

Jordan University of Science and Technology

Faculty of Medicine 2018-2019

COURSE TITLE : RESPIRATORY SYSTEM.

COURSE CODE : MED 353.

CREDIT HOURS : 6 CREDIT HOURS

SEQUENCE : YEAR 3, 6 WEEKS

COURSE COORDINATOR: Dr. Nasr Alrabadi

CONTACT: nnalrabadi@just.edu.jo.

Course Description:

This course integrates all basic science disciplines in one system-based course to discuss respiratory system related topics. Each of the basic science departments is incorporated into an integrated body of knowledge covering anatomy, physiology, pharmacology, pathology, and microbiology. Also, Clinical implications for these information will be addressed by specialists in the clinical departments including internal medicine, surgery, and radiology. Goals of this course will be achieved via lectures, relevant laboratory sessions, seminars or small group discussions, and self-directed learning methods.

More specifically, respiratory system (RS)-related topics will be covered at first to provide basic knowledge and understanding of the structure, function of the respiratory system, biochemical basis of its function, as well as the pathological basis of respiratory disorders in the lungs and airways. Fundamental principles of basic medical sciences will be applied to pathological situations to distinguish the clinical basis for central respiratory system disorders.

During the course and whenever relevant the students are exposed to clinical problems to emphasize the explanations of symptoms, signs, investigations and forms of treatments. Practical sessions are planned to be stations around tables to give students the opportunity to expose their knowledge for discussion and confirm concepts learned in lectures. Small group discussions of clinical cases are planned at the end of the course were students are divided into small groups and with the help of an instructor they analyze and discuss the problem. Research ideas with specific embedded objectives are also included to emphasize social responsibility, evidence based medicine, community service, and innovative thinking.

Course Learning Outcomes

1. Identify and describe structures of respiratory organs, as well as their development, their histology and their blood supply.
2. Describe the mechanics of pulmonary ventilation and the major mechanisms involved in the regulation of respiration.
3. Explain how the respiratory gases are exchanged and carried throughout the body.
4. Identify various bacteria, viruses, parasites and fungal infections, which infect the respiratory tract and to understand principles of diagnosis, treatment, and prevention.
5. Identify and describe the major causes, pathogenesis, morphological changes, and complications of various disease processes which affect the respiratory tract.
6. Understand the major pharmacological principles, which provide the basis for the treatment of tuberculosis, cough, and bronchial asthma, as well as the pharmacology of anti-histamine drugs.
7. Identify the major risk factors which contribute to occupational diseases of the respiratory system and to understand their epidemiological pattern in the Jordanian community.

Recommended Textbooks and Atlases

Subject	Book (Resources)
Anatomy	<ul style="list-style-type: none"> ✚ Clinical Anatomy by Regions. By Richard S. Snell, 9th Edition. ✚ Grants Atlas of Anatomy or any other Atlas of Human Anatomy, Latest Edition. ✚ Basic Histology. By Junqueira, Latest Edition. ✚ · Before we are born. By Morre and Persaud, Latest Edition.
Physiology	<ul style="list-style-type: none"> ✚ Textbook of Medical physiology. By Guyton and Hall, Latest Edition. ✚ Human Physiology, from Cells to Systems. By Sherwood, Latest Edition.
Biochemistry	<ul style="list-style-type: none"> ✚ Textbook of Biochemistry with Clinical Correlations. By Thomas Devlin, 7th edition.
Pathology	<ul style="list-style-type: none"> ✚ Robbins Basic Pathology, 10th Edition. By Vinay Kumar, MBBS, MD, FRCPath, Abul K. Abbas, MBBS and Jon C. Aster, MD, PhD
Pharmacology	<ul style="list-style-type: none"> ✚ Lippincott's Illustrated Reviews: Pharmacology, 7th edition. ✚ Goodman and Gilman's: The pharmacological basis of therapeutics, latest edition. ✚ Articles that are recommended by the instructor
Microbiology	<ul style="list-style-type: none"> ✚ Sherris Medical Microbiology, Sixth Edition 2015, by Ryan KJ, Ray CG.
Community Med	Lecture Handouts.
Clinical Lectures	To be assigned by the lecturer.

