

COACHING EXPLOSIVE SPEED COURSE



**ACADEMY OF SPORT SPEED
AUSTRALIA**

COURSE MANUAL

© May 2020 Ranell Hobson (Head Coach / Training Director ASSA)



Coaching Explosive Speed Course Instructions

Thank you for purchasing the ASSA Coaching Explosive Speed Online course. This course is designed to give you the knowledge and skills to be able to coach Speed for Field and Court Sport athletes.

Within this course you receive:

- Course Welcome video file
- Course Manual (Instructions for completion and all theory presentations)
- Coaching Speed Module (recorded webinar, practical video files and 15 Question quiz)
- Linear Speed Module (recorded webinar, practical video files and 15 Question quiz)
- Multi-directional Speed Module (recorded webinar, practical video files and 15 Question quiz)
- Speed Physicality Module (recorded webinar, practical video files and 15 Question quiz)
- Linear Speed Practical session
- Multi-directional Practical Session
- Practical Self-Assessment Performance criteria guide.

In this course you will learn:

Module 1: Coaching Speed

- The importance of speed in sport
- That coaches should be focussed on educating athletes
- How to use your athletes Warm up as an everyday Assessment tool
- What exercises to use to remedy gaps in movement competencies
- The importance of speed
- The importance of agility
- Difference between speed and force

- Difference between internal and external cuing
- The importance of technical training in speed
- How to improve the energy efficiency of players
- What sport speed coaching includes
- The pillars of speed (mechanics, body composition and physicality)

Module 2: Linear Speed

- Specific Linear Speed Terminology
- The pillars of Linear speed
- The importance of Posture
- Difference between Acceleration and Top Speed
- What to look for and How to Coach Acceleration mechanics
- What to look for when coaching linear speed mechanics
- How to coach Foot strike for maximum force delivery
- How to coach Foot recovery for maintenance of front side mechanics
- How to coach the complete Stride Cycle for efficiency and maximum horizontal propulsion
- How to coach max velocity sprinting
- What to look for in the Arm action of athletes
- When and how to use technical drills
- The importance of training top speed in sport field athletes
- The benefits of training top speed in sport field athletes

Module 3: Multi-directional Speed

- Multidirectional Speed Terminology
- Pillars of Multidirectional speed
- Difference between COD, Agility & Manoeuvrability
- Coaching COD, Agility & Manoeuvrability
- What contributes to perfect mechanics for COD performance
- Tests for COD, Agility and Manoeuvrability
- Best coaching practice for transition to game
- Example session and drills

Module 4: Speed Physicality

- Physical Qualities required for explosive speed
- Qualities of Mobility (Joint ROM, Motor Control, Muscle extensibility)
- Anterior pelvic tilt and dysfunction
- Restrictions in joint function and risks to athlete
- How to maximise stretch reflex and elastic qualities
- Benefits of Plyometric training
- Plyometric training progressions
- Need for eccentric strength
- Strength training for speed foundations
- How to develop the athletic Core
- Core Training – Adaptation focus
- Importance of body composition in speed performance

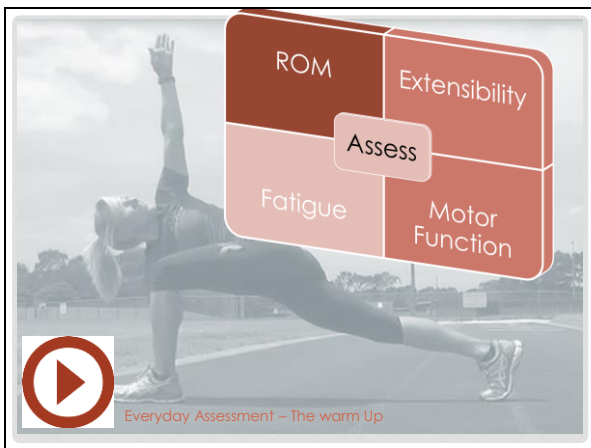
Steps to Completion:

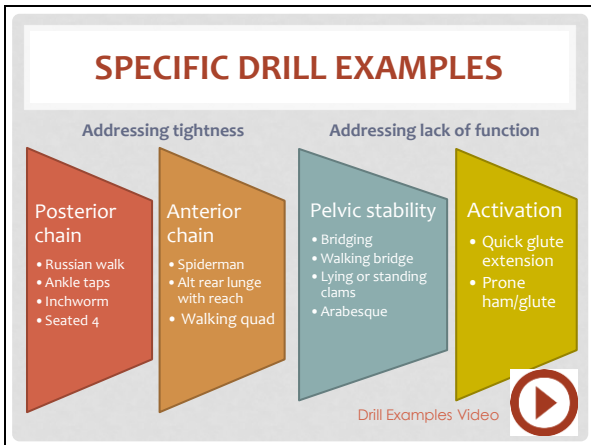
Below you will find the steps to follow to meet the requirements for course completion and the corresponding continuing education and professional development credits.

