

**Content of „The Human Body; An Introduction to Structure and Function” modified for
EXAM REQUIREMENTS**

**Those parts that are not crossed through, are required
Additional requirements listed separately**

**~~1-2 Biology of the Cell, Genetics and
Evolution 1-66~~**

3 Tissues 67

Epithelial Tissue 68
Surface Epithelia 68
Glandular and Sensory Epithelia 72
Connective and Supporting Tissues 72
Connective Tissue 73
Supporting Tissue 78
Muscle Tissue 85
Smooth Muscle Tissue 86
Striated Muscle Tissue 87 **(NOT: 91-96)**
Nerve Tissue 97
The Neuron 97
~~The Nerve Impulse (Action Potential) 100~~
~~The Synapse 101~~
The Glia Cells (Neuroglia) 105
The Nerves 106

**4 The Locomotor System (Musculoskeletal
System) 113**

Axes, Planes, and Orientation 114
Axes and Planes of the Body 114
Nomenclature of Positions and Directions 114
General Anatomy of the Locomotor System 116
The Bones 116
The Joints 117
Function and Structural Principles of Skeletal
Muscle 123
The Tendons 127
Auxiliary Structures of Muscles and Tendons 127

**The names of the main bones, and the main
parts of the following joints: shoulder,
elbow, wrist, hip, knee, ankle are required.**

Following figures are required:

**4.9, 4.10, 4.15, 4.34b, 4.35, 4.45, 4.51, 4.52,
4.56**

**~~Special Anatomy of the Locomotor System
129 - 196~~**

Summary - 197

5 The Heart and Blood Vessels 205

The Heart (Cor) 206
Shape and Position 206
Structure of the Heart 208
The Conduction System 214
The Coronary Vessels 215
Systole and Diastole 216

Cardiac Output 218
Nerve Supply of the Heart 218
Heart Sounds and Heart Murmurs 219
Resting and Action Potential of the Heart 220
– Differences between Cardiac and Skeletal
Muscle 221
**~~The Electrocardiogram (ECG), Blood Pressure,
Examination of the Heart 221-226~~**
The Vascular System—Structure and Function
228
The Blood Vessels: Arteries, Veins, and
Capillaries 228
– The Structure of Arteries and Veins 228
– Structure of the Capillaries 229
Lymph Vessels 229
Systemic and Pulmonary Circulation 231
The Fetal Circulation 234
The Arterial System 234
The Venous System 238
**~~The Vascular System—Physiological
Principles 244-251~~**
Summary - 252

**6 Blood, the Immune System, and Lymphoid
Organs 259**

The Blood 260
Functions of the Blood 260
The Cells of the Blood 262
– The Erythrocytes 262
– The Leukocytes 263
– The Platelets 266
**~~Blood Groups and Blood Transfusions, The
Plasma, The Erythrocyte Sedimentation
Rate (ESR), O₂ and CO₂ Transport in the
Blood, The Anemias, The Regulation of
Erythrocyte Generation, Hemostasis and
Coagulation 266-281~~**
The Immune System 282
~~Nonspecific Immunity 282~~
~~Specific Immunity 283-287~~
The Lymphoid Organs (Immune Organs) 287
The Thymus 290
The Lymph Nodes 291
The Spleen (Splen, Lien) 293
Lymphoid Tissues of the Mucous Membranes
295
Summary - 299

7 The Endocrine System (whole) 307-332

8 The Respiratory System 333

The Path of Oxygen to the Cell: External and Internal Respiration 334

Organs of the Air Passages 335

Nasal Cavity and Paranasal Sinuses 335

Pharynx 339

Larynx 339

The Windpipe and Bronchial Tree 344

Serous Cavities and Membranes of the Chest and Abdomen 348

Lungs (Pulmones) 348

Visceral and Parietal Pleura 350

External Structure of the Lung 350

Internal Structure of the Lung 350

~~Ventilation of the Lungs, Gas Exchange and the Blood-Air Barrier, The Regulation of Breathing, The Mechanics of Breathing 353-370~~

Summary - 370

9 The Digestive System 377

~~Metabolism, Energy Requirements and Nutrients 378-389~~

The Digestive Organs 389

The Oral Cavity 389

The Throat (Pharynx) 400

The Gullet (Esophagus) 402

The Stomach (Ventriculus, Gaster) 404

The Small Bowel (Intestinum Tenue, Enteron) 407

The Large Bowel (Intestinum Crassum) 414

Relations of the Peritoneum and Mesenteries of the Abdominal Organs 418

The Pancreas 421

The Liver 423

The Gallbladder (Vesica Biliaris) and Bile Duct 426

~~Overview of the Digestive Processes 428-440~~

Summary 433

10 The Kidneys and Urinary Tract 441

Role of the Kidneys 442

Overview of Structure and Function of the Kidneys 442

The Kidney (Ren, Nephros) 443

Shape and Position 443

Renal Cortex and Renal Medulla 446

The Renal Vessels 448

The Renal Corpuscles and the Glomerular Filter 448

– Properties of the Glomerular Filter 450

~~Glomerular Filtration, Renal Tubules and Collecting Ducts, Composition of Urine 450-457~~

