Harmonized European Training Syllabus for Thoracic Surgery
Module 1 Basic Principles MANDATORY
1. Thoracic morphology as applied in GTS
1.1 Embryology of thoracic organs
1.2 Histology of thoracic organs
1.3 Surgical anatomy of the chest
1.4 Radiological anatomy of the chest
1.5 Endoscopic anatomy of airways and upper GI
2. Thoracic Physiology as applied in GTS
2.1 Dynamics of chest wall, pleural space and diaphragm
2.2 Ventilation
2.3 Gas exchange
2.4 Central regulation of breathing
2.5 Respiratory acid---base balance
2.6 Swallowing and aspiration
2.7 Cardiopulmonary circulation
2.8 Haemostasis and coagulation
3. Essentials in pharmacology applied to GTS
3.1 Anticoagulants and antiplatelets
3.2 Local anaesthetics and analgesics
3.3 Anti---infectious treatments
3.4 Steroids
3.5 Anti---cancer treatments for thoracic malignancies
3.6 Bronchodilators
3.7 Immunosuppressive drugs
3.8 Antimyasthenic drugs
3.9 Blood---derived products
3.10 Diuretics
3.11 Inotropes
3.12 Antiarrythmics
3.13 Antihypertensive drugs
3.14 Inhaled gas therapy (oxygen etc)
Module 2 Diagnostic Evaluation MANDATORY
1. General signs and symptoms
1.1 Weight loss

1.2 Fatigue
1.3 Fever
2. Respiratory Symptoms
2.1 Chest pain
2.2 Dyspnoea
2.3 Stridor
2.4 Cough
2.5 Haemoptysis
3. Esophageal signs and symptoms
3.1 Haematemesis
3.2 Heartburn
3.3 Dysphagia
4. Paraneoplastic syndromes
5. Arrythmia
6. Non---invasive diagnostic tools
6.1 Standard chest X---ray and fluoroscopy
6.2 Chest ultrasound
6.3 CT scan
6.4 MRI
6.5 PET scan
6.6 Radionucleotide scanning
6.7 Upper gastrointestinal (GI) contrast studies
7. Invasive diagnostic tools
7.1 Bronchoscopy: fiberoptic, rigid
7.2 Transthoracic needle aspiration (TTNA)
7.3 Mediastinal endoscopic and open diagnostic procedures
7.4 Thoracoscopy
7.5 Esophageal functional assessment
7.6 Staging laparoscopy
7.7 Lymph node biopsy
7.8 Peripheral lung biopsy
7.9 EBUS and EUS
7.10 EUS

Module 3 Patient care on the ward MANDATORY
1. Preoperative work---up
1.1 Standard evaluation of respiratory function
1.2 Assessment of cardiac (coronary) risk
1.3 Evaluation of patients with limited cardiopulmonary function
1.4 Nutrition and performance status and comorbidities
1.5 Functional assessment of geriatric patient
1.6 Tobacco and other substance abuse
2. Postoperative care
2.1 Prevention of thromboembolism
2.2 Antibiotic prophylaxis
2.3 Physiotherapy
2.4 Thoracic tube drainage
2.5 Pain management
3. Procedures in the ward
3.1 Management of wound problems
3.2 Central venous access
3.3 Arterial puncture and catheterisation
3.4 Thoracentesis
3.5 Chest tube placement
3.6 Mini tracheostomy
3.7 Pericardiocentesis
3.8 Bedside pleurodesis
4. Early recognition and principles of treatment of procedure---related complications
4.1 Management of prolonged air leak and abnormal fluid drainage
4.2 Chylothorax
4.3 Supraventricular tachycardia
4.4 Postoperative bleeding
4.5 Pneumonia and atelectasis
4.6 Sepsis
4.7 Empyema and bronchopleural fistula
4.8 Esophageal leak
4.9 Wound infections and sternal dehiscence
4.10 Torsion of the lung
Module 4 Intensive care for GTS MANDATORY

