



TEHRAN UNIVERSITY  
OF  
MEDICAL SCIENCES

**School of Nursing and Midwifery**



**M.Sc. in Neonatal Intensive Care Nursing**

**(General specifications, plans, and headlines)**

## Section I

**Title: Neonatal Intensive Care Nursing**

**Degree: M.Sc.**

### **General competencies**

Communication skills, interviewing, reporting, critical thinking, professionalism as well as:

- Concepts and theories in nursing
- Evidence-based practice
- Research methodology in nursing
- Statistics for nursing research

### **Specific Competencies and Skills (Special Qualifications)**

- To deliver skilled and evidenced-based nursing care and intervention for patients who need intensive care.
- To assess patients non-invasively and help invasive assessment of patients in neonatal intensive care units.
- To interpret and analyze clinical data
- Acquiring-qualifications for conducting applied researches and employing the findings to solve nursing problems in the care of patients.

### **The Terms and Conditions of Admission to the Course**

- Holding a BSc degree in nursing received in Iran or abroad
- Participating in the national Master's entrance exam and becoming qualified
- Being mentally and physically healthy

### **Educational Strategies, Methods, and Techniques**

**Educational Strategies:** task-based learning blended learning (teacher-centered and student-centered), blended learning (attendance and DLN), problem-based learning, professional competency-based learning, and evidence-based learning

**Methods and Techniques:** lecture (question and answer, video clip), journal club, case presentation, discussions in small groups, seminars and conferences, site visits (for example, Nursing Office of the Tehran University of Medical Sciences, and Iranian Nursing Organization), and clinical and managerial practice in health care fields

## Student Assessment

Written assessment [multiple choice questions (MCQ), essay (restricted and extended answer)], oral assessment (unstructured and structured oral exams), interactive computer test, and practical assessment (projects, portfolio, and logbook, lab observations)

## Numbers and Types of Credits and Tables of the Courses

Prerequisite courses: 4 credits

Core courses: 28 credits

Dissertation: 4 credits

Total number of credits: 32

**Table 1 - Prerequisite Courses**

Course code	Course title		Credits				Total hours					Requirement
			Theoretical	Practical	Practicum	Internship	Total	Theoretical	Practical	Practicum	Internship	
01	Advanced statistics and research methodology	2	1	-	-	3	34	34	-	-	68	-
02	Information technology in health care system	0.5	0.5	-	-	1	8	17	-	-	25	-

Code of course	Course title	Credits				Requirement
		Theory	Practical	Placement	Total	
03	An introduction to neonatal intensive care nursing	3			3	
04	Theories and advanced concepts of neonatal nursing	2	-	-	2	-
05	Fundamental of management and leadership	2	-	-	2	

	theories					
06	Neonatal anatomy and physiology	2	-	-	2	
07	Neonatal physiopathology	1	-	-	1	
08	Neonatal clinical pharmacology	1	1		2	
09	Fundamentals of neonatal nursing care (1)	1		2	3	
10	Fundamentals of neonatal nursing care (2)	2		2	4	
11	Fundamentals of advanced neonatal nursing care (1)	2		2	4	
12	Fundamentals of advanced neonatal nursing care (1)	2		2	4	

#### \*M.Sc. Dissertation Proposal

The thesis proposal describes the rationale for the proposed research, and outlines its basic components. The proposal is submitted to the department's research committee members (consisting of a dissertation advisor, department's head, and the department education and research representatives) for the final evaluation and approval.

#### **Dissertation Defense**

The student and the thesis committee are required to comply with the guidelines of the School of Nursing and Midwifery with regard to the presentation of the thesis and meeting the deadlines for graduation. During the viva, the jury committee will thoroughly examine the student's knowledge in the related area of the research.

#### **Ethical issues**

The graduates should:

- Observe the Patient's Bill of Rights<sup>1</sup> when working with the patients.
- Strictly observe Biosafety and Patient Safety Rules\* concerning the patients, personnel and workplace.
- Observe the Rulebook for Dress Code<sup>2</sup>.
- Strictly observe the Regulations of Working with the Laboratory Animals<sup>3</sup>.
- Carefully preserve resources and equipment.

- Truly respect faculty members, the staff, classmates, and other students as well as creating a cordial and respectful atmosphere.
- Observe social and professional ethical considerations in constructive criticism.

1, 2, and 3 are contained in the Enclosures.

\* Biosafety and Patient Safety Rules will be set out by the educational departments and will be available to the students.

## Section II

**Title of the course: Computer and Medical Information System**

Code of the course: 01

Number of credits: 1

Type of the course: theoretical- practical

Prerequisite: -

**Principal objectives of the course:**

- An overview of concepts
- Methods of using software
- Gaining skills and the use of them

**Main topics: (9 hours theoretical - 17 hours practical)**

- Concepts and basis of data technology
- Clinical database systems in hospitals
- Principle of binary language
- Data processor system (input, CPU, output)
- Overview of library systems
- General overview of hardware
- Operating systems (General; Linux-Dos, Windows: introducing items-application)
- Overview and application of important software ( Word, Excel, Photoshop, PowerPoint)
- Overview of internet
  - ✓ History and definition of internet
  - ✓ Overview of internet applications and services
  - ✓ E-mail
  - ✓ News groups
  - ✓ World wide web
  - ✓ Search engines
  - ✓ Browsers
  - ✓ How to conduct a search in internet
  - ✓ Databases in internet
  - ✓ Types of languages in internet and overview of Telecare, Telemedicine
- Internet search
  - ✓ Principles of search, pubmed, finding full text of articles, designing search strategy, types of effective search in Principal references and identifying databases related to medical science, how to communicate via internet
- Main principles of solving windows' errors

Principal references:

1. Nicoll LH. Computers in nursing's, nurses' guide to the internet. Lippincott Williams and Wilkins, Last Ed.
2. Cullen R. Health information on the internet: A study of providers, quality, and users. Praeger Paperback, Last Ed.