For best results follow the steps below:

1. Print the course manual so you have the corresponding slides within the presentation and can take notes during the recorded presentations.
2. Watch the coaching speed presentation
3. Complete the coaching speed quiz
4. Watch the Linear speed presentation
5. Complete the Linear speed quiz
6. Complete the practical workshop – Linear speed elements (1-6)
7. Use the Performance criteria evidence guide to assess your linear speed technique
8. Watch the Multi-directional speed presentation
9. Complete the Multi-directional speed quiz
10. Complete the practical workshop – Multi-directional speed elements (7-10)
11. Use the Performance criteria evidence guide to assess your Multi-directional speed technique
12. Watch the Speed Physicality presentation
13. Complete the Speed Physicality quiz
14. Print your course completion certificate.







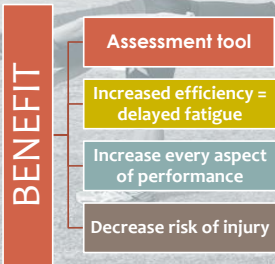
INDIVIDUAL WARM UP & PREP

- This is where as a speed coach you can individualise programming to address issues with each athlete
- OR
- Make these stretches / drills a part of everyone's warm up to cover all your bases



BE ATTENTIVE AND SPECIFIC

attention to detail in drills, skills, exercises, activities



Sport speed, both straight line and multi directional speed is a **Motor Skill**

It can be taught and learned.

Correct neural pathways can be set up and ingrained.

With each **perfect** step moving your athletes closer to their goal of explosive speed and increased fuel efficiency



IMPORTANCE OF AGILITY



“Agility has a more direct impact on performance in team sports due to the fact that there are relatively few opportunities to reach top speed during play”

Steven S Plisk .MS. CSCS. Yale University.
NSCA Essentials of strength and Conditioning 2nd Ed 2000.

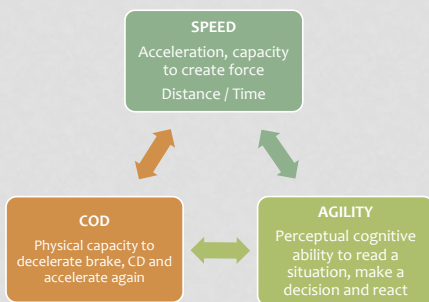
Coaching:
COD changes can occur quickly
Agility changes take time and experience in the game.



The main difference between high level and low level athletes is not the obvious ie: bigger, faster, stronger etc
It is their ability to make a snap judgement and react:
REACTIVE AGILITY



SPEED, CHANGE OF DIRECTION & AGILITY



COACH AS EDUCATOR

WHAT – component of performance the drill or exercise will improve (eg: linear speed)

WHY – it is important for to **master** the drill or exercise (example: increased force production)

HOW – you want the drill performed, demonstrations, instructions, cues



INTERNAL VS EXTERNAL

INTERNAL CUES

- Movement process
- Examples: Extend the hips, Keep shoulders back



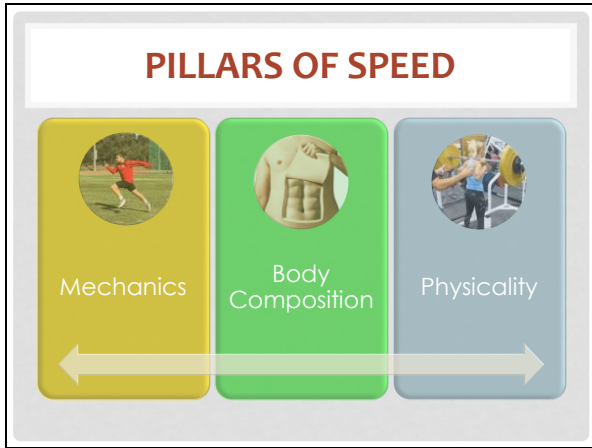
EXTERNAL CUES

- Movement outcome
- Example: Push the ground away
- Ille et al (2013) found that both novice and expert athletes performed faster 10m sprint times with external focus compared with internal and non assigned focus.