1. Critical care problems
1.1 Acute respiratory failure and Acute Respiratory Distress Syndrome (ARDS)
1.2 Hypovolemic shock
1.3 Distributive shock
1.4 Cardiogenic shock
1.5 Obstructive shock
2. Metabolic Disorders
2.1 Disorders of acid---base balance
2.2 Electrolyte disturbances
2.3 Renal failure
2.4 Myasthenic crisis
2.5 Other endocrine Disturbances (Disfunctions)
2.6 Hypothyroidism & Addisson crisis
Module 5 Thoracic emergencies and trauma MANDATORY
Thoracic emergencies
1. Tension pneumothorax
2. Cardiac tamponade
3. Post---traumatic haemothorax
4. Pulmonary embolism
5. Life---threatening asthma and chronic obstructive pulmonary disease (COPD) exacerbations
6. Tracheal obstruction and tracheobronchial foreign body
7. Massive haemoptysis
8. Esophageal foreign body
9. Esophageal disruption
10. Superior Vena Cava (SVC) obstruction
Trauma
11. Acute management : damage control and context of polytrauma
12. Rib fractures and flail chest
13. Tracheobronchial disruption
14. Heart and great vessel injuries
15. Thoracic wounds
16. Long---term consequences of trauma
Module 6 Surgical diseases and disorders of the lung MANDATORY
1. Primary Lung Cancer
1.1 Background

1.1.a Epidemiology and risk factors
1.1.b Screening
1.1.c Pathology
1.1.d Biomarkers
1.1.e Natural history
1.2 Diagnosis
1.2.a Clinical presentations
1.2.b Obtaining tissue diagnosis
1.3 Staging
1.4 surgical management
1.4.a Resectability/operability
1.4.b Oncologically radical resection
1.4.c Patient selection for VATS major resection
1.4.d Parenchymal---sparing surgery : bronchoplastic and angioplastic lobectomies
1.4.e Parenchymal sparing surgery : anatomic segmentectomy and wedge
1.4.f Operative risk and oncologic benefit of pneumonectomy
1.4.g Surgery after induction therapy
1.4.h Oligometastatic lung cancer
1.4.i Palliative resection
1.5 multimodality treatments
1.5.a Induction chemotherapy
1.5.b Perioperative radiation therapy
1.5.c Adjuvant chemotherapy
1.5.d Multidisciplinary teams (MDT)
1.6 non---surgical treatments
1.6.a Classic chemotherapy
1.6.b Targeted therapies
1.6.c Immunotherapy
1.6.d Radiation therapy principles
1.6.e Supportive care
2. Pulmonary metastasis
2.1 Principles of surgical management of metastatic disease
2.2 Colorectal cancer
2.3 Renal cancer
2.4 Soft tissue sarcoma
2.5 Bone tumours
2.6 Germ cell tumours
2.7 Palliation of recurrent metastatic pleural effusion

2.8 Other metastatic cancers
3. Rare tumours of the lung and airway
3.1 Low grade malignancies
3.2 Primary sarcomas
3.3 Lymphoma of the lung
3.4 Other rare malignancies
3.5 Benign tumours
4. Pulmonary TB
4.1 Clinical presentations
4.2 Diagnosis
4.3 Medical management principles
4.4 Indication for surgery and strategy
4.5 Hygiene protocols on the ward
4.6 Particularities of atypical mycobacteriosis
5. Pulmonary infections : miscellaneous
5.1 Ecchinococcosis
5.2 Aspergillosis
5.3 Other fungal diseases
5.4 Actinomycosis
5.5 Pneumocystosis
5.6 Lung abscess
5.7 Lung gangrene
6. Bronchiectasis
6.1 Nosologic classification
6.2 Principles of conservative management
6.3 Planning resection for limited disease
6.4 Planning for lung transplantation
6.5 Particularities in patients with cystic fibrosis
7. Emphysema and COPD
7.1 Pneumothorax
7.2 Bullous emphysema
7.3 LVRS for diffuse emphysema
7.4 Endoscopic treatments for emphysema
7.5 Lung transplantation

7.6 Perioperative care of patients with COPD
8. Interstitial lung disease
8.1 Diagnosis and risks
8.2 Sarcoidosis
8.3 Idiopathic pulmonary fibrosis
8.4 Other interstitial diseases
8.5 Occupational diseases
8.6 Lung transplantation
9. Pulmonary embolism and hypertension
9.1 Diagnosis
9.2 Medical treatment in the acute setting
9.3 Surgical indications at the acute stage
9.4 Thromboendarterectomy for secondary hypertension
9.5 Lung transplantation for pulmonary hypertension
Module 7 Surgical diseases and disorders of the pleura MANDATORY
1. Spontaneous pneumothorax
1.1 Epidemiology and clinical presentation
1.2 Management of first episode
1.3 Recurrent pneumothorax
2. Secondary pneumothorax
3. Catamenial pneumothorax
4. Rare causes of pneumothorax
5. Complicated pneumothorax
6. Empyema
6.1 Diagnosis and stages of parapneumonic empyema
6.2 Post---operative empyema
6.3 Conservative management
6.4 Surgical management options
Pleural tumours
7. Mesothelioma
8. Carcinomatosis
9. Solitary fibrous tumour
10. Thymoma droplets