**Student assessment practices**

Assessment methods include objective, continuous, student centered multidimensional, and performance, evaluations.

**Title of the course: Advanced Statistic and Research Methodology**

Code of the course: 02

Number of credits: 3 credits

Type of the course: theoretical

Prerequisite: -

Principal objective of the course:

An overview of concepts, methods of conducting research in medical sciences, and gaining skills in designing a research and conducting it in order to design a research project and analyze others' research.

Main topics: (43 hours theoretical, 17 hours practical)

Advanced statistic

- Basic concepts and definitions: variable and dispersion, central tendency indices, indices of dispersion and distribution, systematic error, parameters and accuracy title
- Designing charts: histogram, line chart, scatter, overlay
- Change of variables and outliers: change of common variables, outliers
- Prediction and evaluation of a hypothesis: statistical prediction and confidence interval, testing a hypothesis, comparing mean and variance of two samples together, estimate the ratios in two paired and non-paired samples
- Regression: basic flat regression, estimate regression's parameters, testing the hypothesis of regression's parameters, comparing two regression lines together, inverted regression
- Variance analysis: one way variance analysis, post variance analysis comparisons
- Applicable discussions according to students' selection and their thesis' proportion for group work

A. Method of modern research

- An overview on principle of research method
- Overview of research (history, definitions, types of quantitative research, choosing subject)
- Theoretical-assumptive framework, an overview on studies and methods of using Principal references
- Aims, questions, theories, assumptions, research limitations
- Methods and materials including (society, sample and types of sampling, research environment, variables and measuring scales, methods of data collection, credibility



and tools' trustworthiness, data display, data principal references, statistical methods of data analysis, ethical values in research).

- Conclusion and suggesting the use of findings and further research
- An overview on qualitative studies
- How to arrange a research project
- Principles and research analysis

Principal references:

1. Wood, GT. Nursing research method, Critical Appraisal Utilization. Mosby, Last Ed.
2. Poilt DF, Hungler BP. Nursing research: principles and methods. Lippincott Williams and Wilkins, Last Ed.
3. Varkevisser CM, Pathmanathan CM. Designing and conducting health system research projects. KIT publishers, Last Ed.
4. Szklo M, Nieto FN. Epidemiology beyond the basics. Massachusetts: Jones and Bartlett publisher, Last Ed.
5. Mohammad K, Malekafzali H, Nahaptian V. Statistical methods and health indexes. Last Ed.
6. Other books and journals regarding nursing research.

Student assessment practices:

- Continuous and final evaluations
- Evaluation of student's performance in the class
- Evaluation of homework, seminars, group, and solo activities
- Presenting and conducting a research project

**Title of the course: An Introduction to Neonatal Intensive Care Nursing**

Code of the course: 03

Number of credit: 3

Type of the course: theoretical

Prerequisite: -

Principal objective of the course:

At the end of the course, students will be familiar with the importance of clinical policy making from newborn to two years, clinical indexes, principle of optimal care of infant, levels of infant's care, and nursing role and responsibilities in neonatal intensive care units, the process of nursing care in neonatal intensive care and concepts related to holistic care of infant and family.

Main Topics: (51 hours)

1. Concepts of neonatal medicine and perinatology
  - Fetus and infant
  - Uterine livable age
  - Premature and mature infant
  - Premature delivery and determining the age of pregnancy
  - Definitions of death during infancy, suckling, and perinatal
  - Underweight infant, normal weight, and overweight in comparison to uterine age
  - Categorizing infants according to weight
2. Health policies, health economy and future directions
  - 1404 (2025) horizon and place of Iran in the region
  - Millennium aims and paying attention to achieve fourth and fifth goals regarding the improvement of country's mothers and infants' health
  - Health management and its costs
  - Increasing the number of neonatal intensive care beds and the number of ill and premature infants that require hospitalization
  - The efficient use of available principal references
  - The cost of neonatal intensive care beds efficacy
  - Expanding the position of neonatal and perinatal intensive care in modern medicine

- Ever advances of medicine, nursing and basic sciences
3. The position of neonatal and perinatal science
    - National statistic comparing to the world's
    - History of Iran and the world
    - Causes of mothers and infants mortality
    - The importance of paying attention to mothers and infants mortality in society's health indexes
  4. The need for neonatal intensive care nursing master degree
    - The programs specification
    - The birth statistic
    - The uterine death and premature and underweight birth statistic
    - Increasing number of neonatal intensive care beds
    - The importance of experienced nurse in neonatal intensive care nursing
    - The shortages and urgent need
  5. The importance of grad service delivery in the improvement of mother and infant's health
    - Close relationship between mothers and infants
    - The history of grading in the world
    - Grading and economy
    - Grading and optimal care and service
    - Principle of grading
    - The structure of service delivery in grading
  6. Levels of care in neonatal medicine
    - Level 1
    - Level 2
    - Level 3
    - Standards and structure of levels in neonatal care (structure, space, equipment, personnel)
    - Correct perception of types of infants in need of intensive care
    - Correct perception of the time to discharge infants from intensive care

