle torque production) of the athlete; • Testing neural drive (TMS, EMG, electrical stimulator) to exercising muscle capacity of the athlete; • Testing reactivity capacity of the athlete. Testing design: • Structure of periodical athlete testing. • How to select the right test for athletic problem identification. Collection and reporting of data: • Testing device software; • Data recognition and collection; • Analysis of direct outcome; • Interpretation of results and conclusions

12	**Indicative Reading**
	• Tanner, R., Gore, C. (2012). Physiological Tests for Elite Athletes. 2nd Ed. Champaign, Ilinois: Human Kinetics. • Bompa, T.O., Buzzichelli, C. (2021). Periodization of Strength Training for Sports-4th Edition. Champaign, Ilinois: Human Kinetics. • Aagaard, P., Simonsen, E.B., Andersen, J.L., Magnusson, P., Dyhre-Poulsen, P. (2002). Neural adaptation to resistance training: changes in evoked V-wave and H-reflex responses. Journal of Applied Physiology 92 (6), 2309-2318. • Skurvydas, A., Jurgelaitiene, G., Kamandulis, S., Mickeviciene, D., Brazaitis, M., Valanciene, D., Karanauskiene, D., Mickevicius, M., Mamkus, G. What are the best isometric exercises of muscle potentiation? Eur J Appl Physiol. 2019 Apr;119(4):1029-1039. • Bernecke, V., Pukenas, K., Daniuseviciute, L., Baranauskiene, N., Paulauskas, H., Eimantas, N., Brazaitis, M. Sex-specific reliability and multidimensional stability of responses to tests assessing neuromuscular function. Homo. 2017 Dec;68(6):452-464. • Budde H, Schwarz R, Velasques B, Ribeiro P, Holzweg M, Machado S, Brazaitis M, Staack F, Wegner M. The need for differentiating between exercise, physical activity, and training. Autoimmun Rev. 2016 Jan;15(1):110-1. • Bernecke V, Pukenas K, Imbrasiene D, Mickeviciene D, Baranauskiene N, Eimantas N, Brazaitis M. Test-Retest Cross-Reliability of Tests to Assess Neuromuscular Function as a Multidimensional Concept. J Strength Cond Res. 2015 Jul;29(7):1972-84.

13 **Teaching and Learning**

Range of modes of direct contact

This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars

Formal lectures, practical exercises, laboratory sessions and workshops.

Total contact hours: 56

Range of other learning methods

This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research

On and off-line learning resources, independent data collection, analysis and evaluation, directed reading and independent testing.

Total non-contact hours: 214

14 **Assessment methods**

This indicates the type and weighting of assessment elements in the module

Element number	Weighting	Type	Description
1	100%	CWk	Four oral group presentations (25% each)

Diagnostic/ formative assessment

This indicates if there are any assessments that do not contribute directly to the final module mark

Module assessment will navigate student towards strengthened practical capabilities to perform high quality measurements of athlete performance. The acquired skills during the module will help the student to successfully complete the final thesis. Students will be supported and guided in shaping their interpretation linking testing data to physiological processes through tutorials and seminars. The oral presentation will provide opportunity for the student to work in the group and to link testing results with specific literature in the field, evaluating the key touch points and opportunities of used testing specificity in athlete field testing. Moreover, the oral presentation gives opportunity for open discussion and further evaluation of student’s comprehension and understanding of the testing meaningfulness.

Further information on assessment

This section provides further information on the module’s assessment where appropriate

Module Specification

	Basic module information	
1	Module Title:	**Biomechanical Analysis of Sport Techniques**
2	Module Code:	M9
3	Credit Points:	12 ECTS
4	Duration: Semester Working Hours (SWH):	14 weeks 2 SWH Lectures; 2 SWH Seminars
5	School:	Lithuanian Sports University; Prof. Dr. Danguole Satkunskiene
6	Campus:	Kaunas, Lithuania
7	Date:	Winter Semester

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title
	none

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Programme Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Module objectives & Skill development**

- Develop a critical understanding of the theoretical basis of sport biomechanics analysis.
- Perform quantitative and qualitative analysis of sport performance biomechanics; critically evaluate techniques used in motion analysis.
- Evaluate information gathered to provide constructive feedback to coaches, athletes and researches for technique improvement and injury prevention
- Plan, execute and present scientific research, apply a range of computer programs and computer devices and be familiar with modern electronic systems.
- Apply a range of computer programs and computer devices and be familiar with modern electronic systems;
- Evaluate information gathered to provide constructive feedback to coaches, athletes and researches for technique improvement and injury prevention.

11	**Module Content**

Biomechanical approach on analysing sport performance

Instrumentation and techniques in biomechanics applied to sports:

- 2D and 3D kinematics (video recording: Contemplas (2D), SIMI motion (3D); 3D Inertial Motion Capture (Noraxon) and other instruments based on IMU technology)
- Force plate (BTS Podium, AMTI) application for athletes testing and performance analysis.
- EMG (Noraxon) application for athletes testing and performance analysis.

