

Draft of PhD thesis topics for academic year 2016/2017

Topic: *Rheological behaviour of oil bearing crops bulk seeds under compression loading*

Supervisor: *prof. Ing. David Herák, Ph.D.*

The aim of this thesis is to describe relaxation and creep behaviour of selected oil bearing crops bulk seeds under compression loading. Determination of appropriate mathematical models is integral part of this thesis.

Topic: *Models of mechanical behaviour of oil bearing crops bulk seeds under compression loading*

Supervisor: *prof. Ing. David Herák, Ph.D.*

The aim of this thesis is to determine different mathematical models for description of mechanical behaviour of oil bearing crops bulk seeds and to joint these models with physical background of bulk seeds pressing.

Topic: *Mechanical behaviour of composite materials produced from fibres of Ensete Ventricosum*

Supervisor: *prof. Ing. David Herák, Ph.D.*

The aim of this thesis is to describe mechanical behaviour of composites materials produced from Ensete Ventricosum fibres (false banana) and to determine mathematical models of mechanical behaviour.

Topic: *Advanced analysis of mechanical behaviour of Jatropha curcas bulk seeds under compression loading*

Supervisor: *prof. Ing. David Herák, Ph.D.*

The aim of this thesis is to describe mechanical behaviour of Jatropha bulk seeds in their individual layers under compression loading and to determine model for stress and strain calculations in general position of pressed bulk seeds.

Topic: *Influence of the sun drying on the quality of the food products in tropical countries*

Supervisor: *prof. Ing. David Herák, Ph.D.*

The thesis is focused on description of the influence of the sun drying systems such as open sun, shade sun and solar as well as canvas or sieve drying systems on the quality of the food products. The aim of the research is to analyse colour, taste, capsaicin, alpha toxin and other chemicals properties of examined products and their influence on the quality of the final product. The research and experiments can be carried out in tropical countries

Topic: *Rheological behaviour of Ensete Ventricosum fibers*

Supervisor: *prof. Ing. David Herák, Ph.D.*

The aim of this thesis is to describe relaxation and creep behaviour of Ensete Ventricosum fibres under tension loading. Determination of mathematical models will be integral part of this thesis.

Topic: *Analysis of mechanical behaviour of selected oil bearing crops bulk seeds under dynamic compression loading*

Supervisor: *prof. Ing. David Herák, Ph.D.*

The aim of this thesis is to describe mechanical behaviour of oil bearing crops bulk seeds under compression loading and to determine mathematical models of this behaviour.

Topic: *Work of Telematic Systems in Agricultural Field Operations*

Supervisor: *asc. prof. Ing. Petr Šařec, Ph.D.*

The aim of the work is to examine the effects of telematic systems on machinery work rate, costs and other operational characteristics. The work would be based on field monitoring comparing machinery equipped with different telematic systems.

New topic of PhD thesis can be opened according to the mutual agreement between student and supervisor.