- Correct perception of transferring infants in the case of crisis, shortage of beds, and priorities
  - Neonatal intensive care medicine economy
7. Health centered policies and future direction
- The policy making for infants' health up to 2 years (vaccinations)
  - National programs for health improvement of mothers and infants, child and infants' vaccinations
  - The role of neonatal intensive care nurse in the improvement of infant and family's health, and neonatal intensive care nursing policy making
  - Participation in neonatal intensive care nursing policy making
  - Society and the role of neonatal intensive care nurse
8. Nursing process in neonatal units and main needs of infants and families
- Holistic nursing
  - Family centered care
  - Nurses' role in the care of infant and family
9. The professional role of neonatal intensive care nurse
- Clinical roles: clinical skills related to infants, ability to mix different capabilities, critical thinking
  - Scientific roles: scientific thinking and evaluating, using scientific lessons, correct understanding of evidence based care
  - Educational roles: the role of neonatal intensive care nurse and a teacher and learner, and lifelong self-learning, different in-service learning activities, theoretical, clinical educational courses and workshops, participation in national, regional and international gathering, performance based on neonatal intensive care nursing profession, participation and continuous positive view of nursing profession, participation and continuous positive view of neonatal intensive care nursing profession, conflict resolution in neonatal intensive care units, determining professional boundaries between neonatal doctors and nurses, and compliance with medical confidentiality regarding infants and families, identifying and resolving disputes and conflicts, appropriate clinical and scientific relationship with MDT members
10. Management and evaluation of infection control in neonatal intensive care units
- Infection assessment and early detection of infection outbreak
  - Methods of reducing infection in the environment
  - Principles of infection control

- Policy making regarding infection control
- Methods of maintaining principles of infection control
- Identifying behavioral habits and hazardous situation in the spread of infection
- Dangerous behaviors in the spread of infection to own self, infants, caregivers and visitors
- Correct human and environmental sampling to identify causes of infection epidemic
- The separation rules in neonatal intensive care units

#### 11. Neonatal intensive care unit's management and organization

- Vigilance in hazardous situations
- Improvement and quality control (improvement and expansion of professional nursing role in neonatal intensive care units, and environmental observation)
- General environment hygiene of neonatal intensive care units
- Walking in neonatal intensive care unit with contaminated and clean space
- Cleanness and correct arrangements of medical equipment in neonatal intensive care unit
- Accessibility to all equipment
- Routine checkup of equipment and their calibrations

#### 12. Legal issues

- Process of nursing care
- Professional insurance
- Duties and responsibilities
- Care standard
- How to respond to errors and mistakes in the unit
- Documentation
- Obtaining consent
- Professional nursing insurance

#### 13. Patient safety in neonatal intensive care unit

- Structure of safe nursing care in neonatal intensive care unit
- Errors and mistakes in neonatal intensive care unit (reporting and documentation, reducing human error in the unit, encouraging policies, self-reporting system in

the reduction of error and quality improvement, system observation and improving quality of service, nursing role and management in the improvement of nursing care and reduction of error, internet Principal references in reducing error)

14. Legal and ethical views in neonatal care

- Infant and family's rights
- Ethical principles
- How to respond to legal issues
- Caring for infant at the end stages
- Caring for infant and family in the end stages

15. Psycho-social support of neonatal intensive care unit

- The importance of connection
- Principle of connection and information in neonatal intensive care unit
- Social worker and family support
- The role of neonatal intensive care unit nurses in psycho-social support

16. Research in neonatal intensive care unit

- The role of neonatal intensive care unit nurses in research
- IT skills and the use of information sources
- Principles of research
- The role of nurses in practical research
- Improvement of nursing knowledge through research
- Ethical considerations in research

**Principal references:**

1. Verklan MT, Walden M. Core curriculum for neonatal intensive care nursing. Saunders, Last Ed.
2. The latest national statistical indexes
3. The program of 1404 horizon
4. Millennium goals of WHO and UN
5. National vaccination program for children and infants
6. National program for improvement of mother and infant's health

**Student assessment practice:**

Written exam, homework and conducting seminar

**Title of the course: Theories and Modern Concepts of Neonatal Nursing**

Code of the course: 04

Number of credit: 2

Type of the course: theoretical

Prerequisite: -

Principal objective of the course:

At the end of this course, students will be able to use assumptive patterns and concepts in the design of program for clients, and in relation to education, they can teach these concepts to learners.

Main Topics: (34 hours)

1. Nursing process and its fundamental theories, general theoretical of systems, theoretical of human's main needs
2. Family centered care
3. Society and the role of nurse
4. Psychosocial support
5. The role of nursing in providing, maintaining and improving health
6. Theorizing in nursing, initiation of assumptive patterns and introducing main patterns
7. Mental health
8. Natural respond and coping patterns
9. Child rearing
10. Child birth and family
11. Infant and family psychology
12. Association and affiliation
13. Biological rhythms
14. Sleep
15. Pain
16. Touch
17. Human territory
18. Death and mourning
19. Human's mental image of self-body
20. Lack of sensory senses and over receiving them



21. Growth and evolution

22. Pain management and rehabilitation

Principal references:

1. Deghannayeri N, Jalalinia F. nursing theorizing and theories. Tehran
2. Taylor C, Lilis C. Fundamentals of nursing. Last Ed. Lippincott Williams and Wilkins

Student assessment methods:

Written exam, homework and seminar

**Title of the course: Principles of Nursing Management and Leadership Theories**

Code of the course: 05

Number of credit: 2

Type of the course: theoretical

Prerequisite: -

Principal objective of the course:

At the end of this course, students should be able to use theories of organizational management in the context of general nursing and its evolution, and identify different leadership theories regarding required leadership role and behavior in organizations.