Urinary Tract 457

Renal Pelvis 458

Ureter 458

Urinary Bladder (Vesica Urinaria) 459

Urethra 463

Summary - 465

11 The Reproductive Organs 471

Function and Structure of the Reproductive Organs 472

Male Reproductive Organs 472

Overview 472

Testis (Orchis) 474

Epididymis 477

Vas Deferens 478

Seminal Vesicles (Vesiculae Seminales) 478

Prostate Gland 479

Cowper's Glands (Bulbourethral Glands) 481

~~Composition of... Castration and... 481~~

External Male Sex Organs 481

– Scrotal Sac (Scrotum) 482

– Penis (Male Member) 482

~~Erection, Ejaculation 484~~

Female Reproductive Organs 485

Overview 485

Ovaries 486

The Menstrual Cycle 492

Fallopian Tube (Uterine Tube, Salpinx) 493

Uterus 494

Vagina 495

External Female Sex Organs (Vulva) 496

The Female Breast (Mamma) and Mammary Gland 497

Summary - 499

12 Reproduction, Development, and Birth 505

Germ Cells 506

Fertilization 506

– Sex Determination 509

Transport through the Uterine Tube and Segmentation 511

Implantation and Development of the Placenta (Afterbirth) 513

Structure of the Placenta 514

Umbilical Cord (Funiculus Umbilicalis) 516

Development of the Embryo 516

Derivatives of the Germ Layers 518

Evolution of the Body 519

~~Development of the Fetus, Birth, Postnatal Development 520-528~~

Summary - 528

13 The Central and Peripheral Nervous Systems 533

Classification of the Nervous System 534

Role of the Nervous System 534

Development of the Nervous System 535

Central Nervous System 536

Development and Organization 536

The Brain (Encephalon) 538

– Cerebrum or Forebrain (Telencephalon) 538

~~– Diencephalon, Midbrain– Pons, Cerebellum, Medulla Oblongata, Brainstem ... 548–556~~

Spinal Cord (Medulla Spinalis) 557

– Spinal Nerves 558

– Gray and White Matter of the Spinal Cord 561

~~Ascending and Descending Tracts of the~~

~~Spinal Cord, Voluntary Motor Tracts~~

~~(Pyramidal Tracts), Extrapyramidal Motor~~

~~System, Spinal Reflexes 563–572~~

Membranes of the Brain and Spinal Cord 573

– Membranes of the Brain 573

– Membranes of the Spinal Cord 574

Cerebrospinal Fluid (CSF) and the Ventricular System 576

– CSF Drainage 578

– Lumbar Puncture 578

~~Blood Supply of the Brain 578~~

Peripheral Nervous System 584

Peripheral Nerves 584

Ganglia 584

Spinal Nerves 585

Networks of Nerves (Plexus or Plexuses) 585

– Cervical Plexus 586

– Brachial Plexus 586

– Lumbar Plexus 589

– Sacral Plexus 589

Cranial Nerves 589

14 The Autonomic Nervous System 605

Function and Components 606

Outline of the System 608

Sympathetic Nervous System 609

Function 609

Structure 610

Postsynaptic Receptors on Effector Organs 613

Parasympathetic Nervous System 613

Function 613

Structure 614

Cranial Parasympathetic System 614

Sacral Parasympathetic Outflow 616

Nervous System of the Intestinal Wall 616

15 Sense Organs 623

Receptors and Sensory Cells 624

The Eye 625

The Eyeball (Globe, Bulbus Oculi) 625

Anterior and Posterior Chamber of the Eye 627

Intraocular (inside the eye) Pressure 628

Lens and the Process of Accommodation 628

Iris and Pupillary Reflexes 629

Cornea 630

Sclera 630

Vascular Tunic (Uvea) 631

Retina 631

Rods and Cones 633

Optic Disk (Discus Nervi Optici) 633

Macula Lutea (Yellow Spot) 634

Eye Ground (Fundus) 635

The Optic System 635

~~Nearsightedness 636~~

~~Farsightedness 636~~

~~Astigmatism 637~~

Visual Acuity 638

The Visual Pathway 639

Visual Field Defects 639

Accessory Structures 641

The Ear 644

The Organ of Hearing 645

Hearing Problems 651

The Organ of Equilibrium 651

The Sense of Taste 654

The Sense of Smell 655

16 The Skin and Its Appendages 663

Skin (Cutis) and Subcutaneous Tissue (Tela Subcutanea) 664

Layers of the Skin 664

Sensory Organs of the Skin 667

Tasks of the Skin 667

Skin Appendages 668

Glands of the Skin 668

Hair 669

Nails 670