

CHEMISTRY (CHEM)

A grade of C or better is required for prerequisite courses.

CHEM 101 Chemistry and Society (GT-SC2) 3(3-0)

Spring.
Chemistry related to the everyday world. Drugs, food, pollution, pesticides, consumer products, energy, and home health. Principally for non-science majors.
Prerequisite: None.
Corequisite: None.
Registration Information: None.
(Gen Ed: ST, GT-SC2)

CHEM 101L Chemistry and Society Lab (GT-SC1) 1(0-2)

Spring.
Laboratory is optional. Experiments to exemplify the logical steps of problem solving and explore the physical and chemical world.
Prerequisite: None.
Corequisite: None.
Registration Information: CHEM 101 strongly recommended. as corequisite.
(Gen Ed: ST, GT-SC1)

CHEM 111 Principles of Chemistry (GT-SC2) 3(3-0)

Fall, Spring.
Fundamental laws, theories and principles of chemical reactions. Credit not applicable for chemistry majors or minors.
Prerequisite: MATH 101.
Corequisite: None.
Registration Information: Equivalent math placement score.
(Gen Ed: ST, GT-SC2)

CHEM 111L Principles of Chemistry Lab (GT-SC1) 1(0-2)

Fall, Spring.
Experiments using common chemical equipment and techniques to aid the student in learning what occurs in the chemical laboratory.
Prerequisite: CHEM 111.
Corequisite: None.
Registration Information: None.
(Gen Ed: ST, GT-SC1)

CHEM 121 General Chemistry I (GT-SC2) 4(4-0)

Fall, Spring.
For science, engineering and pre-professional curricula. Atomic theory, chemical bonding, periodic properties, states of matter, reactions, oxidation-reduction, stoichiometry, thermochemistry, inorganic nomenclature.
Prerequisite: CHEM 111 and MATH 120.
Corequisite: None.
Registration Information: One year of high school chemistry strongly recommended. Satisfactory placement score on California Chemistry Diagnostic test may be accepted in place of CHEM 111. Equivalent Accuplacer score may be accepted in place of MATH 120.
(Gen Ed: ST, GT-SC2)

CHEM 121L General Chemistry Lab I (GT-SC1) 1(0-2)

Fall, Spring.
General Chemistry Lab I.
Prerequisite: None.
Corequisite: None.
Registration Information: CHEM 121 is strongly recommended as corequisite.
(Gen Ed: ST, GT-SC1)

CHEM 122 General Chemistry II (GT-SC2) 4(4-0)

Fall, Spring.
Continuation of CHEM 121. Thermodynamics, kinetics, equilibria, nuclear chemistry, electrochemistry, acids and bases, solutions, descriptive inorganic chemistry.
Prerequisite: CHEM 121.
Corequisite: None.
Registration Information: None.
(Gen Ed: ST, GT-SC2)

CHEM 122L General Chemistry Lab II (GT-SC1) 1(0-2)

Fall, Spring.
Laboratory component to CHEM 122.
Prerequisite: CHEM 121L.
Corequisite: None.
Registration Information: CHEM 122 is strongly recommended as corequisite.
(Gen Ed: ST, GT-SC1)

CHEM 125 Environmental Science (GT-SC2) 3(3-0)

Fall.
An overview of terrestrial and aquatic environments, the atmosphere, energy, climate change, and natural resources. Emphasis is placed on sustainability needs and challenges.
Prerequisite: None.
Corequisite: None.
Registration Information: None.
(Gen Ed: ST, GT-SC2)

CHEM 125L Environmental Science Laboratory (GT-SC1) 1(0-2)

Fall.
Laboratory course to accompany CHEM 125.
Prerequisite: None.
Corequisite: None.
Registration Information: CHEM 125 is strongly recommended as corequisite.
(Gen Ed: ST, GT-SC1)

CHEM 150 (PHYS 150) Elementary Concepts in Phys & Chem 4(3-2)

Spring.
Hands-on standards-based approach to understanding basic concepts of physics and chemistry. Integrated lecture, lab and discussion periods.
Prerequisite: None.
Corequisite: None.
Registration Information: Acceptance into Teacher Education Program.