Processing and analysis of biomechanical data. Feedback and instructions to coaches and athletes.

Biomechanical analysis of selected sport technique.

12	**Indicative Reading**

- Bartlett, R. & Bussey, M. (2013). Sports biomechanics: reducing injury risk and improving sports performance. Routledge.
- Caldwell, G., Hamill, J., Kamen, G. et al. (2004) Research Methods in Biomechanics. Human Kinetics. Campaign, Illinois.
- Glazier, P., Davids, K. & Bartlett, R. (2003). Dynamical systems theory: a relevant framework for performance¬ oriented sports biomechanics research. Sportscience, 7 (retrieved from sportsci. org/jour/03/psg. htm).
- O'Donoghue (2010) Research methods for sports performance analysis / Peter O'Donoghue. -- London : Routledge, 278 p. :
- Payton, C. & Bartlett, R. (Eds.). (2007). Biomechanical evaluation of movement in sport and exercise: the British Association of Sport and Exercise Sciences guide. Routledge.

13 **Teaching and Learning**

Range of modes of direct contact

This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars

Formal lectures, practical exercises, laboratory sessions and workshops;

Total contact hours: 56

Range of other learning methods

This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research

On and off line learning resources, independent data collection, analysis and evaluation, directed reading and independent research

Total non-contact hours: 304

14 **Assessment methods**

This indicates the type and weighting of assessment elements in the module

Element number	Weighting	Type	Description
1	70%	CWk	Individual project
2	30%	CWk	Oral presentation

Diagnostic/ formative assessment

This indicates if there are any assessments that do not contribute directly to the final module mark

Further information on assessment

This section provides further information on the module's assessment where appropriate

Coursework for this module will all be submitted by the end of the third teaching block.

Otto von Guericke University Magdeburg
Institute III - Sport Science

Module Specification

	Basic module information	
1	Module Title:	**Scientific Applied Work Placement**
2	Module Code:	M10
3	Credit Points:	10 ECTS
4	Duration:	12 weeks
5	School:	
6	Campus:	
7	Date:	February

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title
	IMPAS Modules 1-9

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Programme Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Module objectives & Skill development**

The main aims of this specialised module are to skill students in their capacity to apply theory to practice, specifically within an industry-based and research-based settings. Drawing on knowledge and understanding gained through taught modules, students will be based within a setting offering scientific support to athletes and coaches, persons undergoing rehabilitation procedures, individuals with special needs for movement, and other. In addition to applying theory to practice, students will develop transferable skills, such as team-work, communication, task-deadline accomplishment and professional work ethic. Work placement opportunities may well take place in clubs, organisation and/or federations, rehabilitation centers, research institutes and laboratories, and similar. It may be that placements are hosted within academic institutions working alongside practitioners who offer sport science support and performance analysis to their elite teams. This module aims to enhance the students' employability and career preparation by developing a range of both subject-specific and key transferable skills.

- Evaluate suitable and innovative methodologies designed to improve an individual's analytical capacity.
- Plan, design and execute assessment of human performance.
- Demonstrate theoretical underpinning to the application of practical techniques and solutions for the monitoring, analysis and evaluation of performance analysis of sport.
- Evaluate the link between applied sport science and the coaching process for enhancement of athletic performance.

Skills, qualities and attributes. After studying this module you should be able to:
- Use appropriate methodologies in the analysis and interpretation of data obtained in performance analysis of sport.
- Develop innovative and creative methodologies for the capture of human movement.
- Undertake safe and effective laboratory and field work.
- Demonstrate vocationally relevant performance analysis skills.
- Communicate effectively in a manner that influences an athlete(s) performance and the coaching process.
- Demonstrate transferable skills expected by industry of performance analyst.

11	**Module Content**
	Students on this module will spend time working within and alongside sports clubs, companies, associations, research laboratories, etc. Involved with delivery of applied work in area of sport and movement science. Time will be spent in preparing students for placement, such as placement-host agreements, pre-placement introduction seminars, health and safety arrangements, key contact details, etc.

12	**Indicative Reading**
	□ Parker, C. (2001) 101 Communication Tips for Managers; Handbook of Communication. Institute of Leisure and Amenity Managers, UK

13	**Teaching and Learning**
	Range of modes of direct contact This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars
	Student learning will take place in the form of "on-the-job" training at host organisation. Students' will be mentored by experienced staff in field of performance analysis and will shadow staff within the organisation supporting them in their role. It would be expected that students demonstrate autonomy in their working within set, and agreed, boundaries. Total contact hours: 10
	Range of other learning methods This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research

Use of on- and off- line learning resources

Independent data collection, analysis and evaluation

Directed reading

Independent research

Total non-contact hours: 290

14 **Assessment methods**

This indicates the type and weighting of assessment elements in the module

Element number	Weighting	Type	Description
1	100%	CWk	Written report – evaluation of the placement experience, capturing work undertaken, critique of application of theory to practice.