Learning Objectives

(A) Lectures objectives

#	Lecture Title	Lecture Objectives
1	Introductory lecture	<ol style="list-style-type: none"> 1. Understand the general outline of the respiratory system module (MED 353). 2. Be familiarized with the modalities of teaching throughout the course. 3. Be familiarized with the grading system and passing requirements of the course. 4. Be introduced to the clinical implications of respiratory anatomy and physiology. 5. Be introduced to the basic pulmonary function testing and arterial blood gases in respiratory diseases.
2	Upper Respiratory Tract (Anatomy)	<ol style="list-style-type: none"> 1. Describe the structure of nasal cavity including nasal septum. 2. Describe the structure of lateral wall of nasal cavity including conchae and meatuses. 3. Locate the openings of the paranasal air sinuses and naso-lacrimal duct in the meatuses. 4. Describe nasal innervations, blood supply and its relation to epistaxis. 5. Study the structure of nasopharynx and associated openings with their clinical importance.
3	Pulmonary Ventilation (Physiology)	<ol style="list-style-type: none"> 1. Describe the mechanics of pulmonary ventilation. 2. Define pleural pressure, alveolar pressure and transpulmonary pressure 3. Describe changes in lung volumes, alveolar pressure, pleural pressure, and trans-pulmonary pressure during normal breathing. 4. Define compliance of the lungs. 5. Draw compliance diagram of the lungs in a normal person. 6. Describe the chemical composition and function of the surfactant. 7. Describe the significance of the major volume and capacities that are recorded during normal function test.
4	Lower Respiratory Tract (Anatomy)	<ol style="list-style-type: none"> 1. Describe the structure of various cartilages and membranes of the larynx. 2. Describe muscles of the larynx including their action, nerve and blood supply. 3. Describe the trachea including its relations and subdivision.
5	Pleura, lung and mediastinum (Anatomy)	<ol style="list-style-type: none"> 1. Define pleura and pleural cavity, and name its parts and recesses. 2. Discuss the pleural nerve supply. 3. Compare between right and left lungs by describing their lobes, fissures and surfaces. 4. Be familiarized with the bronchopulmonary segments of each lung.

		<ol style="list-style-type: none"> 5. Describe innervation, blood supply and lymphatic drainage of the lungs. 6. Identify different parts and contents of the mediastinum. 7. Study the origin, location, course and branches of the internal thoracic artery. 8. Define the surface markings of the trachea, lungs and pleura.
6	Alveolar ventilation (Physiology)	<ol style="list-style-type: none"> 1. Define alveolar ventilation. 2. List the factors that determine alveolar ventilation. 3. Understand differences between anatomic and physiologic dead spaces. 4. Describe the effect of dead space on alveolar ventilation. 5. Define rate of alveolar ventilation. 6. Describe the effects of alveolar ventilation on PCO₂ and PO₂.
7	Pulmonary circulation (Physiology)	<ol style="list-style-type: none"> 1. Compare the pulmonary and systemic circulations listing the main differences between them. 2. Describe bronchial circulation and the concept of physiological shunt. 3. Characterize pressures in the pulmonary system. 4. Describe blood flow through the lungs and its distribution.
8	Thoracic cage & Muscles of thoracic wall (Anatomy)	<ol style="list-style-type: none"> 1. Describe the shape and outline of the thoracic cage, including its inlet and outlet. 2. Describe the anatomical landmarks of the anterior chest wall. 3. List the various structures that constitute the thoracic wall. 4. Describe muscles of the thoracic wall including their nerve and blood supply as well as their actions. 5. Describe the characteristic features of the various parts of the thoracic vertebrae. 6. Describe the sternum and its joints. 7. Be familiarized with the classification of ribs, and their various parts as compared with each other. 8. Define intercostal spaces and discuss their various components including intercostal muscles. 9. Describe the diaphragm, its origin, insertion, and function, as well as its nerve and blood supply. 10. Study the openings in the diaphragm and the structures that pass through them.
9	Pulmonary infections I (acute, chronic & TB) (Pathology)	<ol style="list-style-type: none"> 1. Define pneumonia and pneumonitis. 2. Clarify pneumonias according to etiology & morphological patterns. 3. Compare & contrast bacterial & nonbacterial pneumonias. 4. Outline the events in the resolution of the pneumonic process. 5. List the possible complications of pneumonia. 6. Discuss the causes, morphology and outcome of lung abscess.
10	Pulmonary infections II (acute, chronic & TB) (Pathology)	<ol style="list-style-type: none"> 1. Define atypical pneumonia & discuss its etiology & pathology. 2. List the types of fungal & parasitic infections of the lung. 3. Be familiar with lung infections in the immunocompromised host. 4. Describe the pathology of pulmonary primary TB. 5. Describe the pathology of secondary TB 6. Describe the pathology of progressive TB 7. Describe the pathology of chronic pulmonary infections.