CHEM 160 Introduction to Forensic Science (GT-SC2) 3(3-0)

Spring.
Overview of Forensic Science. Crime scene investigation. Evidence collection. Microscopy techniques. Arson analysis. Fingerprints. Serology and DNA use.
Prerequisite: None.
Corequisite: None.
Registration Information: None.
(Gen Ed: ST, GT-SC2)

CHEM 160L Intro to Forensic Science Lab (GT-SC1) 1(0-2)

Spring.

Overview of Forensic Science Laboratory. Evidence handling and collection. Microscopy techniques. Arson analysis, Fingerprints. DNA fingerprinting.

Prerequisite: None.

Corequisite: None.

Registration Information: CHEM 160 strongly recommended as corequisite.

(Gen Ed: ST, GT-SC1)

CHEM 170 Academic Orientation 0.5(0.5-0)

Fall.

Chemistry majors entering the program are introduced to principles of academic communication and professionalism relevant to freshman year. Chemistry careers, study skills, and academic advisement are also included.

Prerequisite: None.

Corequisite: None.

Registration Information: None.

CHEM 211 Introduction to Organic Chemistry 3(3-0)

Fall.

Survey of organic chemistry chemical structure, reactivity and functional groups are presented in context of relevance to society.

Prerequisite: CHEM 111.

Corequisite: None.

Registration Information: None.

CHEM 211L Intro to Organic Chemistry Lab 1(0-3)

Fall.

Survey of organic chemistry laboratory course. Basic organic laboratory techniques and skills, both micro and macro scale are presented.

Prerequisite: None.

Corequisite: None.

Registration Information: CHEM 211 strongly recommended as corequisite.

CHEM 260 Forensic Chemistry I 3(3-0)

As Needed.

Investigation of comparative/visual forensic analysis techniques. Topics include fingerprinting, bloodstain pattern analysis, fiber comparisons, and firearms analysis.

Prerequisite: CHEM 111 or CHEM 121 and CHEM 160.

Corequisite: None.

Registration Information: None.

CHEM 260L Forensic Chemistry I Laboratory 1(0-3)

As Needed.

Development of laboratory skills for comparative/visual forensic analysis. Topics include fingerprinting, bloodstain pattern analysis, fiber comparisons, and firearms analysis. A more in-depth examination of CHEM 160L topics.

Prerequisite: CHEM 111 or CHEM 121 and CHEM 160 and CHEM 160L.

Corequisite: None.

Registration Information: CHEM 260 is strongly recommended as corequisite.

CHEM 291 Special Topics (1-5 V)

As Needed.

Special Topics.

Prerequisite: None.

Corequisite: None.

Registration Information: Permission of instructor. Repeatable (99).

CHEM 292 Research 1-3(1-3-1-3)

Fall, Spring, Summer.

Faculty directed research project for undergraduate first or second-year student.

Prerequisite: None.

Corequisite: None.

Registration Information: Permission of instructor. Repeatable (3).

CHEM 301 Organic Chemistry I 3(3-0)

Fall, Spring.

For majors and pre-professional students requiring a strong background in organic chemistry. Organic reactions and mechanisms as related to molecular structure.

Prerequisite: CHEM 122.

Corequisite: None.

Registration Information: None.

CHEM 301L Organic Chemistry Lab I 2(0-6)

Fall, Spring.

Organic Chemistry Lab I.

Prerequisite: CHEM 122L.

Corequisite: None.

Registration Information: CHEM 301 strongly recommended as corequisite.

CHEM 302 Organic Chemistry II 3(3-0)

Fall, Spring.

Continuation of CHEM 301.

Prerequisite: CHEM 301.

Corequisite: None.

Registration Information: None.

CHEM 302L Organic Chemistry Lab II 2(0-6)

Fall, Spring.

Organic Chemistry Lab II.

Prerequisite: CHEM 301L.

Corequisite: None.

Registration Information: CHEM 302 strongly recommended as corequisite.

CHEM 311 Biochemistry Survey 3(3-0)

Fall.

Survey of biochemistry. For pre-health professional students.

Intermediary metabolism is taught at an intermediate level and in the context of human nutrition and clinical applications.

