In an effort to standardize the hexapod classification systems being taught to our students by our faculty in multiple courses across three UGA campuses, I recommend that the Entomology Department adopts the basic system presented in the following textbook:


This book was chosen for a variety of reasons. It is widely used in the U.S. as the textbook for Insect Taxonomy classes, including our class at UGA. It focuses on North American taxa. The authors were cautious, presenting changes only after they have been widely accepted by the taxonomic community.

Below is an annotated summary of the T&J (2005) classification. Some of the more familiar taxa above the ordinal level are given in caps. Some of the more important and familiar suborders and families are indented and listed beneath each order. Note that this is neither an exhaustive nor representative list of suborders and families. It was provided simply to clarify which taxa are impacted by some of more important classification changes. Please consult T&J (2005) for information about taxa that are not listed below.

Unfortunately, T&J (2005) is now outdated with respect to some significant, recent classification changes. Therefore, in the classification standard provided below, some well corroborated and broadly accepted updates have been made to their classification scheme.

Feel free to contact me if you have any questions about this classification. If you see an important omission that should be added, please let me know.

Thank you.

Sincerely,

Joseph V. McHugh
ANNOTATED CLASSIFICATION OF HEXAPODA
(submitted by Joe McHugh, 7/2016)

ENTOGNATHA
Protura

Collembola

Diplura
   Campodeidae
   Japygidae

INSECTA (=ECTOGNATHA)
Note: Historically, the term INSECTA has been used to refer to more or less inclusive groupings of hexapods. It is occasionally used as a synonym for PTERYGOTA only. It is often used synonymously with HEXAPODA. The most widespread use of the term today, however, is as a synonym of ECTOGNATHA. As such, it would include all of the hexapods that have an ectognathous cranium.

Microcoryphia
   Machilidae

Thysanura
   Lepismatidae

PTERYGOTA
Note: While PTERYGOTA is considered to be a natural group by most systematists, APTERYGOTA is not. As such APTERYGOTA is no longer recognized in formal classifications.

Ephemeroptera

Odonata
   Suborder: Anisoptera
      Aeshnidae
      Corduliidae
      Gomphidae
      Libellulidae
      Macromiidae

   Suborder: Zygoptera
      Calopterygidae
      Coenagrionidae
      Lestidae

NEOPTERA
Note: The jury is still out on whether the higher-level group PALEOPTERA (Odonata + Ephemeroptera) is monophyletic and worthy of formal recognition in classification. The higher-level group NEOPTERA, which includes all of the taxa listed below, is broadly accepted as monophyletic and is recognized formally.

Plecoptera

Phasmida
   Pseudophasmatidae
   Heteronemiidae

Mantophasmatodea
Note: This is the recently discovered order of insects from west Africa that was first reported in 2002. They are commonly referred to as “gladiator insects”.

Grylloblattodea (=Grylloblattaria)
   Grylloblattidae

Notes:
1) In the past, DICOTYOPTERA (Mantodea + Blattodea + Isoptera) was recognized as an order of insects. Today, it is still thought to be a natural (i.e., monophyletic) group, but it is recognized in classifications at the rank of superorder now.

2) Blattodea classification is undergoing dramatic revision currently. Cryptocercidae was removed from Polyphagidae and is now recognized as a separate family. For decades there was growing phylogenetic evidence from multiple sources that termites (Isoptera) arose from the middle of the roach clade (Blattodea). Today, termites are widely recognized as highly modified, social roaches and are classified as part of Blattodea. The exact rank for the termite group is still unsettled, but they are often recognized at or near the level of superfamily. Until the familial ranks of the roach clade stabilize more, I recommend that we recognize the Isoptera as the superfamily Termitoidea (of Blattodea).
Mantodea
  Mantidae
  Mantoididae

Blattodea
  Blattidae
  Blattellidae
  Cryptocercidae
  Rhinotermitidae
  Kalotermitidae

Dermaptera
  Carcinophoridae
  Forficulidae
  Labiduridae

Embiiidina (=Embioptera)

Orthoptera
  Suborder: Caelifera
    Acrididae
    Romaleidae
    Tettigidae
    Tridactylidae
  Suborder: Ensifera
    Gryllacrididae
    Gryllidae
    Gryllotalpidae
    Mogoplistidae
    Tettigoniidae

Note: Historically many of the lower neopteran orders (Mantodea, Blattaria, Isoptera, Dermaptera, Phasmida, etc.) were considered to be families of a much more inclusive order Orthoptera. Today the order is restricted to the taxa in the suborders Caelifera and Ensifera (i.e., grasshoppers, crickets, katydids, etc.).