11	Histology of Respiratory Tract (Anatomy)	<ol style="list-style-type: none"> 1. Describe the microscopic structure of the upper respiratory passageway including the respiratory mucosa. 2. Correlate the structure and expected function of the different components of the nose and trachea. 3. Study the microscopic structure of the main bronchi and their subdivisions. 4. Study the microscopic structure of the lung parenchyma, and correlate this structure with gas exchange function.
12	Physical principles of gas exchange (Physiology)	<ol style="list-style-type: none"> 1. Appreciate the measurement of partial pressure of gases. 2. Define the factors which affect the rate of gas diffusion 3. Identify the respiratory membrane through which gases diffuse.
13	Ventilation-perfusion ratio (Physiology)	<ol style="list-style-type: none"> 1. Define the concept of ventilation – perfusion ratio. 2. Describe the effect of ventilation – perfusion ratio on alveolar gas concentration. 3. Define the concepts of physiologic shunt and physiologic dead space. 4. Characterize the pathophysiology of abnormal ventilation perfusion ratio. 5. Define the applications of oxygen hemoglobin dissociation curve.
14	The role of the respiratory system in maintaining acid-base homeostasis (Biochemistry)	<ol style="list-style-type: none"> 1. Describe the bicarbonate buffer system. 2. Describe the biochemical changes associated with respiratory acidosis and Alkalosis. 3. Describe the role of Hemoglobin in the buffer system.
15	Regulation of respiration: Neural and chemical control (Physiology)	<ol style="list-style-type: none"> 1. Locate and comment on the function of the dorsal and ventral groups of respiratory neurons, the pneumotaxic center, and the apneustic center in the brain stem. 2. List the effects on respiration that are mediated by the vagus nerves. 3. List the neural factors that affect the activity of respiratory center. 4. Describe abnormal patterns of breathing. 5. Describe cough and sneezing reflexes. 6. List the specific functions of the respiratory receptors in the carotid body, the aortic body, and in the ventral surface of the medulla oblongata. 7. Describe the effects of arterial PO₂, PCO₂ and PH on alveolar ventilation.
16	Bacterial infections I (Microbiology)	<ol style="list-style-type: none"> 1. Be familiarized with bacterial classification and characteristic properties. 2. Describe virulence factors, and pathogenesis. 3. Describe clinical presentation and differential diagnosis. 4. Describe laboratory diagnosis including specimen collection, culture techniques, and sensitivity to antibiotics. 5. Describe management including specific therapeutic agents. 6. Describe the epidemiology including modes of transmission, prevention & control measures.
17	Bacterial infections II (Microbiology)	<ol style="list-style-type: none"> 1. Describe bacterial classification and characteristic properties. 2. Describe virulence factors, and pathogenesis. 3. Describe clinical presentation and differential diagnosis.