Main Topics: (32 hours)

1. Foundation and principle of classic management
2. Foundation and principle of behavioral management
3. Foundation and principle of management science, scientific framework for decision making
4. Foundation and principle of new management (network)
5. Crisis management
6. Leadership theories
7. Character and behavior of leader
8. Leadership and social power
9. Relationship between leader and followers
10. Relations and support process
11. Power and choice
12. Philosophy and goals in nursing
13. Efficient use of Principal references
14. In-service training and re-learning
15. Providing, maintaining and improving health
16. Assessment and evaluation (in nursing practice)
17. Standards and nursing accounting
18. Budget and hospital economy
19. Human Principal references
20. Duty designations

21. Crisis management
22. Quality control management
23. Management and designing information system

Principal references:

1. Sayyed Ahmadi M, Zekavati R, Mosavi F. foundation and principle of nursing management
2. Stephanie Robins. Organizational behavior- concepts, theories and approaches
3. William depender and angelica chandler. Clinical ethic: theoretical and approaches of clinical ethic in health
4. Huber D, Nagelkerk J. Leadership and nursing care management. Saunders Elsevier, Last Ed
5. Finkelman A, Kenner C. Professional Nursing Concepts: Competencies for quality leadership, Jones and Bartlett Publisher, Last Ed

Student assessment methods:

Written exam, homework, seminar

**Title of the course: Infant's Anatomy and Physiology**

Code of the course: 06

Number of credit: 2

Type of the course: theoretical

Prerequisite: -

Principal objective of the course:

To expand students' knowledge in basic sciences (anatomy, physiology and embryology) which is in direct connection with infants' health, and preparing students to gain experiences of different problems of ill infants' organs.

Main Topics: (theoretical, 34 hours)

1. Pregnancy process and physiology of pregnant mother
2. Fetus anatomy and physiology and pre-birth period
3. Fetus anatomy and overall infant physiology and difference with adult age
4. Anatomy and physiology of cardiovascular system
5. Anatomy and physiology of respiratory system
6. Anatomy and physiology of digestive system and infant feeding (with an emphasis on mother's milk feeding)
7. Anatomy and physiology of renal system and fluid and mineral balance
8. Anatomy and physiology of urinary and sexual organs
9. Anatomy and physiology of endocrine system and metabolism
10. Anatomy and physiology of blood circulatory system
11. Anatomy and physiology of immune system and infectious diseases
12. Anatomy and physiology of nervous system
13. Anatomy and physiology of ENT , eye system
14. Anatomy and physiology of skin

Principal references:

1. Blackburn S. Maternal, fetal, and neonatal physiology: A clinical perspective (Maternal fetal and neonatal physiology). Saunders, Last Ed
2. Verklan MT, Walden M. Core curriculum for neonatal intensive care nursing. Saunders, Last Ed
3. Wong DL, Wilson D, Ahmann E. Whaley and Wong's Nursing care of infants and children. Mosby-Year Book, Last Ed

4. Wong DL. Whaley and Wong's essentials of pediatric nursing. Mosby-Year Book, Last Ed

Student assessment methods:

Mid-term and final written exam

**Title of the course: Infant's Physiopathology**

Code of the course: 07

Number of credit: 2

Type of the course: theoretical

Prerequisite: infant's anatomy and physiology

Principal objective of the course:

to expand students' knowledge of basic sciences (pathophysiology, examination of health status and its relationship with diseases and effects of environmental factors and genetic on infant's health) which is in direct connection with infants' health, and preparing students to gain experiences of different problems of ill infants' organs and follow-ups in health centers

Main Topics: (theoretical, 34 hours)

1. Fetus physiology and pre-birth time
2. Effect of birth on fetus
3. Adapting to outside uterus life
4. Thermoregulation
5. Abnormal activities of organs and tissues and their relationships with diseases
6. Influential factors in diseases and special circumstances
7. Pathophysiology of the diseases and common problems during infancy (cardiovascular system, respiratory system, digestive system and feeding, renal system and fluid mineral balance, urinary and sexual organs, immune system and infectious diseases, endocrine system and metabolism, blood circulatory system, nervous system, Ent , eye system, skin)

Principal references:

1. Verklan MT, Walden M. Core curriculum for neonatal intensive care nursing. Saunders, Last Ed
2. Wong DL, Wilson D, Ahmann E. Whaley and Wong's Nursing care of infants and children. Mosby-Year Book, Last Ed
3. Wong DL. Whaley and Wong's essentials of pediatric nursing. Mosby-Year Book, Last Ed

Student assessment methods:

Mid-term and final written exam

**Title of the course: Infant's Clinical Pharmacology**

Code of the course: 08

Number of credit: 2

Type of the course: theoretical and practice

Prerequisite: infant's physiopathology

Principal objective of the course:

At the end of this course, students will be familiar with medications' effects, side effects, and principles of nursing care, as well as how to prepare sensitive drugs in neonatal intensive care unit, and teaching families the correct use of medication, preparing injectable IV medications.