Prerequisite: CHEM 301.

Corequisite: None.

Registration Information: CHEM 302 strongly recommended as prerequisite.

CHEM 317 Quantitative Analysis 3(3-0)

Fall.

Volumetric and gravimetric analysis integrated with instrumental analysis, both optical and electrometric methods.

Prerequisite: CHEM 122.

Corequisite: None.

Registration Information: None.

CHEM 317L Quantitative Analysis Lab 2(0-6)

Fall.

Quantitative Analysis Lab.

Prerequisite: CHEM 317.

Corequisite: None.

Registration Information: CHEM 317 strongly recommended as corequisite.

CHEM 321 Physical Chemistry I 3(3-0)

Spring.
Chemical thermodynamics, chemical dynamics (kinetics), chemical structure and statistical mechanics.
Prerequisite: CHEM 322.
Corequisite: None.
Registration Information: None.

CHEM 322 Physical Chemistry II 3(3-0)

Fall.
Quantum mechanics, spectroscopy, chemical structure, and statistical mechanics.
Prerequisite: CHEM 122 and MATH 126.
Corequisite: None.
Registration Information: MATH 224 and PHYS 201 or PHYS 221 strongly recommended as corequisite.

CHEM 323 Experimental Physical Chemistry 2(0-4)

Spring.
Laboratory techniques in thermodynamics, chemical equilibria, phase phenomena, kinetics, and spectroscopy.
Prerequisite: CHEM 322.
Corequisite: None.
Registration Information: CHEM 321 is strongly recommended as prerequisite. Permission of instructor.

CHEM 370 Academic Enrichment 0.5(0.5-0)

Spring.
Chemistry majors in the third year of the program and above review principles of academic communication, professionalism, as well as academic progress and skills in relation to industrial/academic career preparation.
Prerequisite: CHEM 170.
Corequisite: None.
Registration Information: Permission of department chair.

CHEM 378 Practicum in Laboratory Instruction 1(0-2)

Fall, Spring.
Laboratory preparation, instruction, safety, and methods under the guidance of an instructor.
Prerequisite: None.
Corequisite: None.
Registration Information: Permission of instructor. Repeatable (2).

CHEM 389 Scientific Literature Review 1(1-0)

As Needed.
Surveys of both print and web-based chemical and biochemical literature.
Prerequisite: CHEM 302.
Corequisite: None.
Registration Information: Repeatable (2).

CHEM 401 Advanced Organic Chemistry 3(3-0)

Fall, Even.
Topics of advanced organic chemistry, including organic reactions, mechanisms, natural products, and spectroscopy.
Prerequisite: CHEM 302.
Corequisite: None.
Registration Information: Permission of instructor.

CHEM 401L Advanced Organic Chemistry Lab 2(0-4)

Fall, Even.
Laboratory course to accompany CHEM 401. Molecular structure determination by chemical and instrumental methods.
Prerequisite: CHEM 302 and CHEM 302L.
Corequisite: CHEM 401.
Registration Information: Permission of instructor.

CHEM 402 Spectroscopy 3(3-0)

Spring, Even.
An advanced study of topics of spectroscopy focusing on the structure determination of compounds. Emphasis on IR, NMR, MS, and UV-VIS spectroscopies.
Prerequisite: CHEM 302.
Corequisite: None.
Registration Information: None.

CHEM 403 Polymer Chemistry 3(3-0)

As Needed.
Study of synthetic polymers including synthesis, mechanisms of formation, structure of elucidation, reactivity, properties, and industrial application. Biopolymers also will be considered.
Prerequisite: CHEM 302 and CHEM 302L.
Corequisite: None.
Registration Information: None.

CHEM 411 Biochemistry I 3(3-0)

Fall.
Chemistry of constituents of living matter, including proteins, carbohydrates, nucleic acids and lipids. An introduction to enzymes and coenzymes.
Prerequisite: CHEM 302.
Corequisite: None.
Registration Information: Permission of instructor.

CHEM 412 Biochemistry II 3(3-0)

Spring.
Continuation of CHEM 411. Intermediary metabolism of carbohydrates, lipids, and amino acids. Bioenergetics.
Prerequisite: CHEM 411 or CHEM 511.
Corequisite: None.
Registration Information: Permission of instructor.