Zoraptera
  Zorotypidae

Psocoptera

Phthiraptera
  Pediculidae
  Pthiridae

Notes:
1) The lice were traditionally divided into two orders Mallophaga and Anoplura. Phylogenetic studies show that Mallophaga is paraphyletic if Anoplura is not included in it. As a result, both chewing and sucking lice now are recognized as one order, Phthiraptera, with four suborders: Ischnocera (part of Mallophaga), Amblycera (part of Mallophaga), Rhyncophtherina (part of Mallophaga), and Anoplura.

2) To complicate matters, it is now clear that all of Phthiraptera falls within the Pscooptera clade. There are several ways that this phylogenetic information could be accurately reflected in the classification, but until there is some consensus, I recommend that we continue to recognize both current orders. At some point these taxa will be recognized as two redefined orders, one combined order, or three separate orders.

Thysanoptera

Hemiptera
  Suborder: Auchenorrhyncha
    Acanaloniidae
    Cercopidae
    Cicadellidae
    Cicadidae
    Delphacidae
    Dictyopharidae
    Flatidae
    Fulgoridae
    Issidae
    Membracidae

  Suborder: Sternorrhyncha
    Aleyrodidae
    Aphididae
    Asteroelecaniidae
    Coccidae
    Diaspidae
    Eriococcidae
    Eriosomatidae
    Kermisidae
    Margarodidae
    Psyllidae

  Suborder: Heteroptera
    Alydidae
    Anthocoridae
    Aradidae
    Belostomatidae
    Berytidae
Blissidae  
Cimicidae  
Coreidae  
Corididae  
Cydnidae  
Gelastocoridae  
Geocoridae  
Gerridae  
Hydrometridae  
Lygaeidae  
Miridae  
Nasuticorinae  
Nepidae  
Notonectidae  
Pachygronthidae  
Pentatomidae  
Plataspidae  
Pleidae  
Reduviidae  
Rhopalidae  
Rhyparochromatidae  
Scutelleridae  
Thyreocorinae  
Tingidae  

Chrysopidae  
Coniopterygidae  
Hemerobiidae  
Mantispidae  
Myrmelontidae  

Suborder: **Megaloptera**  
Corydalidae  
Sialidae  

Suborder: **Raphidioptera**  
Raphidiidae  

Note: Currently, the order Neuroptera is used in two different senses. In the broader sense it includes the familiar members, as well as Megaloptera and Raphidioptera. As a result, the three former orders (o.) are reduced to subordinal ranks (s.o.) within Neuroptera sensu lato as follows:  
o. Megaloptera = s.o. Megaloptera;  
o. Raphidioptera = s.o. Raphidioidea;  
o. Neuroptera = s.o. Planipennia.  
Each of the three orders is thought to form a natural (i.e., monophyletic) group, so this is simply a ranking issue.

**Coleoptera**

Suborder: **Archostemata**  
Cupedidae  
Micromalthidae  

Suborder: **Adephaga**  
Carabidae (incl. Cicindellidae, Rhysodidae, Paussidae)  
Dytiscidae  
Gyrinidae  
Halipidae  
Noteridae  

Suborder: **Polyphaga**  
Bostrichidae (incl. Lyctidae)  
Brentidae  
Buprestidae  
Cantharidae  
Chrysomelidae (incl. Bruchidae)  
Cerambycidae  
Cleridae  
Coccinellidae  
Curculionidae (incl. Scolytidae, Platypodidae)  

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**ENDOPTERYGOTA**  
(=**HOLOMETABOLA**)

**Neuroptera**  
Suborder: **Planipennia**  
Ascalaphidae
Dermestidae
Elateridae
Elmidae
Endomychidae
Erotylidae (incl. Languriidae)
Heteroceridae
Histeridae
Hydrophilidae
Lampyridae
Lucanidae
Lycidae
Meloidae
Melyridae
Mordellidae
Nitidulidae
Passalidae
Phalacridae
Phengodidae
Ptilodactylidae
Ptinidae (incl. Anobiidae)
Ripiphoridae (=Rhipiphoridae)
Scarabaeidae
Scirtidae (=Helodidae)
Silphidae
Staphylinidae (incl. Pselaphidae, Scaphidiidae)
Tenebrionidae (incl. Lagriidae, Alleculidae)

3) Scarabaeidae has been divided into many new families, including Bolboceratidae, Geotrupidae, Glaresidae, Hybosoridae, Pleocomidae, and Trogidae. The most familiar scarab groups (Scarabaeinae, Melolonthinae, Aphodiinae, Rutelinae, Dynastinae, and Cetoniinae) remain in Scarabaeidae though.