Main Topics: 17 hours theoretical and 34 hours practical

Theoretical:

1. Principles of pharmacology
  - Terminology of pharmacology
  - Observation of medications' effects
  - General concepts of pharmacology and pharmacodynamics
2. Categorization of medications (including definitions, principles of the use of each medication and special circumstances of infancy period)
  - Antibiotics
  - Respiratory medications
  - Cardiac medications
  - Central nervous system medications
  - Diuretics
  - Safeguarding
3. The application of clinical pharmacology in neonatal intensive care nursing
  - Paying attention to special circumstances of infancy period
  - Special diseases and drug's metabolism
  - Special drugs' calculation
  - Knowing dosage and how to administer the medications
4. Observation of medication

- Observation, nurse's role in drug's observation in intensive care units and prevention of medication's side effects, principles of documentations and reporting drug's side effects
5. Principle of preparing parental IV feeding solution
    - The importance of parental feeding in critically ill and premature infants in intensive care unit (main parental feeding discussion will be presented in principle of neonatal care course), how to administer (peripheral, central rout), preparation, nursing observation during administration of parental feeding solution
  6. Administering medication and mother's milk
    - Drug's metabolism in mother's milk
    - Medication during breast-feeding period

**Practical:**

Safe administration of medications by considering nursing responsibilities of caring for infants based on professional, ethical and legal duties, in depth knowledge regarding pharmacology and pharmacodynamics in drugs' application, preparation and patient's observation during sensitive drug administration for infants, observation of common medications, evaluation of infant's vital signs during drug administration, assessing intake and outputs and kidney function, assessing infants for drug poisoning signs, double checking of administered drugs, rational administration of drugs regarding time, rout, observation during administration, preparation, administration of parental feeding and teaching family about special medications at discharge

**Principal references:**

1. Trounce J. Clinical pharmacology for nurses. Churchill Livingstone publisher, Last Ed
2. Yaffe JF, Aranda JV. Neonatal and pediatric pharmacology: therapeutic principles in practice. Lippincott Williams and Wilkins, last Ed
3. Verklan MT, Walden M. Core curriculum for neonatal intensive care nursing. Saunders, Last Ed
4. Young T, Magnum B. Neofax. Thomson Reuters, last Ed
5. The northern neonatal network. Neonatal formulary: drug use in pregnancy and the first year of life (northern neonatal network). Wiley Blackwell. Last Ed

**Student assessment methods:**

Mid-term and final written exam (theoretical) and practical evaluation, conducting a project and reporting how they provide, prepare and administer as well as drug's observation in neonatal intensive care unit, providing administration guide and observation of sensitive neonatal medications

**Title of the course: Principles of Neonatal Nursing Care (1)**



Code of the course: 09

Number of credit: 3

Type of the course: theoretical and practical

Prerequisite:

- An introduction to neonatal intensive care nursing,
- Infant's anatomy,
- Physiology and physiopathology

Principal objective of the course:

Aim of this course is to enable students to learn about principles and concepts of pre-birth and care of infants during birth, common infant's care, and establishing appropriate relationship with the family, identifying infants at risk and understanding required awareness in related issues and problems, preparing student and providing suitable opportunities in accordance with nursing role in the care of infants and their families from birth till discharge.

Main Topics: (17 hours theoretical and 102 hours practical)

Theoretical

1. Nursing care during normal pregnancy
  - Definitions
  - Physiological changes of human body
  - Nursing care during pregnancy and before birth
  - Assessment of fetus's condition
  - Estimating pregnancy duration
  - Screening during pregnancy
  - How to make assessment during pregnancy
  - The process of pregnancy and normal delivery
  - Post-delivery care
2. Nursing care during at risk pregnancy
  - Nursing care during pregnancy and before birth
  - Assessment of fetus's health
  - The process of pregnancy at risk
  - Post-abnormal delivery care

3. Mother's diseases and problems during pregnancy
  - Diabetes mellitus
  - High blood pressure
  - Uterus infections
  - Other issues
4. Issues surrounding childbirth and delivery
  - Premature birth
  - Early placenta separation and placenta previa
  - Abnormal delivery
  - Prolapse umbilical cord
  - Childbirth injuries
  - Administration of analgesia during childbirth
5. Drug abuse during pregnancy
  - The importance of noticing drugs during pregnancy
  - How to deal with addict mother
  - Used drugs and side effects
  - Screening during pregnancy
  - Birth and how to deal with
  - Nursing care
  - Milk feeding and using materials
  - Follow up and ethical issues
6. Adapting to out-uterine life
  - Anatomy and physiology
  - Cardiovascular-respiratory-metabolic changes
  - Infant's special issues and problems in regard to adapting to outside world
  - Identifying infants at risk
7. Evaluation of healthy infant and post-delivery common care
  - Initial assessment in operating room

- Kin to kin touch and the first feeding
  - First care including vitamin K, optical prevention, vaccination, washing newborn infant
  - Parents' awareness and teaching
  - Mother and infant in a same room and continuous feeding
  - Necessary follow ups after the birth of a healthy infant
  - Principle of screening during infancy
8. Physical assessment
- Perinatal history
  - Infant's clinical assessment
  - Estimating premature or underweight fetus age inside uterus, how to use Ballard score
  - Assessment of growth indexes and categorization of infant's growth
  - Assessment of infant's normal nervous responds
9. Infant's resuscitation
- Predicting and preparing
  - Step by step resuscitation based of latest guideline
  - How to deal with infant with aspiration meconium
  - Resuscitation of premature infant
  - Resuscitation of infant in special circumstances
  - Decision making and ethical issues
  - Complications and care post-resuscitation
10. Principles of infant stabilization
- The importance of infant stabilization after resuscitation in survival of infant before transfer
  - The importance of safe care in infant stabilization
  - The importance and paying attention to stabilization of infant blood sugar, temperature, breathing support, blood circulation, laboratory assessment and family's ethical issues
11. Principles of infant's transfer
- The importance of safe transfer

- Principles of infant transfer
- Transfer process
- Infant transfer requirements
- Transfer management
- Quality control
- Transfer team
- Coordination
- Care during transfer
- Reporting and documentation of transfer

#### Practical

Students practice theoretical principles of the program in practical setting. In addition, they will be taught infant's resuscitation, stabilization, and transfer in workshop.