If you RUN with POOR mechanics you get TIRED really QUICKLY

Coaching GOOD TECHNIQUE is governed by kinesiology, biomechanics and physics





MECHANICS

When an athlete learns HOW to run, they apply maximum force through the foot into the ground in the right direction. This drives horizontal speed. The technique used for acceleration and for maximum speed are different and need to be coached correctly.

The photograph shows a male athlete in a white t-shirt and black shorts running on a track. A female coach in a red t-shirt with 'ASSA' on the back is standing to the right, watching him run.

BODY COMPOSITION

The photograph shows a person's torso from the waist up. A layer of tan-colored material, representing fat, is being peeled away from the abdominal area, revealing the underlying muscles.

Athletes who apply the most force relative to body mass and in the right direction, are faster athletes. This is simple, the more fat mass you have, the more strength and endurance you need to carry that mass down the track, around the field or the court. Fat is useless mass which slows you down.

PHYSICALITY



Speed strength is your expression of Power. To be fast you must be strong in speed conditions. Strength relative to bodyweight is the foundation of Acceleration. You need excellent postural strength and specific strength for speed.



The ability to pull the foot back into a dorsiflexed position (toes pulled back towards shin) so that the Achilles tendon can act as a spring upon foot strike is integral in achieving great speed.

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ACCELERATION CONT.



Posture	Straight line from head to heel on stance leg
Ground Contact	Straight back, braced core, ball of foot contact, positive shin contact, shin parallel to rear thigh
Push	Pushing force through foot, driving opposite knee forward, near full extension of hip, knee and ankle

TRAINING ACCELERATION

- Wall acceleratory drill
- Prone start
- Push up start
- 3 point start
- Crouch start
- Falling start
- Rolling start




Acceleration Drills Video

CONTEXTUAL INTERFERENCE



After a period of block training, integrate contextual interference into the Acceleration training for greater skill acquisition and game transfer


"Speed may be a generic quality, but the mechanical horizontal determinants of acceleration and maximal sprinting speed differ.



While maximal speed training may improve both acceleration and maximal sprinting speed, improving horizontal force production capability may be efficient to enhance sprinting performance over short distances."


Reference
Buchheit et al. Journal of Sports Sciences 2014

MAX VELOCITY



Constraints exist across sports when it comes to hitting top speed but everyone wants to cover as much ground as possible in the shortest possible time.

All great sprinters produce lots of vertical force and spend very little time on the ground.



STRIDE CYCLE MECHANICS



- High hip position
- Punch the knee
- COM high
- Short lever

Common Faults

- Sitting low in the hips
- Shuffling (no knee lift)
- Windmilling



STRIDE TIME

- The time taken to complete one stride (full cycle)

$$\text{Stride time} = \text{stride speed} \times \text{angular velocity}$$

- Stride speed – physiological
- Angular velocity - biomechanical



STRIDE LENGTH



HIP MOBILITY

GLUTE STRENGTH

D&M FOOTSTRIKE

TRAINING MAX VELOCITY

Modes:

- Flying sprints
- Variable speed sprints (SSS)
- Short speed endurance
- Long speed endurance (track only)

Distance:

- 10 – 40m (field sports) – up to 60m (large field AFL)
- Large variations for track athletes 50m to 120m

Rest:

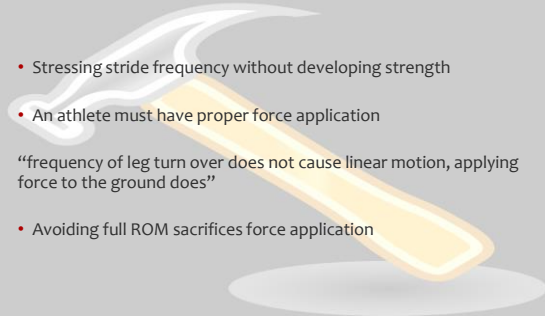
- 30 – 60 sec per 10m

ILLUSION OF SPEED

- Stressing stride frequency without developing strength
- An athlete must have proper force application

“frequency of leg turn over does not cause linear motion, applying force to the ground does”

- Avoiding full ROM sacrifices force application



ARM ACTION

- go' at elbow and shoulder
- First few steps in acceleratory position can be whipping action

