**Preliminary schedule of the course “Wood science and technology” -15 pts**

**20th January - 24th March 2021 (SG0213)**

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|  | **Lectures** |
|  | **Individual studies** |
|  | **Student-lecturer(s) individual discussion** |
|  | **Seminars** |
|  | **Oral examination** |

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| **Date** | **Time** | **Topic** | **Hours\*** | **Lect.** |
| 20/01 | 13:00-14:45 | **Introduction- structure and organization of the course.**  **Key concepts and limitations of the course**: Sustainable development, biomaterials, bio-refinery, green technologies. Dividing into groups and study tasks. | 2 | GD, NT |
| **Wood science** | | | | |
| 21/01 | 09:00-11:45 | Chemistry of wood and extractives | 3 | MJ |
| 13:00-13:45 | Variations and interrelations between the wood properties. Statistical tools in wood science | 1 | NT |
| 22/01 | 09:00-11:45 | Anatomy of softwoods | 3 | GD |
| 13:00-16:00 | Individual studies |  |  |
| 23/01 |  | **Weekend** |  |  |
| 24/01 |
| 25/01 | 09:00-11:45 | Anatomy of hardwoods | 3 | GD |
| 13:00-16:00 | Individual studies |  |  |
| 26/01 | 09:00-11:45 | Durability of wood to fungi, insects and marine borers. | 3 | GD |
| 27/01 | 09:00-11:45  13:00-14:45 | Durability of wood to fungi, insects and marine borers. | 4 | GD |
| 14:00-16:00 | Individual studies |  |  |
| 28/01 | 09:00-11:45 | Physical properties of wood. Density, wood-water relationships, shrinkage & swelling. | 3 | NT |
| 13:00-13:45 | Thermal properties of wood | 1 | MN |
| 29/01 | 09:00-9:45 | Colour, odour and acoustic properties of wood | 1 | NT |
| 10:00-10:45 | Mechanical properties of wood | 1 | MJ |
| 11:00-11:45 | Weathering of wood and consequences | 1 | NT |
| 13:00-13:45 | Brief review – most used timbers of the world | 1 | NT |
| 14:00-16:00 | Individual studies |  |  |
| 30/01 |  | **Weekend** |  |  |
| 31/01 |
| 01/02 | 09:00-11:45  13:00-13:45 | Student-lecturer(s) individual discussion | 4 | MJ, NT,  GD |
| 02/02 | 09:00-11:45  13:00-13:45 | Student-lecturer(s) individual discussion | 4 | MJ, NT,  GD |
| **Sawmilling of solid wood** | | | | |
| 03/02 | 09:00-9:45 | Soft- and hardwood timber classes | 1 | NT |
| 10:00-10:45 | Sawmilling – storage of timber | 1 | NT |
| 11:00-11:45  13:00-13:45 | Sawmilling – measuring of timber; classes | 2 | NT |
| 04/02 | 09:00-10:45 | Sawing of timber – methods and sawn products | 2 | NT |
| 11:00-11:45 | Manual and machine timber grading for construction aims | 1 | NT |
| 13:00-16:00 | Individual studies |  |  |
| 05/02 | 09:00-16:00 | Individual studies |  |  |
| 06/02 |  | **Weekend** |  |  |
| 07/02 |
| 08/02 | 09:00-11:45 | **Seminar I: Wood science & sawmilling** | 3 | GD, NT,  MJ |
| **Pulp and paper** | | | | |
| 09/02 | 09:00-11:45  13:00-13:45 | Pulp and paper – mechanical processing | 4 | DF |
| 10/02 | 09:00-11:45  13:00-13:45 | Pulp and paper –chemical processing | 4 | GD |
| 11/02 | 09:00-16:00 | Individual studies |  |  |
| 12/02 | 09:00-16:00 | Individual studies |  |  |
| 13/02 |  | **Weekend** |  |  |
| 14/02 |
| 15/02 | 09:00-11:45  13:00-15:45 | Student-lecturer(s) individual discussion | 6 | GD, DF |
| 16/02 | 09:00-11:45 | **Seminar II: Wood science, Pulp and paper** | 3 | GD, DF, MJ, NT |
| **Wood-engineering products** | | | | |
| 17/02 | 09:00-10:45 | ***Bio-composites***: adhesives, bio-based binders and non-conventional bonding | 2 | MJ |
| 11:00-11:45  13:00-15:45 | Wood-based composites: veneer, plywood, fiber- and particle boards, oriented strand board (OSB) | 4 | SA |
| 18/02 | 09:00-11:45  13:00-13:45 | Wood-based composites: Cross-laminated timber (CLT) and laminated veneer lumber (LVL). Wood fiber insulation | 4 | SA |