#### Principal references:

1. Verklan MT, Walden M. Core curriculum for neonatal intensive care nursing. Saunders, Last Ed
2. Williamson A, Crozier K. Neonatal Care: A text book for student midwives and nurses. Reflect Press Ltd, Last Ed
3. AAA. Textbook of neonatal resuscitation. American academy of pediatrics: last Ed
4. Karlen KA. The stable program. The stable program Pub, Last Ed
5. Wong DL, Wilson D, Ahmann E. Whaley and Wong's Nursing care of infants and children. Mosby-Year Book, Last Ed
6. Wong DL. Whaley and Wong's essentials of pediatric nursing. Mosby-Year Book, Last Ed

#### Student assessment methods:

Mid-term and final written exam and practical evaluation

**Title of the course: Principles of Neonatal Nursing Care (2)**

Code of the course: 10

Number of credit: 4

Type of the course: theoretical- placement

Prerequisite:

- Infant's clinical pharmacology
- Principles of neonatal nursing care (1)

Principal objective of the course:

To prepare students for providing appropriate opportunities for holistic care of infant and family with an emphasis on evolutionary approach centering family during hospitalization in neonatal intensive care unit to improve infants' health

Main Topics: (34 hours theoretical and 102 hours practical)

Theoretical

1. Regulating temperature

- The importance of thermoregulation and the risk of hypothermia in infant
- Influential physiological changes on thermoregulation
- Nurses' role in improving infants' physical and mental health
- Paying attention to common post-birth follow-ups
- Required teaching during newborn infant's discharge
- The importance of continuation of mother's breastfeeding

2. Principles of fluid therapy in infant

- Fluid exchange
- Fluid balance
- Common water and mineral disorders
- Acid and alkaline balance and common disorders

3. Sugar metabolism and blood balance

- The process of sugar exchange in infant
- Blood sugar control
- Identifying infants at the risk of hypoglycemia
- Infant of diabetic mother

- How to treat hypoglycemia
  - Hyperglycemia and its importance during infancy
  - Causes of hyperglycemia in infants
  - How to treat hyperglycemia
4. Principles of infant's feeding
- Anatomy and physiology of infant's digestive system
  - Infant's feeding needs
  - The importance of early feeding
  - Mother's breastfeeding
  - Common approaches of infant's feeding
  - Growth observation
  - Principle of parental (IV) feeding and its observation
  - Required nursing care and interventions
5. Evolutionary support
- Identifying existing barriers of normal growth process in neonatal intensive care units
  - Methods of desecrating conflicts in neonatal intensive care units to facilitate evolutionary condition for infant
  - Evolutionary assessment of infant
6. Common diagnostic and laboratory reviews
- Common laboratory reviews in neonatal intensive care units
  - Aims of laboratory assessment
  - Sampling
  - Nurses' role in infant care during sampling to reduce pain and stress and complications
  - Sampling for common screening during infancy
  - Interpretation of common laboratory reviews during infancy
7. Imaging
- Concepts
  - Imping principles during infancy

- Common radiology images in neonatal intensive care units
  - Radiography risk factors in neonatal intensive care units
  - Interpretation of common radiography images
  - Paying attention to infant's chest x-ray and common pulmonary problems including Hyaline membrane disease, air leak syndrome, cardiac condition
  - Assessing condition of catheters and entrance points
  - Ultrasound principles
  - CT scan
  - MIR imaging in infant
  - Echocardiogram
  - Other infant's imaging scenarios
  - Nurses role in care of the infant during imaging procedures and ultrasound
8. Common practical interventions in neonatal intensive care units
- Nurse's assistance in common practical interventions in neonatal intensive care units
  - Opening of airways (airway intubation, suctioning, complications)
  - IV access (place, peripheral-central, care, complications)
  - Venous catheter and umbilical artery (principles, cares, sampling, complications)
  - Common samplings ( arterial blood sampling, Venous blood sampling, Capillary)
  - Urinary catheter and nursing care principles
  - Draining CSF and nursing assistance in the care of infant and documentation
9. Pain management and assessment and reducing infant's stress
- The importance of noticing pain and stress of infants
  - Pain and stress in neonatal intensive care units
  - Stressful interventions in neonatal intensive care units
  - Changing the structure in neonatal intensive care unit to reduce stress
  - Pain in premature infant
  - Pain scale and observation
  - Infant's nursing interventions to reduce pain and stress

- Cuddling care (kangaroo)
- Medication therapy

#### 10. Family in crisis

- Principle of relationship with family
- Family-centered care
- Crisis caused by the birth of premature or critically ill baby in the family
- Crisis caused by the birth of baby with family problem
- Emotional effects of infant and family dependence after birth and influential problems on that
- Process of dependency between family and infant
- Paying attention to parents' emotional needs
- How to deal with families in neonatal intensive care units to reduce stress
- Supportive interventions for family unity
- Cultural structure consideration
- Nurses' role in improving family's mental and physical health