Common Faults

- Swings across midline of body
- Too high
- Too low
- Drummer boy



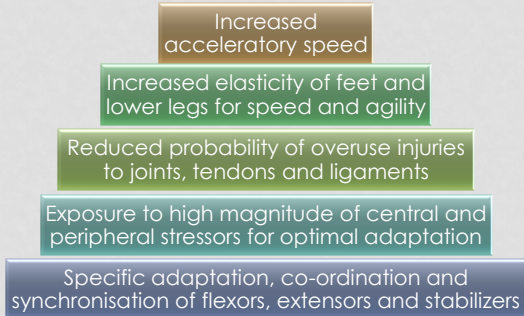
TECHNICAL DRILLS

- Use to reinforce correct patterns of movement
- Change incorrect patterns
- Choose a few drills that are specific to the problem
- Complete pre-conditioning (fresh nervous system)
- Not a replacement for actual sprinting



Max Velocity Technical drill progressions

WHY TOP SPEED FOR FIELD SPORT ?



Faude, Koch & Meyer (2012)
Journal of Sports Sciences

Straight sprinting is the most frequent action in goal situations in professional football

- Research was conducted in the first German National League in the 2007/08 season.
- 360 goals were analysed
- Most actions of the scoring player were straight sprints
- Without an opponent
- Without the ball

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COD & AGILITY

- In sport you have to accelerate and then STOP, Change direction, Execute a skill, Make contact with another player etc
- Perceptual cognitive – Time it takes to react to a stimulus.
- Work on braking (hip, knee and ankle flexion) for both 2 and 1 leg actions.
- Work on propulsion in all directions, accelerating forward, sideways, turning, practice getting up from the ground etc.
- Once the athlete is proficient at this then add in your technical and tactical aspects – add stimulus – add decision making

IDENTIFYING FACTORS



✓The ability to start quickly from different positions

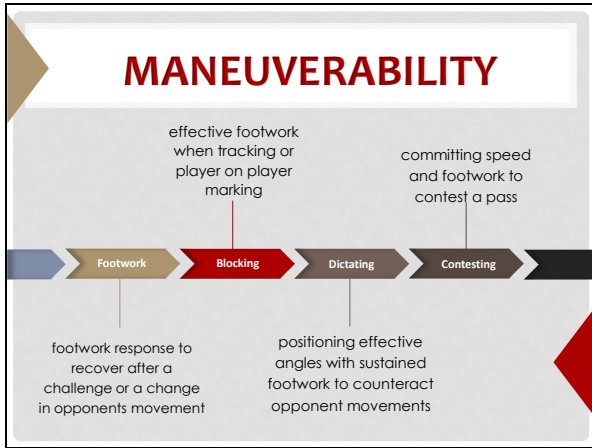


✓Accelerate to top speed in the shortest possible time

✓Change direction and brake / stop under control

✓Rapidly react to a stimulus

Those who apply the most FORCE relative to Body Mass and in the right DIRECTION are FASTER ATHLETES




COD DRILLS / TESTS

- 5-0-5
- Pro-agility
- T drill
- Illinois Agility
- Box drill
- RAT (arrow /light/video/ human)



QUICKNESS



BEST PRACTICE

- Mix competitive game based aspects with opportunities to focus on technical deficiencies.
- S&C and Technical coaches working **TOGETHER**



EXAMPLE SESSION

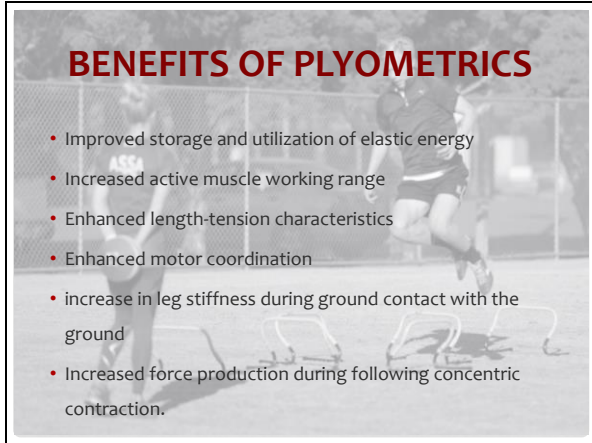
1	Game play warm up
2	Dynamic and Functional warm up
3	Plyometrics – jumps, hops, bounds (landing technique, 1 & 2 feet in all directions)
4	Competitive speed work without cueing (observe)
5	Technical session to work on deficiencies identified in competitive situation

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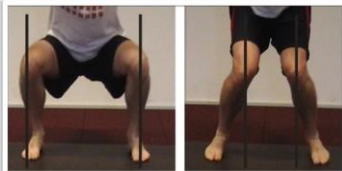
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BENEFITS OF PLYOMETRICS