		<p>4. Describe laboratory diagnosis including specimen collection, culture techniques, and sensitivity to antibiotics.</p> <p>5. Describe management including specific therapeutic agents.</p> <p>6. Describe the epidemiology including modes of transmission, prevention & control measures.</p>
18	Application of hemoglobin oxygen dissociation curve (Physiology)	<p>1. Calculate the affinities of hemoglobin by using P50 value.</p> <p>2. Understand the shape of this curve in anemia, and carbon monoxide poisoning.</p> <p>3. Describe the methods of calculations oxygen consumption in normal , anemic and carbon monoxide poisoning people.</p>
19	Bacterial infections III (Microbiology)	<p>1. Describe bacterial classification and characteristic properties.</p> <p>2. Describe virulence factors, and pathogenesis.</p> <p>3. Describe clinical presentation and differential diagnosis.</p> <p>4. Describe laboratory diagnosis including specimen collection, culture techniques, and sensitivity to antibiotics.</p> <p>5. Describe management including specific therapeutic agents.</p> <p>6. Describe the epidemiology including modes of transmission, prevention & control measures.</p>
20	Treatment of respiratory tract infections (Pharmacology)	Understand the pharmacokinetics, mechanisms of action, and adverse effects of the antibiotic classes commonly used in the treatment of upper and lower respiratory tract infections, including: penicillins, cephalosporins, fluoroquinolones, and macrolides.
21	Treatment of asthma and COPD (Pharmacology)	<p>1. Understand the general aims of therapy in bronchial asthma and COPD.</p> <p>2. Be familiarized with the concepts of bronchodilators versus long-term controllers in the management of asthma and COPD.</p> <p>3. Outline the specific mechanisms of action and the pharmacokinetic and pharmaco-dynamic properties of the following classes of drugs: Beta-2 agonists, Methylxanthines, Anticholinergic agents, Corticosteroids, Mast cell stabilizers, Leukotriene modifiers, and Oxygen.</p>
22	Clinical case	Covers clinical topics of SGD.
23	Fungal infections (Microbiology)	<p>1. Describe fungal classification and characteristic properties.</p> <p>2. Describe pathogenesis.</p> <p>3. Describe the clinical presentation and differential diagnosis.</p> <p>4. Describe laboratory diagnosis including specimen collection, and microscopic findings.</p> <p>5. Describe management including specific therapeutic agents.</p> <p>6. Describe epidemiology including modes of transmission, prevention & control measures.</p>
24	Anti-histamines & Anti-cough medications (Pharmacology)	<p>1. Review the concept of autacoids and their biological significance, with emphasis on histamine synthesis, storage, release, actions, and the clinical manifestations of histamine shock.</p> <p>2. Understand the mechanisms of action of anti-histamine drugs.</p> <p>3. Be able to classify, and understand the pharmacokinetics, uses, and adverse effects of anti-histamine drugs.</p> <p>4. Understand the pathophysiology of cough that is relevant to the pharmacological aspects of the treatment.</p> <p>5. Understand the sites of actions of anti-cough medications.</p>

		6. Understand the mechanisms of action, clinical uses, and adverse effects of codeine and dextromethorphan.
25	Biochemistry of oxygen radicals (Biochemistry)	1. Describe the production of free oxygen radicals and their intermediates. 2. Discuss the cell-based antioxidant defense mechanisms
26	Obstructive lung disease I (Pathology)	1. Define obstructive lung diseases. 2. Differentiate between OLD & RLD. 3. Subtype OLD.
27	Mycobacterium tuberculosis (Microbiology)	1. Describe bacterial classification and characteristic properties. 2. Describe virulence factors, and pathogenesis. 3. Describe clinical presentation and differential diagnosis. 4. Describe laboratory diagnosis including specimen collection, culture techniques, and sensitivity to antibiotics. 5. Describe management including specific therapeutic agents. 6. Describe the epidemiology including modes of transmission, prevention & control measures.
28	Obstructive lung disease II (Pathology)	1. Discuss the pathogenesis, pathological features, and possible complications of: Asthma, Chronic bronchitis, Bronchiectasis, and Emphysema. 2. Classify emphysema according to morphologic and etiologic patterns.
29	Restrictive lung disease I (Pathology)	1. Define restrictive lung disease. 2. Be familiar with the principles, cause & mechanisms in acute restrictive lung disease identifying Acute Respiratory Distress Syndrome in adults and newborn. 3. Discuss the pathology of idiopathic pulmonary fibrosis. 4. List the commoner cause of pulmonary fibrosis with emphasis on the pathology of Sarcoidosis.
30	Treatment of tuberculosis (Pharmacology)	1. Understand the concepts of TB treatment with special emphasis on the two phases of therapy; intensive versus continuation phases. 2. Understand the concept of combination therapy in the treatment of TB, particularly the advantages and disadvantages. 3. Describe the mechanisms of action, pharmacokinetics, uses, and side effects of first-line anti-TB drugs: Isoniazid, Rifampin, Ethambutol, and Pyrazinamide. 4. Understand the therapeutic use of second-line anti-TB drugs.
31	Restrictive lung disease II (Pathology)	1. Be familiar with causes and pathology of pneumoconiosis. 2. Identify causes and pathology of Asbestosis & Mesothelioma. 3. List the pulmonary hemorrhage syndromes, which may lead to pulmonary fibrosis.
32	Emerging respiratory tract infections Dr. Wail Hayajneh (Medicine)	1. Recognize cases of emerging upper respiratory tract infections. 2. Understand the genetic background of emerging upper respiratory tract infections. 3. Be familiarized with the historical aspects of emerging respiratory tract infections.
33	Surgical procedures for respiratory tract. Dr. Shadi Hammouri (Medicine)	1. Describe the clinical anatomy of respiratory tract. 2. Describe the surgical procedures used commonly.