Strepsiptera
Stylopidae

Note: Strepsiptera was once considered to be a family (Stylopidae) of Coleoptera. The phylogenetic placement of this order is controversial. It is currently recognized at the ordinal level as the sister taxon to Coleoptera.

Mecoptera
Bittacidae
Meropeidae
Panorpidae

Siphonaptera

Diptera
Suborder: Nematocera
Bibionidae
Cecidomyiidae
Ceratopogonidae
Chironomidae
Culicidae
Mycetophilidae
Psychodidae
Ptychopteridae
Simuliidae
Tipulidae

Suborder: Brachycera
Asilidae
Bombyliidae
Calliphoridae
Diopsidae
Ephydridae
Hippoboscidae
Muscidae
Mydidae
Phoridae
Pyrgotidae
Rhagionidae
Sarcophagidae
Sepsidae

Notes:
The classification of Coleoptera has had much revision since T&J (2005). Many families were redefined by splitting or lumping to reflect phylogenetic relationships. Here are some of the more dramatic changes.

1) Curculionidae has been extensively redefined. Platypodidae and Scolytidae fall out as internal branches of the weevil evolutionary tree. They now are recognized as subfamilies (Scolytinae and Platypodinae) of Curculionidae. Other weevil groups were raised to familial-level status and removed from Curculionidae, including: Nemonychidae (pine flower weevils), Belidae (cycad weevils), Anthribidae (fungus weevils), Attelabidae (leaf rolling weevils), and Brentidae (straight snout weevils).

2) Staphylinidae now includes a few groups that were once recognized as separate families, including Pselaphidae, Scaphidiidae, Micropeplidae, and Dasyceridae.
Stratiomyidae
Syrphidae
Tabanidae
Tachinidae
Tephritidae

Trichoptera

Lepidoptera
Bombycidae
Cossidae
Crambidae
Drepanidae
Erebidae (incl. Arctiidae)
Geometridae
Hesperiidae
Lasiocampidae
Limacodidae
Lycaenidae
Noctuidae
Nymphalidae
Papilionidae
Pieridae
Psychidae
Pterophoridae
Pyralidae
Saturniidae (incl. Citheroniidae)
Sesiidae
Sphingidae
Tortricidae
Yponomeutidae

Suborder: Apocrita
Andrenidae
Apidae (incl. Anthophoridae, Xylocopidae, Bombidae)
Bethylidae
Braconidae
Chalcididae
Chrysididae
Colletidae
Cynipidae
Diapriidae
Dryinidae
Eucharitidae
Evaniiidae
Figitidae
Formicidae
Gasteruptiidae
Halictidae
Ichneumonidae
Megachilidae
Mutiliidae
Pelecimidae
Perilampidae
Pompilidae
Proctotrupidae
Rhopalosomatidae
Sapygidae
Scelionidae
Scoliidae
Sphecidae
Torymidae
Vespidae

Major family changes:
1) Erebidae now includes Arctiidae and Ctenuchidae.

2) Crambidae has been removed from Pyralidae and is now recognized at the family level.

3) Nymphalidae now includes Heliconidae, Morphidae, Danaidae, Satyridae, and Libytheidae.

Hymenoptera
Suborder: Symphyta
Cephidae
Cimbicidae
Pamphiliidae
Siricidae
Tenthredinidae

Suborder: Apocrita
Andrenidae
Apidae (incl. Anthophoridae, Xylocopidae, Bombidae)
Bethylidae
Braconidae
Chalcididae
Chrysididae
Colletidae
Cynipidae
Diapriidae
Dryinidae
Eucharitidae
Evaniiidae
Figitidae
Formicidae
Gasteruptiidae
Halictidae
Ichneumonidae
Megachilidae
Mutiliidae
Pelecimidae
Perilampidae
Pompilidae
Proctotrupidae
Rhopalosomatidae
Sapygidae
Scelionidae
Scoliidae
Sphecidae
Torymidae
Vespidae

Major family changes:
1) Apidae now includes Anthophoridae, Xylocopidae, and Bombidae.