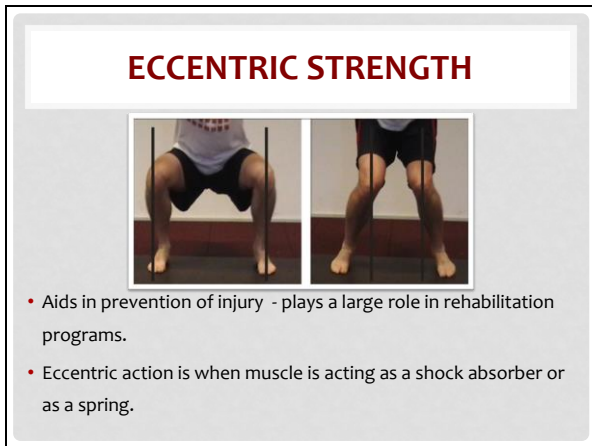
- Improved storage and utilization of elastic energy
- Increased active muscle working range
- Enhanced length-tension characteristics
- Enhanced motor coordination
- increase in leg stiffness during ground contact with the ground
- Increased force production during following concentric contraction.



ECCENTRIC STRENGTH

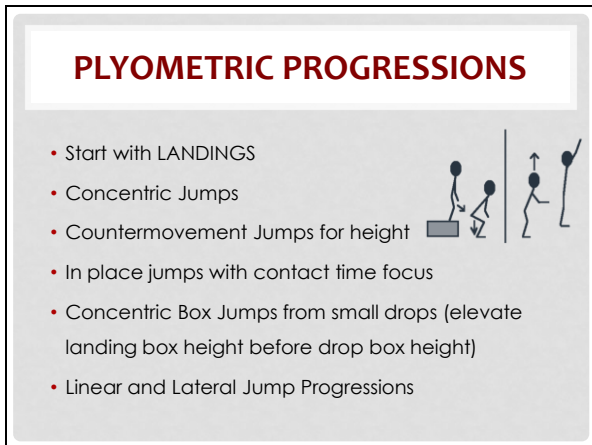
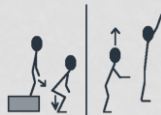


- Aids in prevention of injury - plays a large role in rehabilitation programs.
- Eccentric action is when muscle is acting as a shock absorber or as a spring.



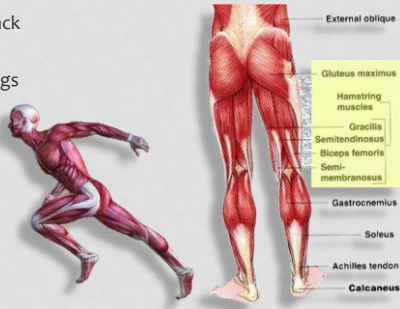
PLYOMETRIC PROGRESSIONS

- Start with LANDINGS
- Concentric Jumps
- Countermovement Jumps for height
- In place jumps with contact time focus
- Concentric Box Jumps from small drops (elevate landing box height before drop box height)
- Linear and Lateral Jump Progressions



POSTERIOR CHAIN

- Lower back
- Gluteals
- Hamstrings
- Calves



HAMSTRINGS

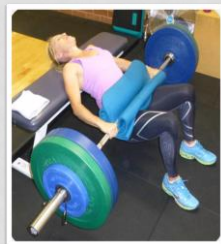
- Train both as knee flexors and hip extensors
- Build Robustness
- Eccentric training
- Both Unilateral and Bilateral training



GLUTEALS

The strength of the hips and gluteals will directly influence:

- Acceleration from a standing position
- Top end speed
- Deceleration
- Running one and two leg jumps
- Injury prevention to hamstrings and/or low back



MOVEMENTS TO TRAIN

Movement / Action

Flexion of Spine

Extension of Spine

Lateral flexion

Spinal rotation

Diagonal rotations

Static holds

Static holds with limb movements



PROGRESSIONS

- Start with deep musculature development

- Train in ALL directions

- Short levers to long

- Stable to unstable

- Wide base of support to narrow (contact points 4, 3, 2)



BODY COMPOSITION



Newtons 2nd law – Acceleration is directly proportional to the **force** applied but inversely proportional to the **mass** of the person



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- Physical Qualities required for explosive speed
- Qualities of Mobility (Joint ROM, Motor Control, Muscle extensibility)
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END OF THEORY MODULES