CHEM 412L Biochemistry II Lab 2(0-6)

As Needed.
Biochemistry II Lab.
Prerequisite: CHEM 302.
Corequisite: None.
Registration Information: CHEM 412 strongly recommended as corequisite.

CHEM 413 Molecular Basis of Disease 3(3-0)

As Needed.
This advanced seminar course explores the molecular nature of disease and engages students in the study of diseases using current topical biochemical literature.
Prerequisite: CHEM 411 or CHEM 511.
Corequisite: None.
Registration Information: Permission of instructor.

CHEM 419 Instrumental Analysis 3(3-0)

Spring.
Instrumental techniques in chemical separations, electrochemistry, atomic, and molecular spectroscopy.
Prerequisite: CHEM 317 and CHEM 322.
Corequisite: None.
Registration Information: Permission of instructor.

CHEM 419L Instrumental Analysis Lab 2(0-6)

Spring.

Instrumental Analysis Lab.

Prerequisite: CHEM 317 and CHEM 322.

Corequisite: None.

Registration Information: CHEM 419 strongly recommended as corequisite. Permission of instructor.

CHEM 420 Inorganic Chemistry (3 V)

Fall.

A foundations in inorganic chemistry survey course, which includes atomic and molecular structure, symmetry, simple solids, acid-base theory, oxidation-reduction reactions, coordination chemistry, and physical methods.

Prerequisite: CHEM 122.

Corequisite: CHEM 420L.

Registration Information: None.

CHEM 420L Inorganic Chemistry Lab 1(0-3)

Fall.

Inorganic laboratory techniques, inorganic qualitative analysis, synthesis and characterization.

Prerequisite: None.

Corequisite: CHEM 420.

Registration Information: None.

CHEM 421 Advanced Inorganic Chemistry (3 V)

Spring.

Detailed examination of inorganic chemistry with emphasis on symmetry and group theory, chemical bonding and structure, electronic spectroscopy, and reactivity.

Prerequisite: CHEM 322 and CHEM 420.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 425 Environmental Chemistry 3(3-0)

As Needed.

Chemical process in air, water and soil. Air, water analysis and treatment, pollution.

Prerequisite: CHEM 321.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 425L Environmental Chemistry Lab 2(0-4)

As Needed.

Laboratory course to accompany CHEM 425. Explores sampling and laboratory techniques utilized in the analysis of environmental samples or to address environmental issues.

Prerequisite: None.

Corequisite: None.

Registration Information: CHEM 425 strongly recommended as corequisite.

CHEM 431 Advanced Physical Chemistry 3(3-0)

Fall, Odd.

Emphasizes latest developments in applied physical chemistry, including advanced theory, and instrumental and computational applications.

Prerequisite: CHEM 321 and CHEM 322.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 460 Forensic Chemistry II 2(2-0)

As Needed.

Investigation of identification techniques for forensic analysis. Topics include arson, biological fluid and drug identification, and DNA analysis.

Prerequisite: CHEM 260 and CHEM 260L and CHEM 302 and CHEM 302L.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 460L Forensic Chemistry II Lab 2(0-4)

As Needed.

The laboratory will accompany CHEM 460, Forensic Chemistry II lecture.

Prerequisite: CHEM 260 and CHEM 260L and CHEM 302 and CHEM 302L.

Corequisite: None.

Registration Information: CHEM 460 is strongly recommended as corequisite. Permission of instructor.

CHEM 491 Special Topics (1-5 V)

As Needed.

Special Topics.

Prerequisite: None.

Corequisite: None.

Registration Information: Permission of instructor. Repeatable (99).

CHEM 492 Research (1-3 V)

Fall, Spring, Summer.

Faculty directed research project for undergraduate student.

Prerequisite: None.

Corequisite: None.

Registration Information: Permission of instructor. Repeatable (4).

CHEM 493 Seminar 1(1-0)

Fall.

Presentation of a formal presentation on chemical research or a current topic in the chemical literature using software-based delivery methods.

Prerequisite: CHEM 370.

Corequisite: None.

Registration Information: Repeatable (2).

