

HUMAN KINETICS AND ERGONOMICS

Introduction to Ergonomics
&
Ergonomics Programmes

2024 Short Course



RHODES UNIVERSITY
Where leaders learn

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Introduction to Ergonomics and Ergonomics Programmes Short Course

General Background to the Ergonomics Training Series

The Human Kinetics and Ergonomics (HKE) Department at Rhodes University is currently the sole provider of undergraduate and postgraduate ergonomics education in South Africa. Furthermore, the staff in the HKE department are intrinsically involved in ergonomics within both the South African and the international ergonomics community. Therefore, the Department believes it plays an important role in providing suitable ergonomics training to practitioners who, as part of their duties, must ensure company compliance with the newly promulgated Ergonomics Regulations.

Since 2015, the HKE Department has trained numerous practitioners in ergonomics in the “Certificate in Ergonomics” short course, including inspectors from the Department of Employment and Labour, staff from the Gauteng Department of Health, fellow academics, and practitioners from a variety of industries. Since the announcement of the promulgation of the Ergonomics Regulations in December 2019, interest in ergonomics training has increased considerably, and this has prompted the HKE Department to restructure its ergonomics training short course, to a) be responsive to the Ergonomics Regulations, and b) be more accessible in terms of time and money available for a wide range of industries (i.e. SMME’s to large corporations).

It is however vital that the ergonomics short courses on offer fulfil the university’s policy requirements for short courses, and that the contents of the reworked ergonomics training courses remain aligned with the educational knowledge required by the Professional Affairs Board (PAB) of the Ergonomics Society of South Africa (ESSA) and its certification criteria. In short, the reworked version of the former “Certificate in Ergonomics” covers the same content as the course offered previously, but in a different format, in order to offer greater accessibility and flexibility for course participants.

The short course “Level 1 Ergonomics Assessment and Controls” is the second course in the series of 4 training courses offered by HKE Department (refer to Table I). Furthermore, the Department offers the opportunity to perform self-directed project work under the guidance of the course facilitator to gain practical experience. Together, these courses provide a framework of knowledge covering the breadth of ergonomics risk assessment, introduction to physical and cognitive ergonomics, and the hierarchy of controls, and will provide a suitable level of education for participants intending to register as Certified Ergonomics Associate (CEA) with the Professional Affairs Board of the Ergonomics Society of South Africa.

Table 1: Overview of ergonomics training courses offered by the HKE Department

	Short Course	Nature of Module	Requirements	Duration	Total Hours
1	Introduction to Ergonomics and Ergonomics Programmes	Online	<ul style="list-style-type: none"> • 60 hrs Theory • 20 hrs Project 	2 Months <ul style="list-style-type: none"> • Expectation of 10hrs per week 	80
2	Level 1 Ergonomics Risk Assessment and Controls	Blended Learning *	<ul style="list-style-type: none"> • 20 hrs Theory • 20 hrs Practicals • 20 hrs Project 	3 Weeks <ul style="list-style-type: none"> • 2 weeks Online • 1 week Face-to-Face 	60
3	Level 2 Ergonomics Assessment of Physical Work	Blended Learning *	<ul style="list-style-type: none"> • 30 hrs Theory • 20 hrs Practicals • 30 hrs Project 	1 Month <ul style="list-style-type: none"> • 3 weeks Online • 1 week Face-to-Face 	80
4	Level 2 Ergonomics Assessment of Cognitive Work	Blended Learning *	<ul style="list-style-type: none"> • 30 hrs Theory • 20 hrs Practicals • 30 hrs Project 	1 Month <ul style="list-style-type: none"> • 3 weeks Online • 1 week Face-to-Face 	80
5	Ergonomics Project	Online	<ul style="list-style-type: none"> • 60 hrs Project 	2 Months <ul style="list-style-type: none"> • Online activities and self-directed work under supervision 	60

** Blended learning refers to a combination of online and face-to-face activities*

Course Principles

This course makes use of an active and experiential approach to learning, and is based on the principles of applied learning and reflective learning. It is necessary to first understand theoretical concepts and be able to apply these to one's own working environment before performing any practical ergonomics activities. Reflective learning is based on Deming's Plan-Do-Check-Act cycle, and allows participants to take ownership of their learning process.

Course Description

The purpose of the course "Introduction to Ergonomics and Ergonomics Programmes" is two-fold. Firstly, to provide an introduction to the theoretical principles of Ergonomics (also referred to as "Human Factors") and the socio-technical systems approach to design for the human user, while keeping human capabilities and limitations in mind. Particular emphasis is placed on the practice of Human Factors and Ergonomics in a Southern African context. Secondly, the course provides an overview on Ergonomics Programmes in relation to the Ergonomics Regulations recently promulgated. This course provides participants with vital knowledge in the theory of ergonomics and the code of conduct and to ensure that participants have a sound understanding of how to ensure that ergonomics programmes are successfully implemented and highlight some of the key barriers to success.

Course Outline

Table II provides an overview of the topics covered in this course, how they are aligned with the CEA certification criteria put forward by the ESSA PAB and how the 80 hours that make up this course are allocated:

Table II: Topics covered in the “Introduction to Ergonomics and Ergonomics Programmes” course and the time allocation towards ESSA PAB requirements.