34	Viral infections (Microbiology)	<ol style="list-style-type: none"> 1. Describe viral classification and characteristics properties. 2. Describe growth, multiplication, and pathogenesis. 3. Describe clinical presentation and differential diagnosis. 4. Describe laboratory diagnosis including specimen collection. 5. Describe management including specific therapeutic agents. 6. Describe epidemiology including modes of transmission, prevention & control measures.
35	Pre- and Post-natal Development of the Respiratory system (Anatomy)	<ol style="list-style-type: none"> 1. Describe the development of nasal cavity. 2. Describe development of the larynx. 3. Describe the development of lungs and bronchi. 4. Describe the development of the diaphragm.
36	Lung Tumors I (Pathology)	<ol style="list-style-type: none"> 1. Describe the etiology of lung cancer. 2. Distinguish between Small Cell Carcinoma & Non-Small Cell Carcinoma, and know the clinical & pathologic findings of the various types, together with their prognosis. 3. Be familiar with bronchial carcinoid. 4. Describe paraneoplastic syndromes associated with lung cancer. 5. List other tumors in the lung & know the commonest metastatic tumor.
37	Lung Tumors II (Pathology)	<ol style="list-style-type: none"> 1. List the diagnostic techniques used for respiratory disease. 2. Be familiar with pleural effusions pneumothorax & pleural tumors. 3. Identify nasal polyp, nasal papilloma & carcinoma. 4. Understand the etiology & pathology of nasopharyngeal carcinoma. 5. Describe laryngeal polyp, papilloma & carcinoma.
38	Epidemiology of acute upper respiratory tract infections and antibiotic use Prof. Anwar Bateiha (Community Medicine)	<ol style="list-style-type: none"> 1. Be oriented about the epidemiology of the common acute upper respiratory tract infections including distribution, risk factors, incidence, and prognosis. 2. Be introduced to the false beliefs related to acute upper respiratory infections. 3. Discuss the common use of antibiotics in acute upper respiratory infections. 4. Present the main findings of a clinical trial conducted at JUST about the effectiveness of antibiotics in acute upper respiratory tract infections.
39	Radiology Dr. Mwaffaq El-Heis (Medicine)	<ol style="list-style-type: none"> 1. Be introduced to the anatomical radiology of the respiratory system: ENT and pulmonary 2. Understand the radio-pathological correlation in respiratory diseases 3. Describe the radiological patterns of common respiratory illnesses 4. Describe the various radiological modalities in respiratory diseases, when and where.
40	Diagnostics (Microbiology)	Diagnostic tests for RS