CHEM 495 Independent Study (1-7 V)

As Needed.

Independent Study.

Prerequisite: None.

Corequisite: None.

Registration Information: Permission of instructor. Repeatable (99).

CHEM 498 Internship (1-6 V)

Fall, Spring, Summer.

Work experience in the chemistry discipline under the combined supervision of the selected organization and a faculty member.

Prerequisite: None.

Corequisite: None.

Registration Information: Permission of instructor. Repeatable (99).

CHEM 501 Advanced Organic Chemistry 3(3-0)

Fall, Even.

Topics of advanced organic chemistry including organic reactions, mechanisms, natural products, spectroscopy, and industrial applications.

Prerequisite: CHEM 302.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 501L Advanced Organic Chemistry Lab 2(0-4)

Fall, Even.

Molecular structure determination by chemical and instrumental methods. Advanced synthetic techniques.

Prerequisite: CHEM 302 and CHEM 302L.

Corequisite: CHEM 501.

Registration Information: Permission of instructor.

CHEM 502 Spectroscopy 3(3-0)

Spring, Even.

An advanced study of topics of spectroscopy focusing on the structure determination of compounds. Emphasis on IR, NMR, MS, and UV-VIS spectroscopies.

Prerequisite: CHEM 302.

Corequisite: None.

Registration Information: None.

CHEM 503 Polymer Chemistry 3(3-0)

As Needed.

Study of synthetic polymers including synthesis, mechanisms of formation, structure elucidation, reactivity, properties, and industrial application. Biopolymers also will be considered.

Prerequisite: CHEM 302.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 510 (CHEM 593) Foundations in Graduate Studies 3(3-0)

As Needed.

An interdisciplinary seminar on topics appropriate to the application of natural sciences.

Prerequisite: None.

Corequisite: None.

Registration Information: Graduate standing.

CHEM 511 Biochemistry I 3(3-0)

Fall.

Chemistry of constituents of living matter, including proteins, carbohydrates, nucleic acid and lipids. An introduction to enzymes and coenzymes.

Prerequisite: CHEM 302.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 512 Biochemistry II 3(3-0)

Spring.

Intermediary metabolism of carbohydrates, lipids and amino acids. Bioenergetics.

Prerequisite: CHEM 411 or CHEM 511.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 512L Biochemistry II Lab 2(0-6)

As Needed.

Biochemistry II Lab.

Prerequisite: CHEM 302.

Corequisite: None.

Registration Information: CHEM 512 strongly recommended as corequisite.

CHEM 513 Molecular Basis of Disease 3(3-0)

As Needed.

This advanced seminar course explores the molecular nature of disease and engages students in the study of diseases using current topical biochemical literature.

Prerequisite: CHEM 411 or CHEM 511.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 519 Instrumental Analysis 3(3-0)

Spring.

Instrumental techniques in chemical separations, electro-chemistry, atomic, and molecular spectroscopy.

Prerequisite: CHEM 317 and CHEM 322.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 519L Instrumental Analysis Lab 2(0-6)

Spring.

Instrumental Analysis Lab.

Prerequisite: CHEM 317 and CHEM 322.

Corequisite: None.

Registration Information: CHEM 519 strongly recommended as corequisite. Permission of instructor.

CHEM 521 Advanced Inorganic Chemistry 3(3-0)

Spring.

Structure and bonding, coordination theory, periodic relations, equilibrium, kinetics, thermodynamics, descriptive chemistry, industrial applications.

Prerequisite: CHEM 322 and CHEM 420.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 525 Environmental Chemistry 3(3-0)

As Needed.

Chemical processes in the air, water and soil. Air, water soil analysis and treatment. Special emphasis upon the problems and effects of industrial and other pollution.

Prerequisite: CHEM 321.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 525L Environmental Chemistry Lab 2(0-4)

As Needed.

Laboratory course to accompany CHEM 525. Explores sampling and laboratory techniques utilized in the analysis of environmental samples or to address environmental issues.

Prerequisite: None.

Corequisite: None.

Registration Information: CHEM 525 strongly recommended as corequisite.

CHEM 529 Advanced Analytical Chemistry 3(3-0)

Spring, Even.

