

# MECHANICS IN SPORTS

Martin Fagerström<sup>1</sup>, Johan Davidsson<sup>2</sup> & Thomas Abrahamsson<sup>2</sup>

<sup>1</sup>Department of Industrial and Materials Science

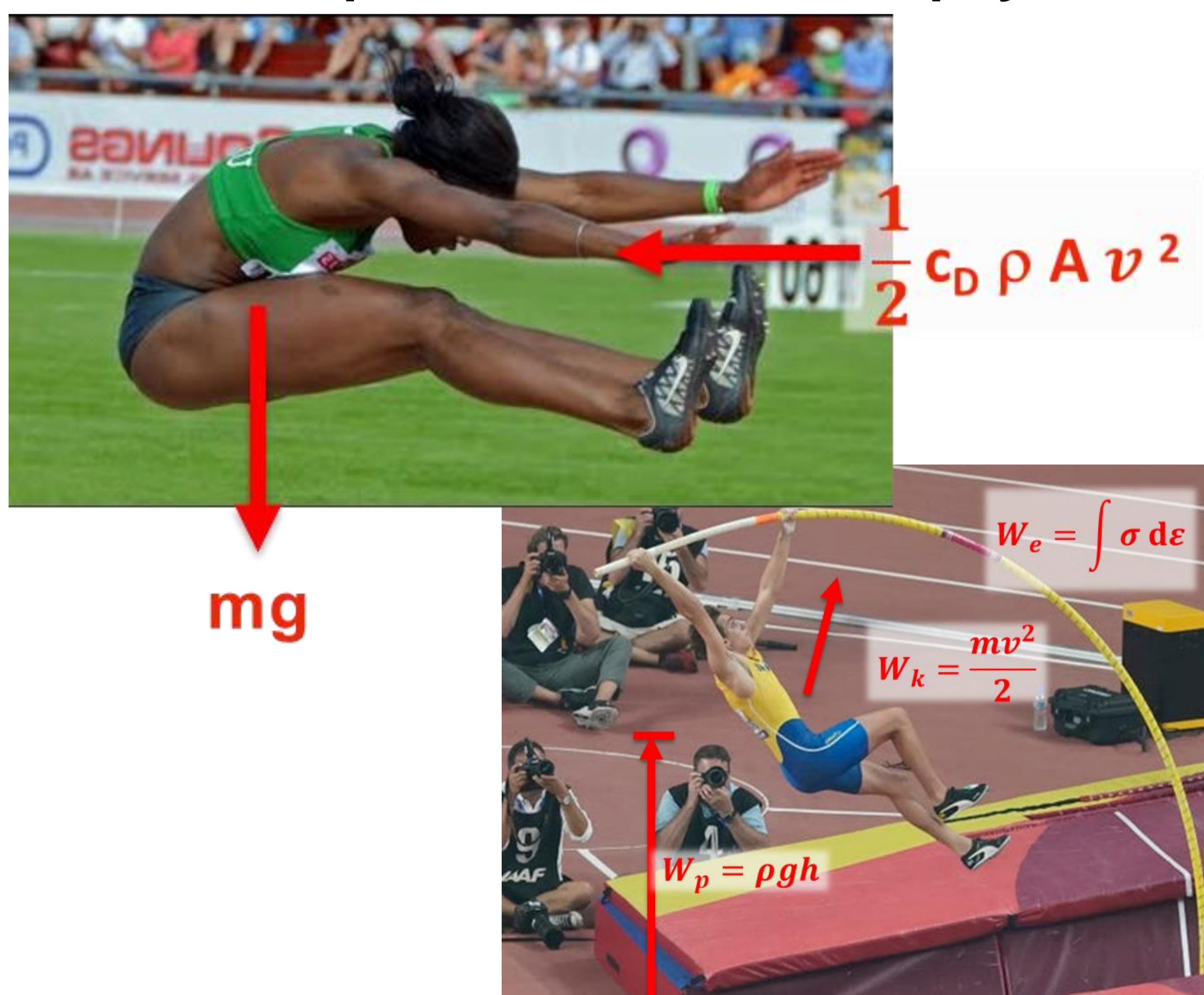
<sup>2</sup>Department of Mechanics and Maritime Sciences