#### 11. Clinical observation and monitoring

- The importance of infant's observation in intensive care unit
- Common observation and monitoring equipment in neonatal intensive care unit and nursing care
- Principles of clinical observation (vital signs, nervous system condition, level of consciousness, peripheral circulation, respiratory system, pain, and stress)
- Infant's breathing observation by pulse oximetry, interpretation of arterial blood gases, bloody discharge output of respiratory machine and assessment of lung function
- Cardiovascular observation through non-invasive intervention, obtaining ECG appropriately, assisting invasive cardiovascular observation
- Non-invasive observation of nervous system and assisting in invasive observation of central nervous system

#### 12. Documentation in neonatal intensive care unit

- Obtaining perinatal and infant condition
- Family medical history and influential circumstances on family and infant's health



- Recoding medical examinations
- Collecting and recording of information regarding contact and family visit, interaction with staffs and infant
- Correction and interpretation of ventilator's data and information regarding infant's breathing condition
- Collection and record of date regarding infant's observation
- Clinical interpretation of data
- Writing information correctly in nursing report (flow sheet)

### 13. Identifying ill and unwell infant

- Identifying unwell infant
- Condition of identification and prioritizing treatment according to condition
- Completing checklist of infant's condition severity
- Correct nursing interpretation of clinical data
- Management of suitable and on time interventions regarding infant according to condition
- On time decision making with regard to care priority
- Correct and on time nursing interventions
- Alerting neonatal medical team and other issues

### 14. Premature and underweight infant

- Ethical principles and pre-birth preparations
- How to behave in operating room
- Admission process in neonatal intensive care unit
- Assessment process
- Common issues and problems of premature babies
- Paying attention to growth of premature infant and designing a care plan with evolutionary approach
- Nurses role in continuous mother's breastfeeding of premature infant and mother's cuddly care
- Common nursing care of premature infant
- Reducing premature infant's pain and stress and calming interventions

### 15. Discharging to pediatric wards

- The importance of discharge planning and continuous care
- Organizational discharge process of infant from intensive care unit
- The process of transferring infant to home
- Teaching subjects to family
- Documentation and discharge process checklist
- Paying attention to infant's growth in discharge plan
- Follow-ups after discharge

#### Practical

Students practice theoretical principles of the program in practical setting

#### Principal references:

1. Verklan MT, Walden M. Core curriculum for neonatal intensive care nursing. Saunders, Last Ed
2. Ludington-Hoe SM, Golant S. Kangaroo care: The best you can do to help your premature infant. Bantam, Last Ed
3. La Leache League International. Breastfeeding your premature baby. La Leache League International. Last Ed
4. MacDonald MG, Ramasethu J. Atlas of procedures in neonatology. Lippincott Williams and Wilkins, Last Ed
5. The latest national guideline for mother's breastfeeding, committee for promoting breast feeding- ministry of health and medical education

#### Student assessment methods:

Mid-term and final written exam (theoretical) and practical evaluation

**Title of the course: Principles of Advance Neonatal Nursing Care (1)**

Code of the course: 11

Number of credit: 4

Type of the course: theoretical- practical

Prerequisite:

Principles of neonatal nursing care (2)

Principal objective of the course:

To prepare students and provide appropriate opportunity with accordance to the role of nurses in holistic care of infants and families from admission to discharge in neonatal intensive care unit

Main Topics: (34 hours theoretical - 102 hours practical)

Theoretical

1. Nursing care of infant with breathing difficulty

- Evolution of respiratory system
- Physiology review of respiratory system
- Respiratory distress syndrome
  - How to treat
  - Signs
  - How to assess and observe
  - Common care and interventions
  - Complications
  - Prevention
- Pneumonia
  - Common cases
  - Signs
  - How to assess
  - Nursing care
- Aspiration Pneumonia
  - Aspiration meconium
    - Signs

- How to assess
  - Common interventions
  - How care for
- Other aspiration cases
- Other respiratory diseases
  - Chronic respiratory disease
    - Signs
    - How to prevent
    - Nursing care
    - Complications
  - Air leak syndrome
    - Signs
    - How to assess
    - How to prevent
    - Nursing care
  - Pulmonary bleeding
    - Signs
    - Causes and how to assess
    - Nursing care
  - Thoracic diseases that require surgery
    - Type
    - Signs
    - Preparation and giving information to family
    - Pre and post-surgery nursing care
  - Pulmonary Hypoplasia
    - Nursing care
- Breathing pause (apnea)
  - Types
  - How apnea occur in premature infant

- Causes of apnea
  - How to assess infant with apnea
  - Common interventions in infant with apnea
  - Observation of infant with apnea
2. Mechanical ventilation
- Principles of assisted ventilation
  - Common types of assisted ventilation
  - Oxygen therapy
    - Principles and types of oxygen therapy
    - How to care for
    - Observation of oxygen administration
    - Side effects of oxygen administration
    - How to care for infant during oxygen therapy
  - Assessment of infant under assisted ventilation
    - Interpretation of blood gases
    - Clinical observation
    - Radiological examination
    - Nursing care of infant under assisted ventilation
    - Collecting and interpreting data of mechanical ventilator
  - Common methods of assisted ventilation
    - Types of common methods
    - Noninvasive methods of assisted ventilation including positive constant pressure (CPAP) and (NIPPV)
    - Ventilation by acylation approach HFO
  - Common ventilation machine during infancy
    - Constant observation of data from mechanical ventilation machine
    - Nursing care of infant under mechanical ventilation
  - Medications used in ventilation machine
    - Types of surfactants