Topic	Content	Time allocation and PAB criteria
General Principles of Ergonomics	<ul style="list-style-type: none"> History of work and the discipline of Human Factors and Ergonomics Overview of Ergonomics: definition, scope, aims, objectives and benefits of ergonomics. Outcomes of poor ergonomics (ergonomics risks) 	Ergonomics Approach (12 hrs)
Ergonomics in South Africa	<ul style="list-style-type: none"> Industrially advanced vs. industrially developing countries Considerations of Ergonomics in the South African context 	
Systems of work	<ul style="list-style-type: none"> Introduction to systems theory Interfaces between work, humans and the environment 	Systems theory (3 hrs)
Human Characteristics	<ul style="list-style-type: none"> Human variability The global and South African-specific workforce – considerations of work capabilities, health and wellness How to assess worker capabilities Fitting the task to the human operator Physical, physiological, psychological and cognitive characteristics Considerations of the physical environment and its impact on work 	Human Characteristics (20 hrs)
Ergonomics Advocacy	<ul style="list-style-type: none"> “Selling Ergonomics” Legislative Considerations Ergonomics Regulation Engagement Cost-Benefit Analysis 	Health, Safety and Wellbeing (4 hrs)
Ergonomics Programmes	<ul style="list-style-type: none"> Developing an Ergonomics Programme Participatory Ergonomics Needs Analysis Ergonomics Training and ILO Ergonomics Checkpoints 	Methods of Measurement and Investigation (6 hrs) Training & Instruction (5hrs)
Ergonomics Programme Evaluation	<ul style="list-style-type: none"> Continuous Improvement Outcome Assessment Ergonomics Maturity Ladder Professional Issues and Ethical Conduct ESSA Discussion 	Workplace Design (3 hrs) Work Organisation Design (3 hrs)
Applications	<ul style="list-style-type: none"> Examples from various industrial sectors Applied Project 	People and Technology (4 hrs) Applications (20hrs)
TOTAL		80 hours

Intended Learning Outcomes

At the end of this course, participants should:

- Understand the fundamental principles of Human Factors and Ergonomics
- Understand the relevance of ergonomics in a Southern African context and in comparison, to industrially advanced countries
- Describe the basic principles of human anatomy, physiology, biomechanics, anthropometry and human information processing
- Appreciate that there are individual differences between persons within a work environment
- Understand how knowledge about human characteristics allows issues in task design to be understood from an ergonomics perspective.
- Apply this theoretical knowledge to a variety of working contexts.
- Communicate the beneficial nature of Ergonomics including cost-benefit characteristics and the systems approach
- Develop and evaluate an Ergonomics Programme in line with the Ergonomics Regulations

In addition to the specific intended outcomes mentioned above, there are generic outcomes that transcend all courses in this training series. These so-called critical cross-field outcomes include the following skills:

- Mastery of concepts and development of core information in disciplines not previously studied
- Time management
- Computing skills
- Access and retrieval of information
- Basic data analysis techniques
- Verbal and written communication
- Argumentation and Critical Thinking
- Project Management
- Stakeholder engagement skills

Requirements for Course Participation

Prior learning: It is necessary for participants to have a diploma or an undergraduate degree from a recognized institution in a cognate discipline, for example, medicine, biokinetics, physiotherapy, engineering, industrial design, health and safety, etc. However, there are no further requirements of prior learning specific to this ergonomics course.

Language competence: Participants must have a solid grasp of the English language (verbal and in writing), since this is the language of tuition.

Computer competence and internet access: This course entirely based on e-learning, hence it is essential that participants are proficient with computer use, and have daily access to the internet so they can engage in online discussions and activities.

Mode of Delivery

Since this course is entirely based on e-learning, participants are guided through a range of activities with the support of facilitators and using Rhodes University's online learning management system "RUconnected" and Zoom.

Cost of Course

Since the course is offered purely online, course fees can be kept low. The full 2-month course will cost R 7 500 per person, and a minimum of 15 participants are required.

Distribution of Hours

This course requires 80 hours of engagement from participants which is distributed over a total duration of 8 weeks (Table). In addition to these 8 weeks, an introductory week ("week 0") has been added prior to the start of the course. During this week participants are provided with course materials, and learn to navigate the online learning management system. This is followed by six weeks of teaching and learning activities, interspersed by two consolidation weeks.

Table IV: Breakdown of hours for "Introduction to Ergonomics and Ergonomics Programmes"

Breakdown of hours	
Online learning	<p>80 hours over 8 weeks:</p> <ul style="list-style-type: none">• Week 0: Introductory week: logging onto learning management system (LMS); familiarization with LMS and course participants; preparatory readings / activities.• Week 1-3: Teaching and learning activities• Week 4: Consolidation week 1• Weeks 5-7: Teaching and learning activities• Week 8: Consolidation week 2

How is the Course run?

The introductory week is intended to familiarize participants with the learning management system (e.g. logging on, navigating the site), as well as getting to know other participants. The course overview and course materials are also supplied during this week. The activities performed during the four weeks of teaching and learning activities will vary from day-to-day and topic to topic. Participants are expected to spend approximately 2 hours per day during the teaching and learning weeks on the interactive course activities, self-directed learning activities and assessments. Online forums mimic classroom discussions and require active engagement from participants. Real-time online meetings may also be used. Compulsory readings are kept to a minimum, but additional resources are supplied for further learning.

The consolidation weeks are strategically placed in the middle and at the end of the course and are intended to allow participants to catch up on any missed activities.

How is the Course assessed?

In order for the qualification to be recognized by Rhodes University and by the Professional Affairs Board of the Ergonomics Society of South Africa, it is not only necessary for participants to have actively engaged with the teaching and learning activities during a course, but also to have demonstrated competence by completing assessment during each module. Assessments, which can range from completing quizzes, to writing tests, essays or reports, are mandatory and participants will be required to obtain an average mark of *50% across all assessments* in order to pass the course.

Evaluating the Course

During and upon completion of the course, participants will be required to provide feedback on the course and any improvement suggestions they may have. Course evaluations can be managed formally by means of an online questionnaire, or informally in a forum discussion, for example.