(B) Labs objectives

#	Lab. Title	Objectives
1	Anatomy of URT, thoracic cage, thoracic wall and respiratory muscles. (Anatomy 1)	<ol style="list-style-type: none"> 1. Identify different parts of the nasal cavity. 2. Identify different parts of the larynx, i.e. laryngeal skeleton and membranes including vocal folds and cords, and laryngeal cavity, as well as muscles acting on the larynx. 3. Identify different parts of nasopharynx. 4. Identify different parts of the branching bronchial tree from the trachea to alveoli. 5. Identify different components and joints of the thoracic cage: inlet, ribs, sternum and thoracic vertebrae. 6. Identify principal respiratory muscles: intercostals and diaphragm (attachments, nerve supply and actions). 7. Identify accessory muscles of respiration and revise the mechanics of ventilation and various diameters of thoracic cavity. Identify different parts of pleura and its recesses. 8. Identify different parts of each lung and identify structures entering and leaving the hilum of the lung forming its root 9. Identify different parts and contents of the mediastinum. 10. Identify and carefully examine the radiological appearance of lungs, trachea, hilum, bronchial tree and skeletal structures (plain chest x-ray, bronchogram, CT scan and MRI).
2	Spirometry (Physiology)	<ol style="list-style-type: none"> 1. Define the different lung volumes and capacities and determine the amounts of these measurements in a spirogram. 2. Describe and perform the forced expiratory volume and maximum breathing capacity test and determine these measurements in a spirogram. 3. Explain how pulmonary function tests are used in the diagnosis of restrictive and obstructive pulmonary disorders.
3	Microbiology of the Respiratory System (Microbiology)	<ol style="list-style-type: none"> 1. Be familiar with selection, collection and transport of different respiratory clinical specimens (e.g. throat swab, & sputum) for microbiological examination. 2. Appreciate the value of staining methods as Gram, Acid-Fast, & other stains, and cultivation media for isolation of potential respiratory pathogens. 3. Understand types of hemolysis on blood agar plates, and other important biochemical reactions. 4. Be familiar with characteristic laboratory findings for identification of bacterial, fungal, & parasitic respiratory pathogens.
4	Histology of Respiratory Tract (Anatomy 2)	<ol style="list-style-type: none"> 1. Identify the microscopic structure of upper respiratory tract including nasal mucosa, larynx, nasopharynx and trachea. 2. Identify the microscopic structure of lung tissues and parenchyma. 3. Identify the microscopic structure of different parts of bronchial tree. Try to relate structure of each part to its function.
5	Web Path 1 (Pathology)	<ol style="list-style-type: none"> 1. Be familiar with the use of “Webpath” program in computerized pathology teaching and look up lung edema, congestion, thromboembolism, infarction, atelectasis and obstructive lung disease.

		2. Examine glass slides of pulmonary edema, congestion, atelectasis and emphysema.
6	Web Path 2 (Pathology)	1. Use Webpath to look up restrictive lung disease, pneumonias granulomatous diseases and tumors. 2. Examine glass slides showing pneumonias, tuberculosis, Hydatid cyst in the lungs, and carcinoma.

Course Assessment

Assessment		
Assessment Type	Expected Due Date	Weight
First Exam		--
Second Exam		--
Midterm Exam (Theory)		60
Evaluation		5
Quizzes		--
Research activity		5
OSCE		--
Mini-OSCE		--
Final Exam (Practical)		30
Final Exam(Oral)		--
Total		100

Students Learning Outcomes

Student Learning Outcomes (SLOs) (4-8 Maximum) Upon successful completion of this course, students should be able to:			
SLOs	Related ILO(s)* (numbers only)	Evaluation Criteria (MCQ, OSCE, Homework...)	
		Type of Criteria (MCQ, OSCE, Homework...)	Weight (%)
Describe the anatomical, biochemical and physiological basis for respiration in the human body.	1, 2	MCQ	30
Able to explain symptoms, signs, investigations, and forms of treatments of respiratory system's anomalies.	3, 4, 5, 6, 7	MCQ	30
Order and interpret results of relevant basic diagnostic procedures and apply safe and accurate methods of pharmacotherapy of major disease states.	8, 9	MCQ, SGD	15
Critically appraise research studies guided by evidence-based medicine and demonstrate ability to work in diverse settings and communities.	10, 11	MCQ, Homework	25
			100

Intended Learning Outcomes (ILOs)

- 1) Demonstrate a sufficient understanding of the structural organization and functions of the following systems of the human body: circulatory, respiratory, gastrointestinal, endocrine, hematopoietic & lymphatic, musculoskeletal, nervous, and genitourinary systems.
- 2) Conceptualize the cellular, molecular, genetic, and biochemical mechanisms that maintain body's homeostasis and their derangements in disease states.
- 3) Apply their knowledge of human anatomy and function to solve questions regarding major clinical cases and diseases.
- 4) Attain appropriate and systematic clinical history of different medical conditions and settings.
- 5) Demonstrate proficiency in performing clinical skills and procedures.
- 6) Perform relevant physical examination on patients professionally and ethically.
- 7) Identify the major signs and symptoms of disease states, recognizing risk factors and etiologies, in an interdisciplinary approach to differentially diagnose patients.
- 8) Order and interpret results of relevant basic diagnostic procedures, such as laboratory investigations and conventional imaging procedures.
- 9) Apply safe and accurate methods of pharmacotherapy of major disease states.
- 10) Critically appraise research studies guided by evidence-based medicine.
- 11) Demonstrate ability to work in diverse settings and communities.