Pleura : miscellaneous
11. Tuberculous empyema
12. Fungal empyema
13. Chylothorax
14. Chronic pleural effusion
15. Residual space
Module 8 Surgical diseases and disorders of the chest wall MANDATORY
1. Chest wall tumours
2.Osteoradionecrosis
3. Congenital deformities
4. Sternal complications after heart surgery
5. Indications for Thoracoplasty
6. Principles of soft tissue coverage
7. Hernia of the chest wall
8. Infections of the chest wall
9. Thoracic outlet syndrome
Module 9 Surgical diseases and disorders of the Diaphragm MANDATORY
1. Congenital abnormalties and hernias of the diaphragm
2. Giant hiatal hernia
3. Post---traumatic hernia
4. Eventration of the diaphragm
5. Paralysis of the diaphragm
6. Diaphragmatic pacing
7. Porous diaphragm
8. Tumour of the diaphragm
Module 10 Surgical diseases and disorders of the cervico---thoracic region MANDATORY
Trachea
1. Tracheal tumours
2. Tracheal stenosis
3. Iatrogenic lesions
4. Extrinsic compression
5. Respiratory---gastrointestinal fistula
6. Congenital abnormalities
7. Tracheomalacia and tracheal dyskinesia
Thyroid

8. Compressive and Intrathoracic goiter
9. Thyroid cancer
Module 11 Surgical diseases and disorders of the mediastinum MANDATORY
1. Thymoma
1.1 Epidemiology
1.2 Pathology classification (WHO)
1.3 Staging (Masaoka---Koga)
1.4 Invasive and Non---invasive Diagnosis
1.5 Indications for upfront surgery and multimodality treatment
2. Myasthenia gravis
2.1 Screening/diagnosis of myasthenia gravis
2.2 Perioperative management of myasthenia gravis
2.3 Thymectomy for myasthenia gravis
3. Other tumours of the mediastinum
3.1 Germ cell tumours
3.2 Lymphoma
3.3 Parathyroid adenoma
3.4 Diagnosis of mediastinal lymph nodes
3.5 Cysts of the foregut
3.6 Neurogenic tumours
3.7 False tumours : mediastinal goiter
4. Infectious and inflammatory disorders of the mediastinum
4.1 Descending necrotising mediastinitis
4.2 Post---interventional mediastinitis
4.3 Mediastinal fibrosis
Module 12 Surgical disorders and diseases of the Oesophagus and Gastroesophageal junction OPTIONAL
1. Cancer of the esophagus
1.1 Background
1.1.a Epidemiology and risk factors
1.1.b Pathologic classification
1.1.c Rare tumours
1.2 Invasive and non---invasive diagnosis and staging
1.3 Assessing operability and fitness

1.4 Oncologically radical resection
1.5 Indications and technique of different types of resection/reconstruction
2. Particular aspects of cancer of the cardia
3. Benign diseases of the pharyngoesophageal junction
3.1 Motor disorders
3.2 Zencker's diverticulum
3.3 Foreign bodies
3.4 Instrumental perforation
4. Benign diseases of the esophagus
4.1 Congenital disorders
4.2 Motor disorders
4.3 Diverticula
4.4 Benign tumours
4.5 Caustic injury
4.6 Barogenic rupture
4.7 Instrumental perforation
4.8 Foreign bodies
4.9 Thoracic complications of Upper abdominal surgery
4.10 Respiratory esophageal fistulas
5. Hiatal hernia and GERD
5.1 Anatomic classification of hernias
5.2 Symptoms of GERD
5.3 Medical management of GERD
5.4 Complications of GERD
5.5 Surgical anti---reflux procedures and perioperative management of GERD
Module 13 Paediatric thoracic surgical disorders and diseases OPTIONAL
1. Congenital abnormalties of the lung bronchi and parenchyma
2. Congenital tracheal stenosis and tracheobronchomalacia
3. Esophageal atresia and fistula
4. Congenital diaphragmatic hernia
5. Deformities of the anterior chest wall
6. Empyema
7. Bronchiectasis
8. Thoracic trauma in children