Emphasizes latest developments in applied analytical chemistry, including advanced theory, wet chemical methods, and the design and application of advanced instrumentation.

Prerequisite: CHEM 321 and CHEM 419 and CHEM 419L or CHEM 519 and CHEM 519L.

Corequisite: None.

Registration Information: None.

CHEM 531 Advanced Physical Chemistry 3(3-0)

Fall, Odd.

Emphasizes latest developments in applied physical chemistry, including advanced theory, and instrumental and computational applications.

Prerequisite: CHEM 321 and CHEM 322.

Corequisite: None.

Registration Information: Permission of instructor.

CHEM 550 Industrial Chemistry 2(2-0)

As Needed.

Economic importance & special characteristics of chemical industry. Feedstocks, intermediates, & products. Case studies illustrating various topics.

Prerequisite: None.

Corequisite: None.

Registration Information: None.

CHEM 560 Forensic Chemistry II 2(2-0)

As Needed.

Investigation of identification techniques for forensic analysis. Topics include arson, biological fluid and drug identification, and DNA analysis.

Prerequisite: CHEM 260 and CHEM 260L and CHEM 302 and CHEM 302L.

Corequisite: CHEM 560L.

Registration Information: Permission of instructor.

CHEM 560L Forensic Chemistry II Laboratory 2(0-4)

As Needed.

The laboratory will accompany CHEM 560, Forensic Chemistry II lecture.

Prerequisite: CHEM 260 and CHEM 260L and CHEM 302 and CHEM 302L.

Corequisite: None.

Registration Information: CHEM 560 strongly recommended as corequisite. Permission of instructor.

CHEM 578 Practicum in Laboratory Instruction 1(0-2)

Fall, Spring.

Laboratory preparation, instruction and methods under the guidance and supervision of an instructor.

Prerequisite: None.

Corequisite: None.

Registration Information: Graduate standing. Permission of instructor. Repeatable (4).

CHEM 580 Graduate Writing in the Sciences 1(1-0)

As Needed.

This one-credit course is designed to help prepare students for the rigors of academic writing at the graduate and professional levels.

Prerequisite: None.

Corequisite: None.

Registration Information: None.

CHEM 588 Internship Defense 1(1-0)

Fall, Spring, Summer.

Graduate internship presentation, satisfactory report, and examination for completion of MS degree option within the Graduate Programs in Natural Sciences.

Prerequisite: None.

Corequisite: None.

Registration Information: Graduate standing. Permission of instructor.

CHEM 589 Thesis Defense 1(1-0)

Fall, Spring, Summer.

Thesis presentation and satisfactory written thesis for completion of MS degree option within the Graduate Programs in Natural Sciences.

Prerequisite: None.

Corequisite: None.

Registration Information: Graduate standing. Permission of instructor.

CHEM 591 Special Topics (1-4 V)

As Needed.

Special Topics.

Prerequisite: None.

Corequisite: None.

Registration Information: Permission of instructor. Repeatable (99).

CHEM 592 Research (1-6 V)

Fall, Spring, Summer.

Faculty directed research project for graduate students.

Prerequisite: None.

Corequisite: None.

Registration Information: Graduate standing. Permission of instructor. Repeatable (99).

CHEM 593 (BIOL 593, CBC 593) Seminar 1(1-0)

As Needed.

An interdisciplinary seminar on topics appropriate to the application of natural sciences.

Prerequisite: BIOL 510 or CBC 510 or CHEM 510.

Corequisite: None.

Registration Information: Admission to MS program.

CHEM 595 Independent Study (1-4 V)

As Needed.

Independent Study.

Prerequisite: None.

Corequisite: None.

Registration Information: Permission of instructor. Repeatable (99).

CHEM 598 Internship (1-4 V)

Fall, Spring, Summer.

Volunteer or paid work experience under the combined supervision of the selected organization and a faculty member.

Prerequisite: None.

Corequisite: None.

Registration Information: Graduate standing. Permission of instructor. Repeatable (99).

CHEM 599 Thesis Research (1-6 V)

As Needed.

Thesis Research.

Prerequisite: None.

Corequisite: None.

Registration Information: Permission of instructor. Repeatable (99).