## TRACKS AND THIS COURSE

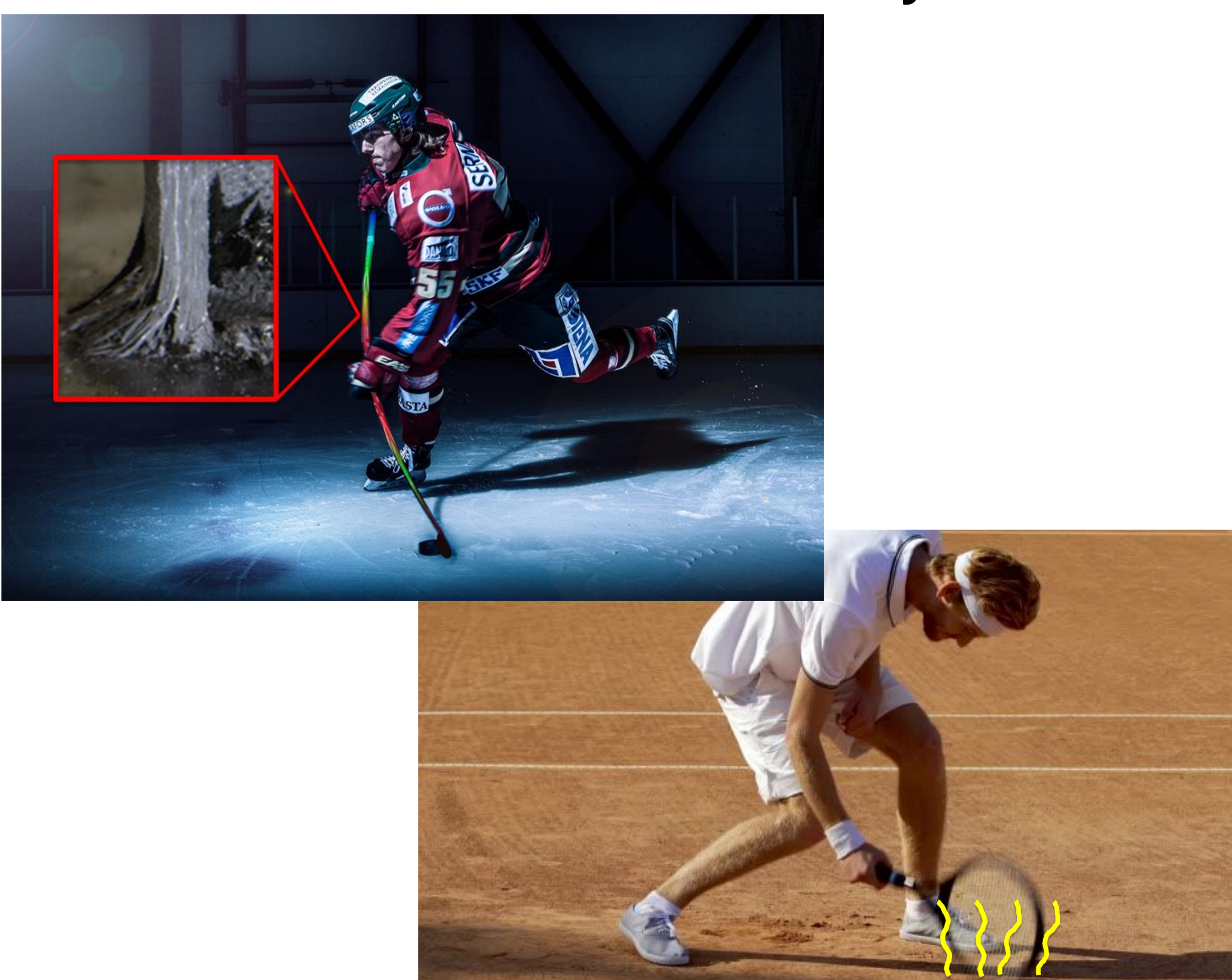
Tracks and this course is about expanding the students' experience and competence in cross-disciplinary collaboration. In this course (TRA100/TRA105 – bachelor/master) within the theme *Health and sports technology* we welcome students from all programmes with relevant prerequisites.

## COURSE CONTENTS

### Basic concepts in mechanics and physics



### Solid mechanics and structural dynamics



## COURSE ENROLLMENT

Apply to the course no later than 1 June by sending an e-mail, including a motivation of your interest in the course, to: [johan.davidsson@chalmers.se](mailto:johan.davidsson@chalmers.se). Please also attach your course transcripts.

We aim at around 15 students (minimum 5) in balanced project groups with a mix of competences and back-grounds (master and bachelor). If the interest is high, there will be a selection of students based on their competence, interests and motivation. Interviews may be called upon.

## Biomechanics



## COURSE PREREQUISITES

- Basic courses in mechanics, dynamics and solid mechanics
- Courses in the finite element method, structural dynamics composite mechanics are meriting but not a requirement.

## LEARNING OUTCOMES

- Be able to explain how basic concepts in mechanics and physics such power, friction, balance of forces total energy can be used to study athletic performance.
- Understand basic mechanical concepts of composite mechanics and how composite material characteristics can be beneficial in sports engineering
- Understand basic mechanical concepts of loading rate-dependent (viscoelastic) materials and how they can be used for energy absorption in sports (impact, damping etc.)
- Discuss sources of common sports injuries, and how these can be mitigated or avoided
- Be able to synthesize and apply knowledge, as specified in points above, to tackle or master problems with open solution spaces