9. Foreign body aspiration
Module 14 Neurovegetative disorders MANDATORY
1. Hyperhydrosis and facial blushing
2. Recurrent nerve paralysis
3. Vagal nerve injuries
4. Perioperative peripheral nerve injuries
Module 15 Access to the chest and incisions MANDATORY
Access to the chest
1. Accurate port placement and insertion for VATS procedures
2. Standard posterolateral thoracotomy
3. Muscle---sparing lateral thoracotomy
4. Sternotomy
5. Clam---shell incision
6. Hemi---clamshell incision
7. Thoracophrenolaparotomy
8.Cervicotomies
Module 16 Pleural procedures MANDATORY
1. VATS with pleurodesis
2. VATS debridement for empyema
3. VATS for recurrent pneumothorax
4. Decortication for chronic empyema
5. Thoracostoma
6.Pleurectomy/decortication for mesothelioma
Module 17 Lung resection (open and VATS) MANDATORY
1. Wedge resection
2. Anatomic segmentectomy
3. Lobectomy
4. Bilobectomy
5. Pneumonectomy
6. Bronchoplastic and angioplastic procedures
7. Extended resections of the lung
8. Techniques for protection of the bronchial stump
9. Lymph node dissection
Module 18 Cervical Procedures MANDATORY

1. Lymph node biopsy and dissection
2. Endoscopic dilatation of the trachea and other procedures
3. Tracheostoma
4. Tracheal resection
5. Thyroidectomy
6. Zenker's diverticulum / cricopharyngeal myotomy
7. Esophagostomy
Module 19 Mediastinal procedures (Open and VATS) MANDATORY
1. Mediastinum (open and VATS)
2. Thymectomy for myasthenia gravis
3. Thymectomy for thymoma
4. Mediastinal lymph node dissection
5. Resection of intrathoracic goiter
6. Resection of bronchogenic cysts
7. Resection of neurogenous tumours
8. Procedures on the sympathetic chain
9. Vagotomy
10. Clipping/ligation of the thoracic duct
Module 20 Procedures on the chest wall and diaphragm MANDATORY
1. Correction of congenital chest wall malformation
2. Surgical stabilisation of flail chest
3. Chest wall reconstruction (prosthesis, implants and muscle flaps)
4. Thoracoplasty
5. Repair of a diaphragmatic hernia
6. Plication of the diaphragm
Module 21 Thoracic vascular techniques MANDATORY
1. Repair of an arterial or venous injury
2. Prosthetic replacement of subclavian artery or SVC
3. Patch repair of SVC or PA
4. Repair of atrial or ventricular wounds
Module 22 Oesophageal surgery (Open and minimally invasive) OPTIONAL
1. Oesophageal Resection: Transhiatal
2. Oesophageal Resection: Laparotomy---Right Thoracotomy
3. Oesophageal Resection: Laparotomy, Right Thoracotomy and Cervical Incision
4. Oesophageal Resection: Left Thoracolaparotomy

5. Oesophageal Resection: Minimally Invasive
6. Conduit preparation for oesophageal reconstruction
7. Repair of esophageal disruption
8. Palliative dilatation and stenting
9. Oesophagostomy
10. Abdominal access for upper GI procedures
11. Feeding gastrostomy and feeding jejunostomy
Module 23 Procedures for GERD OPTIONAL
1. Laporoscopic fundoplication
2. Transthoracic fundoplication
3. Dealing with the short esophagus
Module 24 Cardiopulmonary support for thoracic procedures OPTIONAL
1. Central and peripheral cannulation
2. Particularities of cardiopulmonary bypass (CBP)
3. Particularities of Extracorporeal membrane oxygenation (ECMO)
Module 25 Lung transplantation and alternatives OPTIONAL
1. Thoracic organ procurement and preservation
2. Lung transplantation
3. LVRS
4. Pulmonary endarteriectomy
5. Donor legislation
6. Donor types and selection criteria
7. Recipient selection criteria and transplant type
8. Perioperative surgical complications and management
9. Non---surgical complications
10. Long---term complications and outcome
11. Principles of post---operative care
12. Principles of immuno---suppression and prophylaxis of infections
13. Extracorporeal cardiopulmonary support pre/intra/post operative
14. EVLP
Module 26 Devices, implants and high technology MANDATORY
1. High---energy devices in the OR (Operating Room)
2. Video equipments in the OR
3. Hybrid operating rooms
4. Robotics

5. Vascular protheses
6. Additives for hemostasis and aerostasis
7. Implants for chest wall stabilization and reconstruction
8. Principles of tissue engineering and regenerative medicine