| 19/02 | 09:00-11:45 | Wood thermoplastic composites | 3 | MJ |
| 20/02 |  | **Weekend** |  |  |
| 21/02 |
| 22/02 | 09:00-16:00 | Individual studies |  |  |
| 23/02 | 09:00-11:45 | Nano-based biomaterials & biorefineries - Modern approaches for utilizing cellulose, hemicelluloses & lignin in new products and processes | 3 | GD |
| 24/02 | 09:00-11:45 | Nano-based biomaterials & biorefineries- cont. | 3 | GD |
| 25/02 | 09:00-16:00 | Individual studies |  |  |
| 26/02 | 09:00-11:45  13:00-15:45 | Student-lecturer(s) individual discussion | 6 | SA, GD,  DF, MJ |
| 27/02 |  | **Weekend** |  |  |
| 28/02 |
| **Industrial wood protection** | | | | |
| 01/03 | 09:00-9:45 | Aims of wood protection. Biocides used for chemical wood protection | 1 | MJ |
| 10:00-11:45 | Impregnated timber-processing and treated items | 2 | NT |
| 13:00-16:00 | Individual studies |  |  |
| 02/03 | 09:00-11:45 | Wood modification – aims, mode of action and methods. Acetylation, furfurylation, DMDHEU and other modification methods. Novel approaches for wood modification | 3 | MJ |
| 13:00-14:45 | Thermal modification of wood | 2 | JG |
| 03/03 | 09:00-16:00 | Individual studies |  |  |
| 04/03 | 09:00-16:00 | Student-lecturer(s) individual discussion | 6 | MJ, NT, JG |
| 05/03 | 09:00-11:45 | **Seminar III: Wood-engineering products, nano-based materials and biorefineries** | 3 | GD, SA, DF, MJ, NT, JG |
| 06/03 |  | **Weekend** |  |  |
| 07/03 |  |  |
|  |  | **Bioenergy, biofuels, timber in buildings** |  |  |
| 08/03 | 09:00-10:45 | Use of bio-renewable resources for energy – wood, herbaceous crops, algae | 2 | JJ |
| 11:00-11:45  13:00-13:45 | Conversion of biomass into heat and power by direct combustion, thermal gasification and anaerobic digestion | 2 | JJ |
| 09/03 | 09:00-10:45 | Processing of biomass into chemicals and fuels: breakdown to sugars, alcohols, biodiesel and thermochemical conversion | 2 | MS |
| 11:00-11:45  13:00-14:45 | ***Construction timber in buildings*** - modern developments for using solid wood & glulam in high buildings & bridges. | 3 | PG |
| 10/03 | 09:00-11:45  13:00-13:45 | ***Other biomaterials*** – Non-wood fibers (bamboo, hemp, rattan, flax) available and biological/physical/mechanical characteristics, properties and limitations. Current commercial uses of non-wood fiber materials in composites and their potential and competition to wood fibers. | 4 | DF, NT |
| 11/03 | 09:00-16:00 | Individual studies |  |  |
| 12/03 | 09:00-16:00 | Individual studies |  |  |
| 13/03 |  | **Weekend** |  |  |
| 14/03 |
| 15/03 | 09:00-16:00 | Student-lecturer(s) individual discussion |  | DF, NT |
| 16/03 | 09:00-11.45 | **Seminar IV: Industrial wood protection and non-wood materials** |  | GD, SA, DF, MJ, NT, JG |
| 17/03 |  | Pre-examination individual studies |  |  |
| 18/03 |  | Pre-examination individual studies |  |  |
| 19/03 |  | Pre-examination individual studies |  |  |
| 20/03 |  | **Weekend** |  |  |
| 21/03 |
| 22/03 | 09:00-16:00 | Consultation before the examination | 6 | All staff |
| 23/03  24/03 | 09:00-16:00 | Individual oral examinations | 1  /student | GD, NT |
|  | | | | |
|  |  | ***Preliminary total: … h lectures, … h consult., …h seminars*** |  |  |

\**Academic hour equal to 45 min*

***Lecturers:***

PG Patrice Godonou

MN Meysam Nazari

SA Stergios Adamopoulos

GD Geoffrey Daniel

DF Dinesh Fernando

JG Jie Gao

JJ Jeevan Jayasuriya

MJ Mohamed Jebrane

NT Nasko Terziev

MS Mats Sandgren

***Communication:*** Zoom video/audio

***Language:*** English

***Compulsory:*** Lectures and seminars

***Lunchtime*:** always at 11:45-13:00