- Principle of surfactant administration
- Nursing care prior and during surfactant administration
- Inhales
- Administration of inhaler gases
- Types of weaning off infant from mechanical ventilation machine
  - Preparing infant to wean off from mechanical ventilation machine
  - Observing infant after being weaned off from mechanical ventilation machine
  - Interpretation of blood gases

### 3. Nursing care of infant with cardiovascular disease

- Review of cardiovascular system during fetal period
- Types of cardiac disorders
- How to respond to infant with cardiac disease
- Heart failure
- Preparation of infant for hearth surgery
- Nursing care of infant after heart surgery
- Nursing care of family of infant with cardiac disease
- Infant normal heart rhythm and cardiac arrhythmias during infancy and how to respond
- Nursing care of infant with problems associated with immune system and infectious diseases
- Review of infant immune system and how to connect with mother
- Pathogens and common infections during infancy
- How infection transfer to infant
- How to respond to infant with infectious diseases
- Types of common infections during infancy
- Infection prevention during infancy
- Infection control in intensive care unit

#### Practical

Students practice theoretical principles of the program in practical setting

Principal references:

1. Verklan MT, Walden M. Core curriculum for neonatal intensive care nursing. Saunders, Last Ed
2. Goldsmith JP, Karotkin E. assisted ventilation of the neonate. Saunders, Last Ed.

Student assessment methods:

Mid-term and final written exam (theoretical) and practical evaluation

**Title of the course: Principles of Advance Neonatal Nursing Care (2)**

Code of the course: 12

Number of credit: 4

Type of the course: theoretical - practical

Prerequisite:

Principles of neonatal nursing care (2)

Principal objective of the course:

To prepare students and provide appropriate opportunity with accordance to the role of nurses in holistic care of infants and families during hospitalization to improve infant's care

Main Topics: (34 hours theoretical - 102 hours practical)

Theoretical

1. Nursing care of infants with digestive system disorders
  - Review of digestive system during fetal period and infancy
  - Assessment of digestive system
  - Blockage of digestive system
  - Abdominal wall defects
  - Cholestasis and biliary atresia
  - Stomach reflex to esophagus
  - Multi organ disorders with digestive system problems
  - Intestine disorders
  - Nursing care of infants who require abdominal surgery
  - Increase of bilirubin
  - How to respond to hyperbilirubinemia
  - Assessment and interventions in yellow infant
  - Nursing care of yellow infant
  - Hydrops
2. Nursing care of infants with endocrine diseases and metabolic
  - Endocrine system
  - Thyroid gland's diseases



- Signs
    - Assessment
    - Nursing care
  - Adrenal gland's diseases
    - Signs
    - Assessment
    - Nursing care
  - Sexual system evolutionary disorders
    - Signs
    - Assessment
    - Nursing care
  - Common metabolic diseases
    - Types of common diseases
    - Signs
    - Assessment and how to respond
    - Nursing care
3. Nursing care of infants with urinary and sexual organ diseases
- Evolution of urinary tract
  - Physiology of kidney and urinary tract
  - Kidney failure
  - Assessment of infant blood pressure during infancy
  - Common congenital kidney disorders
  - Hydronephrosis
  - Urinary infections
  - Renal vein thrombosis
  - Renal and urinary tract diseases that require surgery
  - Urethra and sexual organ disorders of infant
  - Nursing care of infants after circumcision
4. Nursing care of infants with blood diseases

- Evolution process of blood cells and blood coagulation system
- Interpretation of peripheral blood samples
- Anemia
- Coagulation disorders of infant
- Hemorrhagic disease of infant
- Thrombocytopenia
- Polycythemia
- Hereditary hemorrhagic diseases
- Disseminated intravascular coagulation
- Blood administration and blood products
- Administration of biological agents
- Nursing care of infants with blood diseases, nursing care in administration of blood products and biological agents during infancy

5. Nursing care infant with neuromuscular diseases

- Review of nervous system anatomy and physiology
- Neurological assessment during infancy
- Common neurological diseases
- Hypoxic ischemic encephalopathy
- Seizure
- Intracerebral hemorrhage
- Periventricular leukomalacia
- Meningitis and infections of nervous system
- Hypotonic infant
- Neurological diseases that require surgery
- Nursing care of infants with neuromuscular diseases

6. Nursing care of infants with congenital abnormalities and genetic problems

- Types of common disorders
- How to deal with parents of infant with abnormality
- Emotional support of parents

- Nursing care of family and infant with abnormalities and genetic problems
7. Nursing care of infant's skin
    - The importance of skin for infant
    - Skin in premature infants
    - Skin assessment of infant
    - How to care for infant's skin
    - Maintenance and protection of skin health of infant
    - Common nursing care and prevention of skin injuries
    - Common skin conditions
  8. Nursing care of infants with hearing and sight problems
    - Infant's assessment
    - Common problems and how to respond to them
    - Examination of infant for Retinopathy of prematurity
    - Principles of nursing care of unwell infant's eye, hearing assessment of infant after discharge
    - Nursing care to prevent optical harm and hearing problems
  9. Nursing care of infants who require surgery
    - Common surgeries during infancy
    - Pre and post-surgery nursing care of infants
    - Preparing infant for surgery
    - Pre and post-surgery assessment
    - Principles of infant's transfer for surgery
    - Nursing care of infant's family
    - Nursing care of infants in different surgeries

### **Practical**

Students practice theoretical principles of the program in practical setting.

Principal references:

1. Verklan MT, Walden M. Core curriculum for neonatal intensive care nursing. Saunders, Last Ed

**Student assessment methods:**

**Mid-term and final written exam (theoretical) and practical evaluation**