Diagnostic/ formative assessment

This indicates if there are any assessments that do not contribute directly to the final module mark

Students will be supported throughout their placement period by their tutor and/or programme leader. Discussion points, through online-meetings, e-mail, etc. Can occur throughout the placement. Drafts of written report can be submitted for formative feedback to the placement tutor.

Further information on assessment

This section provides further information on the module's assessment where appropriate

Coursework for this module will all be submitted by the end of your second year of study. Placements may be undertaken outside the country in which you are registered to study. Your primary supervision team will be academic staff from your home university.

Otto von Guericke University Magdeburg
Institute III - Sport Science

Module Specification

	Basic module information	
1	Module Title:	**Research Project / Master Thesis**
2	Module Code:	M11
3	Credit Points:	20 ECTS
4	Duration:	20 weeks
5	School:	
6	Campus:	
7	Date:	May

8 **Recommended pre-knowledge:**

These are modules that you should have studied previously in order to take this module

Module Code	Module Title
	IMPAS Modules 1-9

9 **Programmes containing the module**

Level	Core/Option	Mode	Code	Programme Title
M	C	FT		International M.Sc. in Performance Analysis of Sport

10 **Overview and Aims**

This module aims to provide students with the opportunity to:

- explore and critically analyse current issues at the forefront of a particular area of performance analysis;
- conduct independent research that is unique and forward-thinking in a particular area of performance analysis;
- undertake and evaluate complex issues in a systematic and creative way for the purpose of hypothesis testing;
- develop excellent time management skills as required for their intended professional discipline;
- prepare work for possible presentation their research in a peer-reviewed environment (e.g., conference, journal).
- Demonstrate a systematic understanding of knowledge and critical awareness of the issues at the forefront of performance analysis;
- Review research that is unique and forward-thinking in a particular area of performance analysis.

Skills, qualities and attributes. After studying this module you should be able to:

- Deal with complex issues in a systematic and creative way and show originality in

solving problems;
- Analyse and communicate the findings of current performance analysis research in written format;
- Show sound judgement, personal responsibility and initiative;
- Produce an individual and substantial piece of independent work to specific timescales.

11	**Module Content**
	At the beginning of the module, students will be provided with a comprehensive introduction of relevant steps and documents for taking the master thesis. This will provide background knowledge required to undertake the dissertation successfully. Students are encouraged to identify areas for research and consult with a member of academic staff to shape concepts in to a feasible, and achievable, research proposal. Under the guidance of the Supervisor, each student will critically evaluate literature relevant to the research topic; undertake a period of empirical data collection; analyse and evaluate findings; and present a written thesis in addition to preparing for an oral presentation of the thesis with open question defence.

12	**Indicative Reading**
	Students will be expected to source information from peer reviewed, primary information resources. Additionally, secondary sources of information may be consulted (relevant textbooks, etc.). Other resources may also be suitable for supporting project development and statistics; such as: • Thomas, J.R.; Nelson, J.K. (2005). *Research methods in physical activity*. 5th Ed. Champaign, Illinois: Human Kinetics. • Vincent, W.J. (2005). Statistics in kinesiology. 3rd Ed. Champaign, Illinois, Human Kinetics.

13	**Teaching and Learning**
	Range of modes of direct contact This indicates the range of direct contact teaching and learning methods used on this module, e.g. lectures, seminars
	Students will embark on a piece of independent research, showing autonomy in working, capacity to meet specified deadlines, ability to implement effective time management skills, along with record-keeping skills. Each student will be assigned a suitable member of academic staff to oversee and supervise the research project, however there needs to be maintained a level of independence by the student. Supervisory meetings will be arranged as and when necessary and appropriate. Total contact hours: 8
	Range of other learning methods This indicates the range of other teaching and learning methods used on this module, e.g. directed reading, research
	Use of on- and off- line learning resources Independent data collection, analysis and evaluation Directed reading Independent research Total non-contact hours: 592

14	**Assessment methods**			
	This indicates the type and weighting of assessment elements in the module			
	Element number	Weighting	Type	Description
	1	100%	CWK	A) Written thesis (70%) ca. 15,000 words B) Oral presentation of the thesis including questions and answers (30%)
	Diagnostic/ formative assessment This indicates if there are any assessments that do not contribute directly to the final module mark			
	Written proposal outlining the aims, objectives, methodologies including experimental design and data analysis will be reviewed. Regular supervisory meetings will provide opportunity to monitor progress and developments, discuss emerging issues and share good practice.			
	Further information on assessment This section provides further information on the module's assessment where appropriate Coursework for this module will all be submitted within the second year of study. It is expectant that the research project will take in the region of 5 months to complete. Research projects can be undertaken at IMPAS partner universities (UTAD, LSU) or in other facilities as outlined in SPO. However, your primary supervisory team, consisting of IMPAS teaching staff, will be based at OVGU Institute III - Sport Science in which you are registered to study.			